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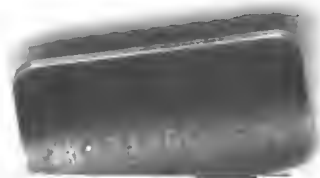
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PATHFINDER FORCING ITS WAY SOUTHWARD

ROADS that are such only in name will be the pathway of the Oldsmobile, that is persistently forcing its way southward, from now to the finish of its journey to the wind-swept Florida beach that connects fair Ormond with picturesque Daytona. Telegraph facilities in northwestern North Carolina may not be of the very best, but, barring mishaps, the Oldsmobile Pathfinder crossed Virginia-North Carolina line on New Year's Day. The last station was from a little railroad junction a few miles north of the border, not far from Danville, Va., one of the largest

towns in the Old Dominion, outside of Richmond. The message was confined to the five words: "Out all night. Heavy rain."

Contrary to precedent, however, the road for the greater part of the first end of the trip has been found to be uncommonly good for this season of the year. On the stretch from New York to Hagerstown, Md., but a few miles of poor road were encountered, though the going was more or less rough in places, owing to the freezing weather, as well as slippery occasionally from snow. This enabled a good pace to be maintained, an



CROSSING AN OLD-TIME BRIDGE OVER A HALF-FROZEN STREAM WEST OF HARRISBURG, PA.



PAYING THE PATHFINDER'S TOLL AT THE HARRISBURG BRIDGE OVER THE SUSQUEHANNA RIVER.

average of 110 miles a day having been made on this portion of the trip. The rolling character of the country, which is almost mountainous in parts, is one of the factors keeping down speed.

Progress Down the Valley of the Shenandoah.

The car left New York Sunday, December 23, the route lying through Philadelphia, Reading and Harrisburg, then by way of the battlefields of Gettysburg and Antietam, and down through the picturesque scenery of the Shenandoah Valley. The roads in the latter are good, and, although it is necessary to ford some of the streams, it is thought that this will become a favorite stamping ground for tourists, as soon as the necessary maps and information are published. Harrisonburg, Va., was reached on the 27th, after four days of steady driving, the trip of 109 miles from Hagerstown, Md., having been made through a severe storm of rain and hail. The total mileage to this point is 410, the tires still holding the air that was pumped into them at New York.

About forty miles outside of Hagerstown, a 25-foot creek had to be forded, and although the water reached within a few inches of the floor of the tonneau, the car went through without any trouble. The roads were so slippery that chains had to be used for sixty miles continuously.

Roanoke, Va., was reached Friday evening, after covering 120 miles of the worst roads encountered up to that time. Mountainous country, through which the roads were of heavy clay, made the going more or less difficult, though the scenery was the finest the party thus far had been treated to. Many points of interest were passed on the day's run, including the famous Natural Bridge. Upon leaving Roanoke, where a number of hours were lost owing to spring trouble, the party got its first taste of the battle that will have to be waged during the remainder of the journey. The roads were so muddy that it was difficult to average more than eight miles an hour, only 35 miles, most of which was done after dark, having been covered.

Struggling Through a Sea of Virginia Mud.

Saturday night found the party at Chatham, Va., which place was left behind early Sunday morning, and after struggling twelve miles through a sea of mud, Bedford Springs was reached, where the gasoline supply was replenished. From the latter point the same kind of going was encountered to Leesville, where it was found necessary to make repairs on an old barge before the car could be trusted to it, in order to ferry it across the Staunton river. On leaving the barge, the car mired on the river bank, and as it was already dark and raining heavily, the night was spent in it. In one place it was necessary to run for half a mile up the bed of a stream two feet deep, in order to reach the road again. Owing to the difficulties encountered, the mileage for two days and one night was only fifty-eight, bringing the total since leaving New York up to 612 miles.

R. H. Johnston, in a White steamer, was met near Harrisonburg, Va., which gave rise to the report that he also was making the trip to Florida. This was not the case, however, as Mr. Johnston was merely on a holiday trip, again starting northward after having met Mr. Owen and his party at the ford in the Shenandoah Valley stream, shown on opposite page.



THE "YANKS" "CAPTURE" A CONFEDERATE CANNON ON THE BATTLEFIELD OF GETTYSBURG.

MORE ABOUT FLORIDA TRIP.

By A. L. WESTGARD.

The article which appeared in THE AUTOMOBILE, November 15, and which gave a preliminary survey of an automobile route to Florida, has attracted considerable attention in the South. One native of Tennessee points out that the roads in the eastern part of his State are "certainly very bad" during a large portion of the year; and, besides, the lack of bridges would necessitate the fording of many streams, a task impossible except in dry weather. Yet it is reported that a party has set out from Minneapolis and intends to traverse eastern Tennessee.

It is also reported that a Boston man "has formulated a plan to establish a highway between the Hub and Atlanta, following the coast the greater part of the way south." While "following the coast" seems a little far-fetched, it has developed upon investigation among autoists who have been in the Carolinas and Georgia that a couple of feasible routes might be mapped out through the red sand country of these States, thus avoiding the route laid through eastern Tennessee.

One route could follow for the major part the one laid out to the Jamestown Exposition at Norfolk and which is being urged for next year's A. A. A. tour for the Glidden trophy. It would follow the Exposition Route's itinerary from New York through Philadelphia, Reading, Harrisburg, Gettysburg, Pa., Hagerstown, Md., and down the Shenandoah Valley to Staunton, Va., up to which point will be found pikes in fair conditions, with innumerable toll gates. Thence leaving the valley, it would cut across easterly over clayey, but on the whole not bad, roads to Richmond, or, if the weather was dry, take the much shorter way south from Philadelphia through Baltimore, Washington and Fredericksburg to Richmond. This route, covering roads not nearly as good as the longer one above, passes through a flat, uninteresting country. Continuing south from Richmond, it would pass through Peters-



WHERE JOHN BROWN WAS TRIED AT HARPER'S FERRY.

burg—at which place it leaves the Exposition Route—Emporia, Va., Halifax, Wilson, Smithfield, Fayetteville and Pembroke, N. C., to Florence, S. C., thence through Sumter, Orangeburg and Bamberg, S. C., to Savannah, Ga., a distance of about 1,030 miles from New York.

Another route could follow the Shenandoah Valley to Staunton and south to Lexington, Va., thence through Roanoke and Martinsville, Va., Winston-Salem, Mocksville and Charlotte, N. C., Chester, Winsboro and Columbia, S. C., Augusta and Waynesboro, Ga., to Savannah, a distance of about 1,040 miles from New York. The territory from Augusta to Savannah is apt to prove itself full of difficulties. From Savannah to Jacksonville, Fla., about 140 miles, there are several stretches of fine



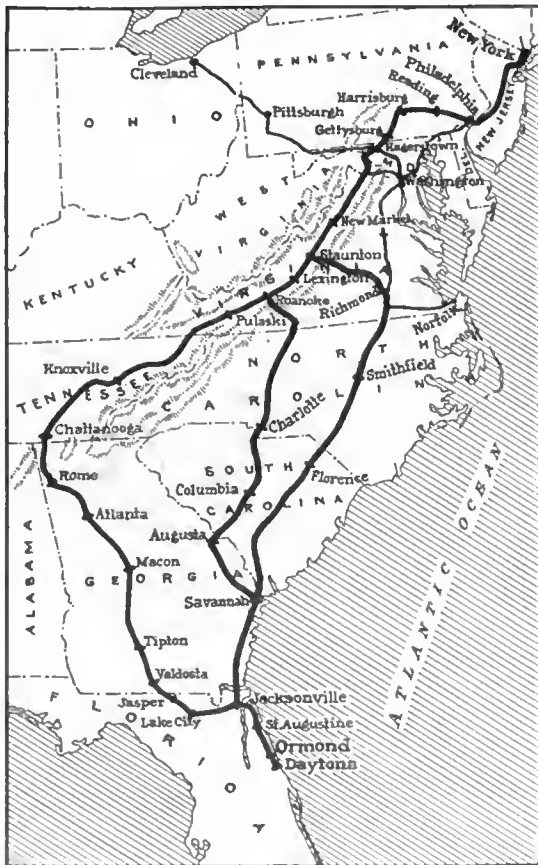
FOUR FEET DEEP FORD IN THE SHENANDOAH VALLEY NEAR HARRISONBURG, VA., WHERE THE OLDSMOBILE AND WHITE STEAMER EXCHANGED GREETINGS.

shell roads and the going ought to be comfortable. As pointed out in the former article, above mentioned, the road from Jacksonville south to Ormond and Daytona, via Pablo Beach and St. Augustine, though sandy and bad in places, has often been covered by automobiles.

The roads through the red sand districts of the Carolinas and Georgia are uniformly good in all kinds of weather, but both routes above given traverse great swampy areas where many detours will undoubtedly become necessary. It is well also to point out that hotels are far between and for long stretches entirely absent, a fact that to a great extent is offset by the generous hospitality of the natives. If one appreciates scenery and does not mind the hardships attendant upon the lack of hotel accommodations, one will certainly enjoy the run through the historic Virginia valley.

The Florida people have become thoroughly aroused to the importance of good roads, and it is intended to employ convict labor to build them, such means being already used in Dade county. The natives realize that since the ascendancy of the automobile, in order to bring a large number of people of means to the State to enjoy its climate—and incidentally to spend their money—they must make it attractive as viewed from the standpoint of an automobile tourist. To no other State in the Union do good roads mean so much as to Florida.

A good beginning has been made, as shown by the excellent clay and marl road just completed from Daytona through DeLand, Sanford and Orlando to Kissimmee, a distance of 75 miles. A new road is also reported as being built from Orlando to Ocala, 65 miles. No doubt that the good work just started will continue and that in, let us hope, the reasonably near future, one will be able to enjoy many extended trips from the winter resorts of the charming State. It is up to the natives to provide the surface; the Northern tourist will do the rest.



THREE ROUTES THAT LEAD TO FLORIDA.

The Oldsmobile Pathfinder that is now en route, is taking the central route from Roanoke to Savannah.



A CORNER IN THE AERO CLUB EXHIBIT AT THE RECENT GRAND CENTRAL PALACE SHOW.

ST. LOUIS SELECTED AS STARTING PLACE.

St. Louis, Mo., January 1.—As the result of a trial ascension made from here to-day in the balloon *L'Orient*, which, after an uneventful trip of several hours, safely landed at Cliffdale, Ill., the special committee consisting of Courtland F. Bishop, Augustus Post, Alan R. Hawley, J. C. McCoy, Frank S. Lahm and Leo Stevens, who came here especially for the purpose of ascertaining if the gas supply were satisfactory for a large event, were unanimous in their selection of St. Louis as the starting point of next year's big balloon race, which is to be held in October.

The balloon was inflated at the yards of the Laclede Gas Light Company, at Second and Rutger streets, and a large crowd gathered to witness the ascension. When the guy ropes were released, the 35,000 foot gas bag rose gracefully in the air until it reached an altitude of about 1,000 feet, when it started to drift slowly toward the west. Alan R. Hawley and J. C. McCoy made the ascension, though they offered to step down in favor of David R. Francis and L. D. Dozier, president of the St. Louis Aero Club, who appeared just as the preparations were completed. The latter, however, declined the honor. When the aeronauts had not been heard from at 10 p.m. telegrams were sent to a number of surrounding towns, but nothing had been seen of the balloon. A wire was later received from Cliffdale, Ill., telling of the safe arrival at that point. The highest altitude reached was 2,100 feet, the earth being invisible most of the time owing to the clouds.

So pleased was the committee with the conditions that it was decided not to visit other cities. The Common Council has set aside a plot of ground adjoining the gas works for the use of the aeronauts. The choice of St. Louis is particularly appropriate, as it was from that city that the start was made nearly half a century ago, resulting in the world's long-distance record that stood until beaten by Count de la Vaux six years ago.

FIRST CONTEST FOR LAHM CUP.

In order to foster interest in aeronautical matters, as well as to commemorate the victory of Lieut. Frank P. Lahm, U. S. N., over foreign aeronauts in the race for the International Cup, the Aero Club of America has decided to offer a trophy for aeronautic races in the United States, the first of which is to be held in connection with the Jamestown Exposition next year. The conditions provide that the first winner of the cup must exceed Lieut. Lahm's record of 402 miles, and each succeeding winner must succeed the record of the previous holder in order to gain it. The Exposition was selected for the first contest, as the Aero Club intends to hold an aeronautic congress in connection with it, at which many of the machines shown will be tested by the government.

IN THE PINES OF NEW JERSEY.

LAKESWOOD, N. J., Jan. 1.—Only 72 miles separates the metropolitan autoist from the heart of the Jersey pine country where automobiling at this time of year is a most pleasurable and exhilarating pastime. In order to appreciate the climatic difference to be obtained by the comfortable run of several hours from New York City one should leave Manhattan Borough in disagreeable weather and note the gradual change as he progresses towards Lakewood. It is only eight miles from New York City to Newark, and thence the route—fully described in "THE AUTOMOBILE Official A. A. A. Blue Book"—is through Elizabeth, Rahway, Metuchen, New Brunswick, Old Bridge, Bloomfield, Spotswood, Helmetta, Jamesburg, Englishtown, passing the Monmouth battleground, thence to Freehold with its military academy, next through Turkey, Ardena, Farmingdale, Lower



A MAXWELL PARTY IN THE PINES NEAR LAKEWOOD.

Squankum, and in a direct line to Lakewood. The road is generally good and sometimes really excellent. Lakewood being the most fashionable of the Northern winter resorts, possesses several magnificent hotels and also Georgian Court, the palatial residence of George Gould, who has constructed a country place costing several millions. John Rockefeller is another frequent Lakewood resident and his golf proclivities make him a familiar figure. The name of Mr. Rockefeller was last week added to the list of notable men who have taken out automobile licenses in the State of New Jersey.

One can return from Lakewood by going to Point Pleasant over one of the best eight-mile stretches of road in New Jersey, thence taking the Ocean Road as far as Seabright, and thence traversing the famous Rumsen Road to Redbank, and go through Middletown, Keyport, Mattewan and Frenault, reaching Old Bridge, whence the down route would be duplicated.

Though there has been considerable criticism of the present New Jersey automobile law, it is anticipated that the coming



CROSSING THE BRIDGE OVER GEORGIAN COURT.

Legislature will make some needy changes that will disarm much of the criticism met with since the Frelinghuysen measure went into effect. New Jersey has the roads and New Jersey intends to build more of the same kind, and if necessary use a different form of construction for the use of the automobile, which even country folk are beginning to realize has come to stay and will be a blessing and convenience to mankind in general.

ALCOHOL TEST PROVED AN EVENTFUL TRIP.

PHILADELPHIA, Jan. 1.—Owing to a delay occasioned almost at the very outset of the trip, by breaking the front axle and a spring through a loose plank wedging in the running gear midway between Jersey City and Newark, Joe Tracy and the Dragon did not reach Philadelphia on the alcohol test run until late last night. The accident occurred at 1:15 A.M., and was due to the fog and rain. A loose section of the plank road sent the car flying into the air, and had Tracy not been proceeding cautiously the mishap might have been serious. Repairs were not effected until Rahway was reached, the road having been lost twice in the meantime. Thirteen gallons of denatured alcohol were consumed on the run of more than 100 miles. Under the old law this would have cost \$35.10, or less the tax \$7.15. About six gallons of gasoline would have been required for the run at a cost of \$1.20.

FAST AUTOS FOR FLORIDA MEET.

H. N. Harding has been selected to drive the new 110-horsepower Oldsmobile in the coming Ormond-Daytona meet. Since the death of Ernest Keeler, at Point Breeze track, Philadelphia, the Oldsmobile people have been looking for a good driver, and Harding's selection probably means he will do all their driving in 1907. Walter Christie is working on a new racer for the Florida meet and hopes to have same in readiness for that event. Two Wayne machines, a 35-horsepower and a 50-horsepower, have been entered by A. L. Kull, New York agent. Arthur Duray, the noted French driver, will compete with his 130-180-horsepower De Dietrich.



THE LAKE IS A SCENE OF GREAT ACTIVITY IN WINTER.

FLOOR PLANS OF THE COMING GARDEN SHOW

SUPPLEMENTING the alphabetical list of exhibitors and the numbers of the spaces that they will occupy when holding forth at the Seventh National Automobile Show, which will occupy the Garden during the week of the 12-19 of the present month, which was published in *THE AUTOMOBILE* last week, diagrams of the various floors showing the exact locations of the various spaces as well as the grouping of the exhibits into classes are shown.

Time-honored arrangements that have prevailed in the past hold good and the imported cars will, as usual, be centered in the restaurant at the right of the main entrance. Commercial vehicles will occupy the basement and sundries and accessories will be found along the balconies and galleries, except that the visitor will have to mount further heavenward this year than ever before, in order to arrive at the level of the first accessory exhibits, for, as announced some time ago, the pressing demand for space in which to exhibit cars has been met in a measure by building an extended platform over the tier of boxes.



"PROSPERITY."

A Garden Show Statue.

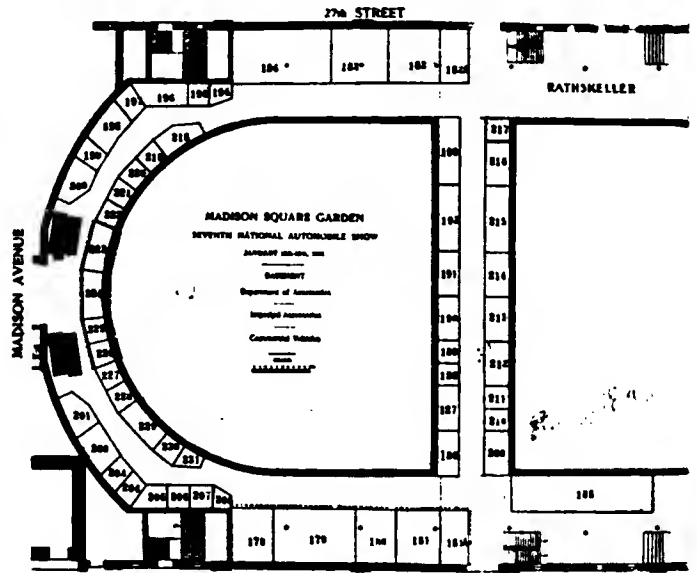
This will be devoted entirely to showing cars, which will naturally be of the lighter weight touring car and runabout types.

What the Show Will Reveal.

Although a number of the 1907 models were not only completed some time ago, but have been sold to purchasers and are running on the roads, it is a matter of common knowledge that a majority of the makers have something or other "up their sleeves" which will not be uncovered until the cars are staged at the show. And though it is well understood that little of radical design is to be looked for, there has been more or less secretiveness regarding just what form the novelties will appear in. Many new things in the shape of detailed changes and improvements in many parts of the car are promised, and while the latter must of necessity be confined to things that make no perceptible difference in the machine in the great majority of instances, those who go looking for novelty will be able to find plenty of it.

There is little doubt but that the combination gasoline-electric chassis of the Electric Vehicle Company will prove the drawing

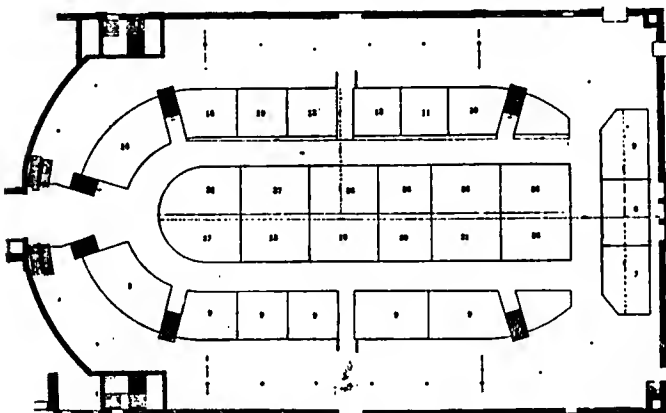
card of the show, while under the head of attractions, the official press agent mentions a "waterless" fire engine—in other words, a motor fire engine with an air-cooled motor. No new adherents to the six-cylinder principle have made themselves known since last year, so that there will be the same number of multi-cylindere cars of this type in evidence as previously, except that there will be shown a six-cylinder car that has but three cylinders—a two-cycle motor, which is put forth as a substitute for six cylinders of the four-cycle type. The makers of the Pope-Toledo represent one of the few instances in which standards of design have been totally abandoned, their motor having undergone a complete process of revolutionizing during the past year. In accordance



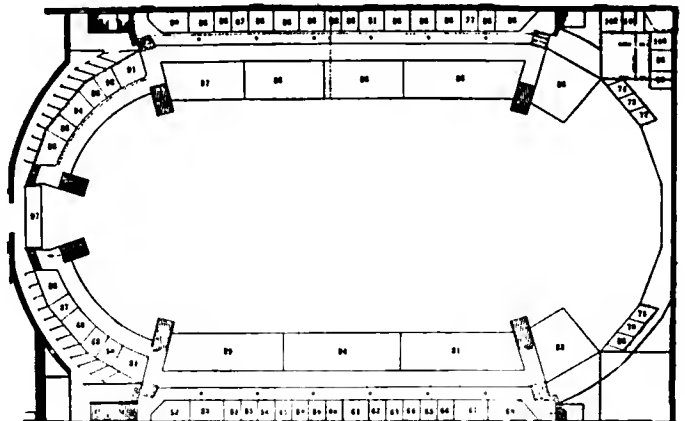
WHERE THE COMMERCIAL VEHICLES WILL BE SHOWN.

with the latest practice it will have both valves in the head, and though the opposite disposition has been retained, but a single camshaft is employed, working through a walking beam type of valve-operating gear. Motor design, where valve placing and operation are concerned, is something that has come in for considerable attention and it is anticipated that its influence will be in evidence on other motors.

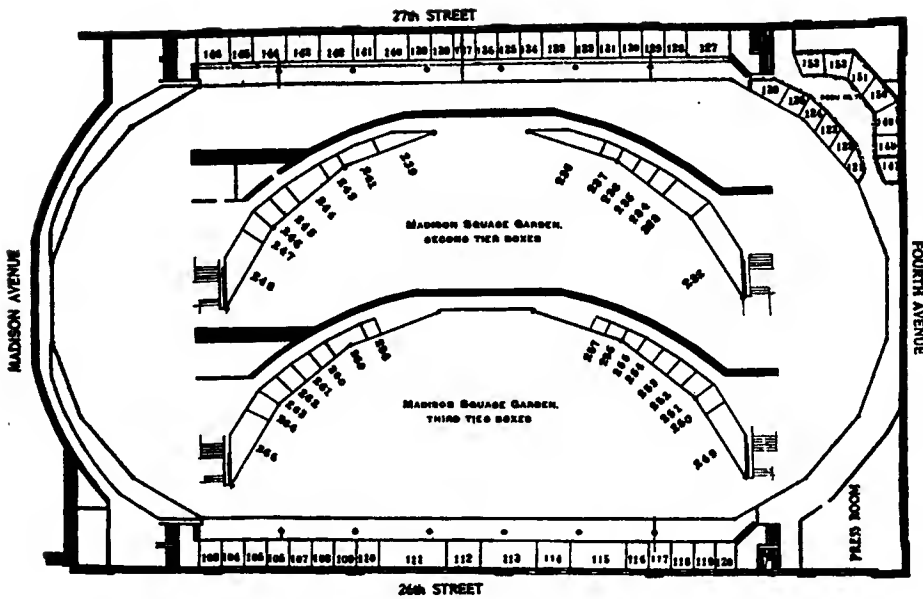
The question of offsetting the cylinders on the crankcase in order to reduce the pressure and consequent friction on the power stroke of the motor is another matter that has received no little attention. The Winton motor represents one of the most prominent adherents to this standard and doubtless others may be



HOW THE MAIN FLOOR WILL BE APPORTIONED.



ELEVATED PLATFORM AND MEZZANINE FLOOR



ALLOTMENTS FOR THE GALLERY; ALSO SECOND AND THIRD TIER BOXES.

looked for. As usual, changes and improvements will be confined for the most part to matters of detail and it is said that more or less novelty is to be looked for in carbureters.

SPACE ALL SOLD FOR THE BOSTON SHOW.

BOSTON, Dec. 31.—Though the Boston show is two months and a half away, the old cry has arisen that the space is all gone, and the manager and show committee of the Boston Automobile Dealers' Association are having difficulty in finding places for all the applicants for space. In Mechanics building and Horticultural hall, which are engaged for the show, the committee had available 105,000 square feet of space. This has been allotted, and if many more applications are received the committee will be forced to take another building. Such a building is available in a new garage that is being erected near Mechanics building, and if this is leased the committee will have 30,000 additional feet of space. At the present time the side walls of the corridors in Mechanics building are being sold to accessories manufacturers who could not secure floor space. Manager Chester I. Campbell has not yet

announced the decorative scheme for this year's show, but he promises that it will be more elaborate and complete than ever before. He is to make a trip next week, during which he probably will close the contracts for the decorations. The show promises to be more complete than its predecessors in every department. There will be not only a greater number of cars, but a larger number of exhibitors of accessories, and the power boat department in the basement will include a larger number of boats than it has in previous years. The commercial vehicle department is also to be larger and more comprehensive.

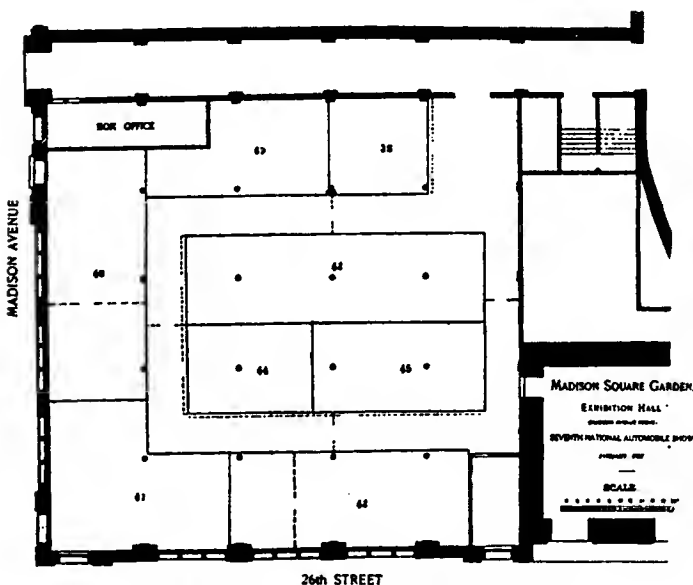
A VETERAN'S VIEWS.

Col. George Pope, who was "among those present" at the beginning of the bicycle manufacturing industry and again when automobiles were first made, says, among other things: "In years gone by, when the old guard makers were new in

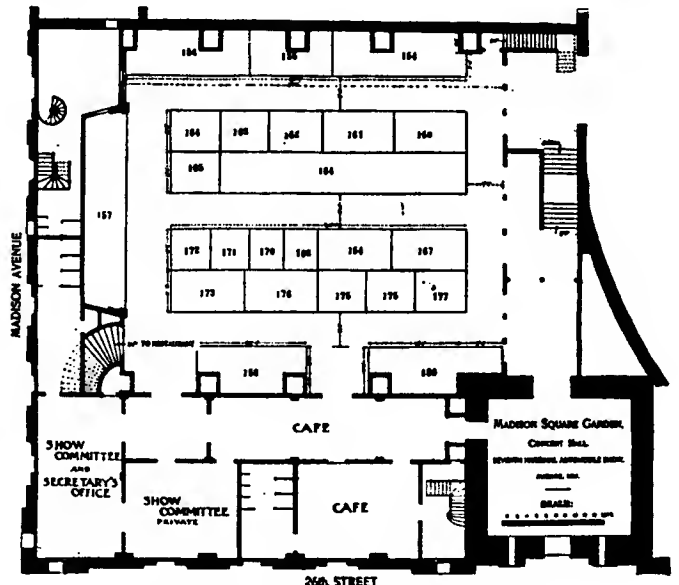
the field and were looking for dealers to handle their product, the national show was largely a trade event, to which the manufacturers went seeking to do business with retailers. Now the old established manufacturers all have their regular line of dealers and the orders from these are booked in the fall. They do not go to the show to engage dealers to handle their output, because they are already supplied in this respect. They go to display the new models to the public, and the show, from being a purely trade event, has become a sort of festival for society and the automobiling class."

PHILADELPHIA'S SHOW OPENS JANUARY 5.

PHILADELPHIA, Jan. 1.—With a score of applicants for space entirely unprovided for, and with the half-hundred or more lucky ones who were able to crowd in inadequately provided for, the annual show of the Philadelphia Automobiling Trade Association opens in the First Regiment Armory next Saturday evening, January 5. Despite this fact, the show promises to be the most successful ever held in the Quaker City.



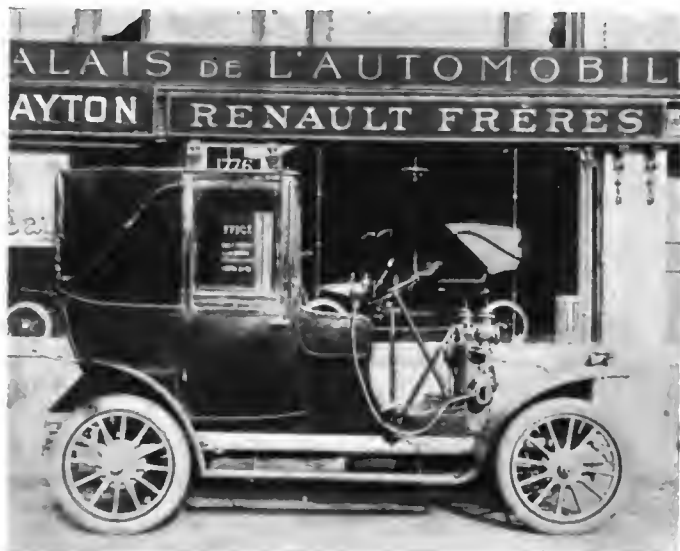
EXHIBITION HALL SPACES ON MAIN FLOOR.



CONCERT HALL AND ITS APPORTIONMENT.

AUTO CABS IN PARIS.

PARIS, Dec. 20.—It was not until this year that automobiles for the people came into general use in Paris. For a long time there had been a miscellaneous collection of vehicles around the Opera House in which, for as high a price as the driver could obtain, you might have a run around town or make a journey to the seaside—if the motor was capable of it.



FIRST OF THE RENAULT CABS TO REACH NEW YORK.

Paul Lacroix, manager of the Renault Frères Selling Branch, states that arrangements have been practically completed for the formation of an American company which expects to have Renault cabs running in New York City before the end of the year. The cab above pictured is the first one to reach this country, and it has attracted much attention in the Metropolis.

At the end of 1905 a company placed on the streets a number of taximeter cabs, the chassis of which were specially designed and built for town service by Renault Frères. From the first day the venture was a success. No sooner were the 250 Renaults in circulation and doing good business than other firms undertook the construction of machines for this work. At the present moment Bayard-Clément has 200 cabs on order, ten of which are at present on the road. The Darracq factory is building 1,100 chassis for cab work, 800 of which will go to London and 300 remain in Paris. Panhard has a small number in circulation and is building more. Other firms at present building or having finished cabs for Paris are Chenard & Walcker, Georges Richard, maker of the "Unic," Mendelssohn and Tony-Huber. At present the number of cabs in use is about 400, Renaults largely predominating. At the end of 1907 at least 1,500 automobile cabs will be in circulation in Paris.

The rate in Paris is 15 cents for a distance of 984 yards, every additional 328 yards being charged two cents. At night and for journeys outside the city there is a slightly increased tariff. The drivers, many of whom are men previously in charge of horse cabs, are paid a percentage on their takings: 15 per cent. on the part of their earnings below \$6; 20 per cent. on the part of their earnings from \$6 to \$8; 25 per cent. on the part of their earnings from \$8 to \$10; 30 per cent. on the earnings above \$10. Taking \$9 a day as his average receipts, the driver gains \$1.65 a day, to which must be added his tips and a slight percentage earned on gasoline. Each driver buys his own gasoline and is allowed by the company 15 per cent. of his total earnings for this purpose. Generally the driver obtains a slight advantage by this arrangement, the tariff being calculated on average running.

The driver's wages and gasoline paid, an average of 30 fr. 50c. per day and per car remains for the company. Ten centimes (two cents) per kilometer is calculated as the average tire expense, and as each cab runs 130 kilometers a day, 13 francs have to be deducted, leaving 16 fr. 50c. per car. Depreciation is worked

out on a three years' basis, with 300 running days in a year. The price of a cab being 7,500 francs (\$1,500), the amount to be written off is 8 francs per day, bringing the profit down to 8 fr. 50 c. Garage charges, accessories, insurance, etc., take away 3 fr. 50 c., leaving a net profit of 5 francs (\$1) per cab per day.

The Renault chassis supplied to the cab company are in their main lines similar to the firm's standard models, with simplifications rendered necessary by the arduous service they have to undergo. The length of the chassis is 137 inches; wheel-base 100 inches; length for bodywork from dashboard to rear, 96 inches. The track is 51 inches, and the width of chassis 31 inches. Pressed steel frame of the usual channel section, supported on four longitudinal semielliptic springs and one transverse rear spring. The engine, which is carried forward, under the familiar type of Renault bonnet, with dashboard forming radiator, consists of one pair of cylinders 2.95 inches bore and 4.7 inches stroke, rated at 8 horsepower. The most important modification of the ordinary model is the total absence of controlling levers on the steering wheel. There are two foot pedals, the left-hand one operating the clutch and brake on the differential and the right-hand one the accelerator. On the dashboard is a small regulator controlling both the gas and spark, and by means of which exceedingly slow speeds can be obtained. Three forward speeds and reverse of the selective sliding type operated from a single lever, give 5, 9 and 21 1-2 miles an hour. Transmission is of the usual Renault pattern by cardan shaft to rear live axle. Five and three-quarter gallons of gasoline are carried in tanks under the driver's seat, this supply being more than sufficient for a day's work. Gasoline is supplied to the carburetor by gravity feed, and the water circulation is by thermo-syphon. Every effort has been made to produce the simplest possible design, and in this the manufacturers have admirably succeeded. Slight repairs, such as the changing of a tire, ignition troubles, and the like, are attended to by the mechanic himself.

Though elegant in design, the bodywork of the automobile cabs is exceedingly simple. It is constructed by the Company Rhéda, of Levallois, near Paris, and consists of landaulet with folding seat, the rear seat accommodating three and the folding seat two persons. In one minute the top and sides can be folded down, making an open carriage with glass screen between driver and passengers. All the glass windows can be lowered into pockets.



TWO-CYLINDER RENAULT ENGINE OF 8-HORSEPOWER.

FRENCH GRAND PRIX NOT YET SELECTED

PARIS, Dec. 20.—A circuit has not yet been discovered for the Grand Prix of the Automobile Club of France, to be run between June 25 and July 8. Neither of the two circuits in the Fontainebleau has been found suitable for the race owing to narrowness at certain points. A short circuit has been definitely decided upon, but its width must never fall below 22 feet. Several portions of the proposed Fontainebleau circuit only give 20 feet in width without any possibility of widening.

Why One Newspaper Opposes Racing.

The anti-racing campaign has again broken out in a certain section of the French press. *Le Matin*, a daily newspaper of considerable political importance, re-opened the attack yesterday by a violent attack on racing in general and the Grand Prix of the A. C. F. in particular, and terminated by declaring that the Government would not accord the necessary permission for the holding of the race next year. Replies from racing partisans have come forth with promptitude, several journals hinting that *Le Matin's* antipathy to racing only took form when the principal French firm refused to take part in that paper's self-advertising touring contest. A revelation of the personal motives animating the militant non-racers is promised and the squabble may become bitter.

The declaration that the Government will not accord permission for the holding of the race is more of a desire than a reality. No such opinion can have been expressed by any official, for the simple reason that the A. C. F. has not yet given notice of its desire to hold a race. During his visit to the Salon, M. Clemenceau, president of the Council, discussed the question of the Grand Prix with the heads of several important firms, and

showed himself very liberally disposed. In due time the A. C. F. will ask for official permission to hold its race and there is every probability that it will be accorded without serious objection.

Hemery No Longer a Darracq Driver.

Hemery, the 1905 winner of the Vanderbilt Cup, has left the Darracq firm and signed an engagement to drive in speed contests for Tourand & Cie., of Suresnes. Since his last visit to America the dare-devil Darracq driver has not had much success in speed contests, and when a conductor had to be chosen for the 1906 Vanderbilt race, Hemery was sidetracked in favor of his companion, Wagner, who had run up a better speed record during the preceding six months. It is said this setback decided Hemery to quit the firm for which he had won so much glory.

THE RACE FOR THE EMPEROR'S CUP.

BERLIN, Dec. 20.—The Taunus Cup race will take place on June 14, when it is hoped that at least sixty cars will assemble. France and Italy have promised numerous entries, December 31 the lists will be closed. There has been some grumbling about the short period between the issue of regulations and the closing of the entries, but this will give the firms more time to prepare. Up to date of writing Germany is represented by Horch, Opel and Benz, each with a full team of three cars.

Italy is very much in sympathy with the event and has adopted the weight and cylinder capacity limits for the Florio Cup, at the same time stating that the Italian A. C. will not be officially represented in the French Grand Prix. This is quite a feather in Germany's cap.

NOT MUCH DONE AT INTERNATIONAL CLUB CONGRESS

PARIS, Dec. 20.—There was little business of importance at the International Congress of Automobile Clubs, held at the Automobile Club of France this week. Delegates attended from every European country, and America was represented by J. Howard Johnston and William S. Hogan.

In view of the efforts made by the Automobile Club of Switzerland to abolish the numerous petty tyrannies to which autoists have been subjected in that country, it was decided to suspend the boycotting carried on for the past year. In future complaints will be made to the Automobile Club of Switzerland and that body will make inquiries and do everything possible to safeguard the rights of automobile tourists.

Dates Decided Upon for European Events by the International Congress.

Feb. 16.....—Turin Exhibition.
 Feb. 23-26.....—A. C. Italy, Volturette Contest.
 March 20-27....—A. C. Nice, Automobile Week.
 April 2-15.....—Monaco Meeting (Autoboats).
 April 1-15.....—Spring Wheel Competition.
 April 15-30....—Nautical Club of Nice (Auto and Sailing Boats).
 April 18-20....—Targa Florio.
 April 25-28....—A. C. of Touraine, Touring Competition.
 April 28.....—Château-Thierry Hill Climb.
 May 1-15.....—Paris-Madrid Touring Competition and Madrid Automobile Exhibition.
 May 24-27.....—A. C. of Austria, Volturette Contest.
 May 15-31.....—A. C. of Siene and Olse, Wheel Competition.
 May 15-31.....—A. C. of the North, Industrial Vehicle Competition.
 May 31.....—A. C. of Auvergne, Rochet Schneider Cup.
 June 1-4.....—A. C. of Bordeaux, Autoboat Meeting.
 June 8-12.....—Herkomer Cup.
 June 8-12.....—Electric Vehicle Competition (Paris).
 June 14.....—German Emperor's Cup (Taunus Circuit).
 June 15-28.....—Kiel Autoboat Exhibition and Races.

In view of difficulties arising from the diversity of regulations for speed contests—the Grand Prix, the German Emperor's Cup, and the Brescia circuit all being run on totally different lines—the German club proposed a unification of regulations. For 1907 this is impossible, but a new formula will be drawn up and presented at the next congress, to be held on June 15 at Hamburg, on the occasion of the race for the German Emperor's Cup. At the same meeting the question of dates of the different automobile exhibitions will be discussed with a view to obviate clashing of interests. In future the members of the congress will meet twice a year, in December at the A. C. F., and in some other country during the summer.

June 25-July 8.—Grand Prix of A. C. F. (Exact date has yet to be decided upon.)
 July 7-10.....—A. C. of Bordeaux, Touring Competition.
 July 15-18.....—Ostend Week.
 July 19-22.....—A. C. of the North, Baron de Caters' Cup and Leopold Cup.
 July 25-30.....—Belgium Criterium.
 August 2-13....—Auvergne Cup.
 August 14.....—A. C. of Austria (Autoboats).
 August 18-22...—Ardennes Circuit and Coupe de Liedekerke.
 August 23-26...—Ostend Week (Autoboats and Cars).
 Sept. 1.....—Florio Cup on Brescia Circuit.
 Aug. 30-Sept. 3.—Evian Autoboat Meeting.
 Sept. 5-15.....—Arcachon Autoboat Week.
 Sept. 12.....—A. C. of Salon, Speed Contests.
 Sept. 14-15....—Mont Ventoux Hill Climb.
 Sept. 15.....—Semmering Hill Climb.
 Oct. 6.....—Autoboats at Maisons Laffitte.
 Oct. 13.....—Dourdan Kilometer Speed Tests.
 Oct. 20.....—Gaillon Hill Climb.
 Nov. 1-15.....—Volturette Contest near Paris.

REMEDIES FOR ROADSIDE PERPLEXITIES

By THE MAN AT THE WHEEL.

IT is well for the autoist who takes pleasure in grooming his own car, and prides himself on being equal to every emergency, to realize that every case of missed explosions in the motor is not due to either ignition or carbureter trouble. The chances are many to one that one or the other of these is at fault; however, as it has been figured that of the total number of stoppages to which a motor is subject, the ignition is responsible for something like 50 per cent. and the carburetion, in which is included other essentials of the fuel supply than the carbureter itself, 40 per cent. on the average, leaving but 10 per cent. to be accounted for by all other troubles of whatever nature. And one of these other troubles that will produce symptoms so nearly akin to those indicating ignition or carbureter ills as to invariably lead the search in their direction can frequently be traced to a leaking inlet valve. No better illustration of this can be cited than the case of a high-powered car which persistently missed despite every effort to locate trouble in the ignition system or the carbureter. Every test proved them to be working at their best, so the valves were finally removed, and it was found that the inlet valve of cylinder number three had quite a piece chipped out of its edge, causing it to leak badly. This permitted the gas under compression to be forced back through the manifold and out through the main air intake of the carbureter. Consequently cylinder number two, which was next in order to fire, did not receive any charge and missed fire. At times number three would force most of the charge out through the hole in the valve so that it would also miss, causing the latter to apparently jump to different parts of the engine in an extremely puzzling manner.

One of the Causes of Lost Power.

Few things are more puzzling to figure out for the driver whose experience does not date back very far than a motor that will run perfectly at low speeds, but which begins to sputter, misfire and choke the moment an attempt is made to accelerate it. The symptoms are indicative of carbureter trouble, and anyone who recalls his experience with the old time non-compensating carbureters, in which it was necessary to alter the amount of air given for every change of motor speed, does not have to puzzle very long as to the cause. On the other hand, a driver whose experience has been entirely with the present-day automatic carbureters, in which adjustment is practically confined to giving the needle valve a turn one way or the other in order to alter the amount of fuel entering the nozzle, does not find the problem so easy of solution. Traveling along a country road not long ago the writer came across a driver who found himself in this situation. He had been going along smoothly at a good pace, up hill and down dale, when suddenly the motor seemed to go into a tantrum. It sputtered, popped and "laid down." The first twist at the crank set it running again as smoothly as ever, and the driver resumed his seat preparatory to getting under way, feeling much relieved that things were not half as bad as the symptoms seemed to promise. But he was doomed to disappointment, for the moment he tried to speed up the engine and let in the clutch the same performance was repeated, and the engine stalled. He had been going through this process for half an hour or more when we came along, and the impatience of the people he was driving had about reached a point where they were tempted to walk to the nearest railroad station and continue their journey that way. The helpless, exasperated look of the chauffeur would have been enough to melt the heart of the autoist least inclined to render assistance had the passengers not actually signaled us to stop. Of course, they were of the opinion that the case was utterly hopeless and merely wished the favor of a lift to the station, while the chauffeur thought of nothing but a tow. Before we did either an investigation

was undertaken, and the motor having duly displayed its symptoms at the beck of the chauffeur for our benefit, the carbureter was tackled. The trouble was apparent even without dismantling it. A spring controlled plate closed the opening of the auxiliary air inlet, and, under ordinary conditions, its adjustment should have been such as to cause it to yield to the slightest touch of the finger; but, as it was, poking it with a pencil end failed to disturb it. It had jammed tightly on its seat, with the result that when the motor speeded up the mixture became so rich that the engine could not possibly run on it. An unusual bump had unseated the spring and caused it to bind against the side wall of the intake, and as soon as this was set right there was no further trouble with it.

Poor Adjustment Weakens the Motor.

It is one of the peculiarities of the automobile motor that it will very frequently run perfectly, or apparently so, at a low speed, sometimes even carrying the load well on low gear, and all but refusing to perform when a higher speed is attempted or the direct drive is employed. Next to having the engine in perfect running order, while a break in some one of the links of the transmission prevents progress, there are few things more exasperating than being compelled to crawl along at six or eight miles an hour on the low gear with the engine running as if it would shake itself off the car. Such a state of affairs is usually considered to be indicative of about as small an amount of skill in driving as a man can possibly possess and still manage to run a car. In the great majority of cases it can be traced to the coil vibrators and the sluggishness of the latter can, in turn, be laid to the battery in many instances. It is safe to say that in nine cases out of ten the coil vibrators are adjusted so as to take anywhere from one to three times as much current as is actually needed to run the engine up to its maximum. In other words, two-thirds of the current is usually wasted, and still many autoists condemn their batteries because the mileage obtainable from a charge is so small. As soon as the battery falls off a bit there is not sufficient current to start the vibrator working as quickly as it should, and in consequence the coil works sluggishly. It lags, and no matter how far the time of ignition is advanced, the charge is, in reality, not being fired until much later in the stroke, which readily accounts for the loss of power. With a motor turning over at the rate of 1,000 r. p. m., but .03 of a second are required to complete the power stroke in each cylinder so that the time element becomes of extreme importance. It is easy to realize that no matter how small a fraction of a second the vibrator lags behind the moment of contact at the timer, this is bound to exert considerable influence on the time that the explosion occurs in the cylinder. The vibrators should always be adjusted with the engine running, and, if possible, with the aid of a low-reading ammeter; that is, one on which the dial is calibrated into easily readable fractions of an ampere. The fluctuations of current are so violent, however, that an accurate reading will only be possible by holding the vibrator down momentarily. This will give a higher reading than the amount of current actually used, but will be valuable as a comparison.

Some Things Worth Remembering.

A sudden and complete stopping of the motor points a break in the ignition system almost invariably; gradual slowing down and weakening of the motor may be due to either the ignition or failure of the fuel supply, while spasmodic running is most often caused by the former. These and a few other fundamental principles of like nature if constantly borne in mind will frequently be the cause of being able to put your hand right on the trouble.

TIRES, PATENT RIMS, AND WHEELS AT THE SALON

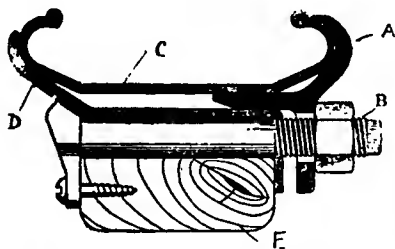
By W. F. BRADLEY.

PARIS, Dec. 20.—The whole interest of the tire section at the Paris Salon centered in dismountable rims. At the beginning of the year three French firms at most were constructing appliances for quick changes of tires; at the Salon there was hardly a stand without some form of quick-change rim, emphasizing a remarkable advance within the year.



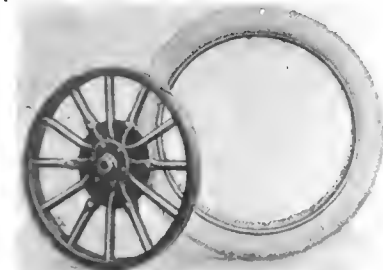
VINET RIM SECURED BY MOVABLE WEDGES.

secured to projecting bolts on the face of the rim, for convenience in changing an outer shoe. Formerly it was necessary to take the rims off and struggle with them on the floor or on a table. By the new method changes of tires on spare rims are easily carried out. Ssizz won the Grand Prix largely owing to his M. L. rims, using an American brace for taking off the nuts. With the new model an improved brace is supplied, known as the "revolver," from the fact that it takes up the nuts as they are unscrewed and holds them one behind the other within itself. The nuts have never to be touched with the fingers, so there is no danger of them falling to the ground. The box



METHOD OF SECURING MICHELIN

key has within it a coil spring pushing a metal disc to within a certain distance of the mouth of the key. Around the tube are three long, flexible, steel blades, each with a projecting head passing through a hole into the interior and close to the mouth of the tube. As each successive nut is engaged on the key it passes behind the spring heads, and is thus prevented from falling out, while the coil spring behind keeps it pressed against the heads in position to be engaged again on the bolt. With this tool the six nuts can be taken off and put on again in less than a minute.



VULCAN DISMOUNTABLE RIM.

M. L., and one which also stood its test in this year's European races, was shown without any changes on the model already described in these columns.

Michelin, who brought out a dismountable rim at the time of the Grand Prix, has now an improved model, which he states will be ready for delivery early in February. Instead of metal wedges forced between the fixed and the movable rim, which had a tendency to stretch the latter and finally cause it to burst, the movable rim is secured by eight hooks clasping round its curved surface and held in position on a

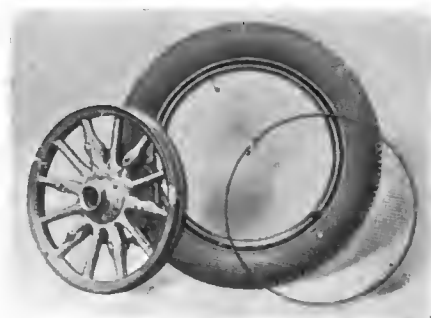
bolt projecting from the face of the wooden rim. The fixed rim has a steel surface with a groove, into which a projection on interior face of movable rim keys to prevent creeping of one rim on the other. In the accompanying sketch *A* is the hook, *B* the bolt passing through it, *C* the movable rim, *D* the fixed metal rim; and *E* the wooden rim.

Jenatzy, the famous Mercedes driver, bases his dismountable apparatus on the principle of fixed steel wedges on the exterior surface of the fixed and the interior surface of the movable rim. There are about a dozen pairs of wedges on the two surfaces, and as each pair is brought together the wedging effort is increased. To secure the two rims, a flat steel wedge with a bolt at each end is inserted laterally and driven home with a hammer.



SAMSON PATENT RIM.

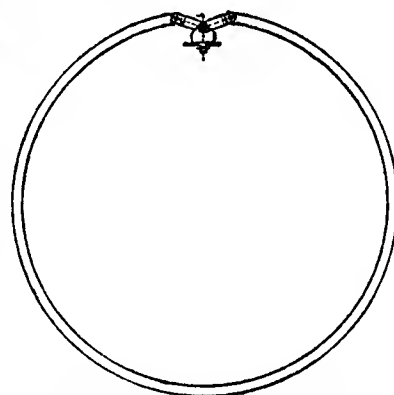
The Vulcan Tire Company presents two types of quick-change tires, the one providing for a change of inflated tire and rim, the other a dismountable flange for easy withdrawal



SADJAL RIM WITH EXPANDING BAND.

of inner tube. For the latter operation the outer metal flange is movable, and has on its inner surface a number of projecting flat-headed studs entering into holes prepared for them on the metal face of the wheel. A slight forward movement of the flange drives the studs home in their grooves and a single screw prevents further movement. The type providing for change of inflated tire and rim has steel-faced fixed rim and ordinary movable rim. On the face of former are a number of diagonal grooves running contrary to forward motion of wheel; and on the movable rim are corresponding flat-headed studs.

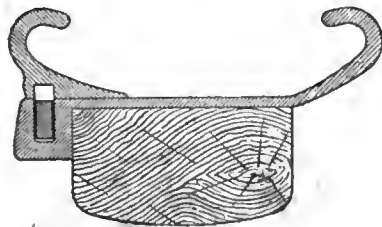
Samson, the leather tire manufacturer, has a rim similar to the Michelin and the M. L., secured by means of six cams on the outer surface of the fixed rim. When turned into closed position a spring prevents further movement of the cam. A box key placed over the nuts to release the cams presses on the head of the embedded spring, allowing free movement. A complete valve



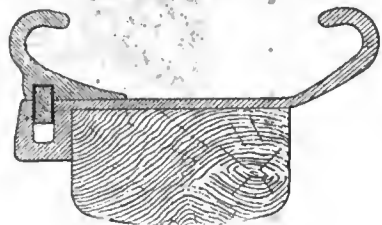
LE REVE CIRCULAR BAND WITH LOCKING APPLIANCE

is left on the Samson, provision being made for it by a hole in the fixed rim.

The Sadjal rim is of the Vinet type, with projections and grooves on movable and fixed surfaces, and final locking by a broken circle with right and left thread screw for closing up.



LE RÊVE RIM UNLOCKED.



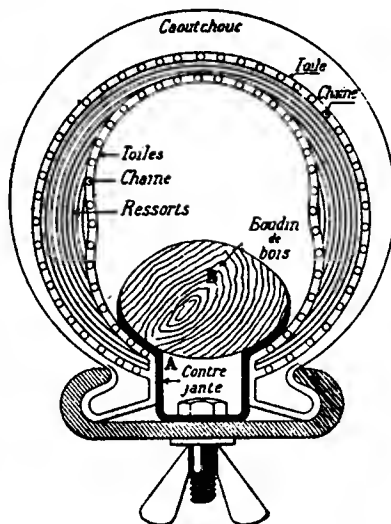
LE RÊVE RIM LOCKED.

Le Rêve is on similar lines with the difference that the broken circle is fixed within grooves and expanded by a strong spring. By pulling down a single lever the expanding band is reduced in circumference, allowing the movable rim to slide off.

The Sider is one of the most original of several attempts made to produce an unpuncturable tire. It has an outer surface of rubber

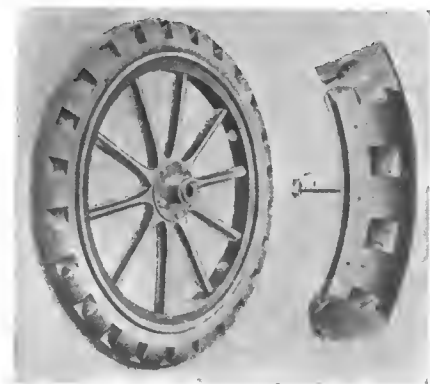
on the usual canvas basis, behind it several layers of semi-circular steel with interpositions of woven cloth. Half the space usually occupied by the air chamber is empty, the other half is fitted with separate blocks of wood held in position by security bolts, wedging the outer shoes exactly as is done by an inflated air chamber.

Elastès is a composition with a rubber basis which is boiled to a liquid point and molded to the shape and size of an air tube. A protecting band is placed round it and the mass put inside an outer shoe. The composition can be made to any consistency to suit different weights. A powerful company has taken up the patent and has secured the adoption of these solid tires on Paris cabs.



SIDER UNPUNCTURABLE TIRE

The Ducasble is a tire seen at the show last year and presented now in an improved form. It is a rubber tire with a number of small independent air chambers, each one about the size of an egg. As each chamber comes in contact with the ground a certain quantity of air is driven out through a small hole on the side of the tire, fresh air being drawn in as soon as pressure is removed.



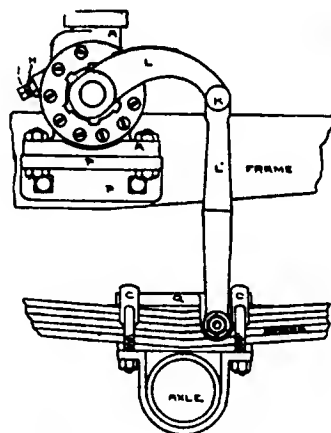
THE DUCASBLE RIM.

J. S. Fougerat has an economical tire protector. An old shoe, or one that is showing

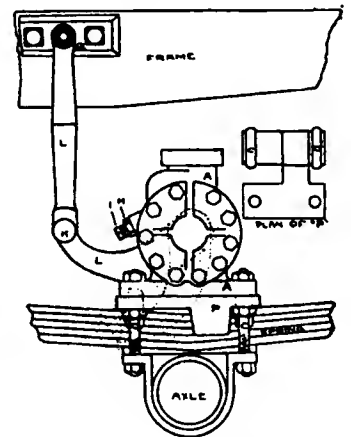
signs of wear, has its heels cut off and a large number of hooks riveted along each edge. To prevent the metal coming in contact with the under tire the canvas is opened along its edge and the hooks inserted between two layers. This protecting band is placed over a good tire, the hooks acting just as the original heels did in holding it on the rim by pressure from the air chamber. Other firms have the same kind of hooks fitted on new bands to place over an ordinary pneumatic automobile tire.

A HYDRAULIC SHOCK ABSORBER.

Shock-absorbing or spring-retarding devices, of which there is at present such an apparently diverse assortment on the market, may be divided in reality into three groups, depending on the basic principle of their operation. These are friction, pneumatic and hydraulic devices, and the majority are of either the first or the third class. Probably the most prominent of the



APPLIED TO CAR FRAME.



APPLIED TO CAR AXLE.

last-named order, and which may be said to occupy a position of its own, is the Hotchkiss Anti-Jolt device. It is unique in that it is not designed to absorb the jar and jolt, but to eliminate them. And the latter occur on the up-thrust, when the springs, which have been forcibly compressed, expand rapidly and literally throw the body of the car and its occupants. The Hotchkiss Anti-Jolt device, which acts on the same principle as that applied to modern high-powered guns to take up the recoil, consists of a piston and cylinder, the latter being divided by a partition in which an adjustable valve is placed. The cylinder is filled with glycerine, excluding the air, and the action of the piston forces it through this valve, the device being so placed as to allow the springs their natural flexibility on the down-thrust, the piston starting to retard the upward movement as soon as they have reached the lowest point of their compression. The device may be readily adjusted to adapt itself perfectly to any car from a light runabout up, merely by altering the opening of the by-pass valve mentioned. This is done from the outside by loosening a lock-nut and setting up or unscrewing the valve adjusting screw. The device is also easily applicable to any type of car and is equally efficient in any position. The methods of applying it to either the axle or the car frame are shown by the accompanying line illustrations.

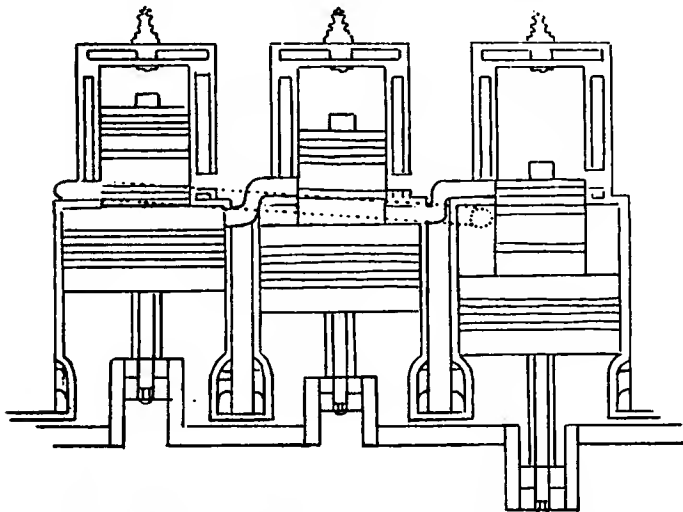
PECULIAR PROPERTIES OF WOOD.

Wood is possessed of several peculiar characteristics where its employment in connection with an electric current is concerned, and a knowledge of them on the part of the autoist will probably serve to make plain some otherwise puzzling conditions. When dry, wood is an excellent insulator, but this quality disappears with its dryness, the current finding a path across the wet surface; when charred or blackened by heat it also becomes a good conductor, but when reduced to ashes it is again a non-conductor.

DEVELOPMENT OF THE TWO-CYCLE ENGINE—PART II*

By C. P. MALCOLM.

THERE is another type of engine that involves much of the same general principles as the independent supply cylinder class that we have just described, and much that we have said of it will apply equally well to this. In this class the lower or pump end of the piston is enlarged. A good proportion is to make its diameter one and one-half times that of the power end; a 4-inch bore cylinder would have a 6-inch bore air pump. As



PROPOSED DOUBLE PISTON TYPE OF TWO-CYCLE.

there is no water jacket or air-cooling fins around the air pump end these cylinders take up no more room than an ordinary gas engine cylinder, but the enlarged end gives it a more symmetrical look, and it does not have a top-heavy appearance. The upper part of the air piston is used as the pump and the air is drawn in and expelled from the space between the cylinder walls of the pump and the trunk of the power piston, and with the sizes we have given it will pump one and one-quarter times the volume that the power piston would. There are three cylinders with their cranks 120 degrees apart, and the up stroke of the cylinder on the end will feed into the inlet port of the cylinder next to it; the latter will in turn feed the cylinder on the farther end and it will feed back into the first cylinder. By this arrangement the inlet port of each cylinder closes a little before the pump feeding it has completed its stroke and the full volume will not be delivered with the dimensions that we have given, but the volume delivered will exceed the piston displacement of the power cylinder.

Independent Supply Cylinder Type Considered.

A better form of construction for this type of engine is made by following the lines pointed out in our study of the independent supply cylinder type, having all of the pumps discharge into one conductor, common to all of the inlet ports. Then each cylinder will take its full charge when its port opens, regardless of which pump is furnishing the supply. In this way there will be no compression above that necessary to make the transfer of the charge from the pump into the cylinders, because some one of the three inlet ports is open more than three-fourths of the time, while in the other way there is considerable more than one-third of the air pump stroke made before the inlet port of the cylinder that it is supplying opens. Considerable of the time two cylinders are pumping at once. By using the single conductor the full one and one-fourth volume of charge will be delivered into the cylinder each time. The engine can be regulated by the throttle and the relief valve method, described in

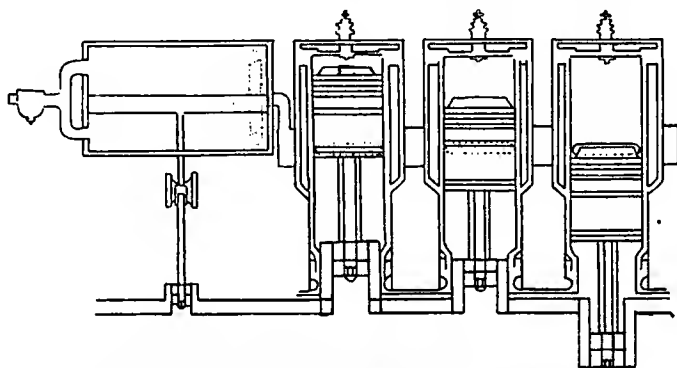
connection with the independent supply pump system, and this is much the better way to regulate. A simple revolving cylinder valve can be made, extending so as to embrace all three of the cylinders and controlling both the intake and the outlet of all of the pump cylinders accurately. This is cheaper, more positive, and more satisfactory in every way than using check valves. This revolving cylinder valve can be run with a silent chain and sprocket or by gearing, making it revolve in unison with the crankshaft.

While the check valve action is almost a necessity in four-cycle practice, the excessive heat making rotary or sliding valves impracticable, and a piston valve, the only alternative, is not only expensive, but cumbersome, there is generally no excuse for using check valves in two-cycle practice. Simple methods of obtaining the required action with rotary and sliding valves are available and are much better and more satisfactory in practical use, being free from jerk and destructive jar. This engine will give better satisfaction when built with a rotating cylinder valve than any other mechanism of its class, making the same number of explosive impulses as six cylinders of the four-cycle type and its action as flexible and as easily controlled in every way.

Some Conclusions Which May Be Arrived At.

Both this type of engine and the independent supply cylinder type, in the perfected form that we have described, are such a long step in advance of the four-cycle that it can only be a question of getting a few of them before the automobile public, so that they will know that there are such engines to be had, before they will take their proper place in the foremost rank of automotors. There is no question but what a three-cylinder engine of either of these types will develop more power than six four-cycle cylinders of the same size, with not to exceed one-third of the mechanism, and that of a simpler and much more durable kind and only one-half the weight. The value of this light-weight feature will appeal with overwhelming force to those who have been connected in any way with building racing machines and have had to keep the weight down to a certain definite limit with the greatest power possible within that weight.

There are, of course, some who will doubt that a two-cycle engine can be made that will develop twice the power that a good four-cycle motor will, although it does get twice the number of explosive impulses. The laws governing the action of an explosive charge in a gas engine are certain and inexorable, and if certain conditions are complied with, certain results are obtained. If the charge in the cylinder is pure, the most powerful explosion possible will be obtained, assuming the same compression in every case, regardless of the "cycle" of the engine. The explosion will be less powerful in rapidly increasing proportion to the quantity of foul gases there are mixed with the charge. Of course, if the cylinder be not charged to its full



INDEPENDENT PUMP WITH RECEIVING CHAMBER.

*Continued from THE AUTOMOBILE, December 27, pages 915-917.

capacity, some burnt gas will be left in it, as it is full of exploded gas at the end of each stroke.

The ordinary two-cycle motor does not develop twice the power of a four-cycle; that is, its explosive impulses are not as powerful as those of a four-cycle engine, because we do not get into its cylinder as full a charge as we do into a four-cycle cylinder. The amount of charge drawn in varies according to the design of the engine. We consider that the design given in part one of these papers marks the closest approach to good practice in this respect, but it will not deliver into the cylinder quite the full quantity; there will be a few ounces of pressure in the crankcase when the piston begins its up stroke, and this pressure represents the amount of charge that should have gone into the cylinder, but did not.

Forcing the Gas Into a Three-port Motor.

When we take the three-port engine, and probably three-fourths of the two-cycle engines, built to-day are three port, we find that not more than two-thirds of the charge that is supposed to go into the cylinder actually does so. We will suppose that the stroke of a three-port engine is four inches, the inlet port of the cylinder is five-eighths of an inch and the inlet port to the crankcase is also five-eighths of an inch. (They are often nearer an inch.) Of course no compression takes place in the crankcase until the piston has descended the width of the port and covered it, after which what charge there is left in the crankcase is compressed and will go into the cylinder as soon as the inlet port is uncovered by the piston. As soon as the piston begins its up stroke it produces a vacuum in the crankcase, and it will suck back from the cylinder into the crankcase again until the cylinder port is covered by the up stroke of the piston. Thus it will be seen that all of the stroke of the piston, measured by the width of the port admitting the charge into the crankcase, plus the width of the inlet port of the power cylinder, is lost, as far as getting charge into the cylinder is concerned. We only have two and three-fourths inches out of the original four-inch stroke that will be actually useful in putting charge into the cylinder. When we remember that even this is not all delivered into the cylinder, there being other losses incidental to all transfers of elastic gases from one space to another within a given time, we see abundant reasons why the explosive impulses of such an engine should not be as powerful as those of a four-cycle, as well as for the general distrust of two-cycle engines, when that type of two-cycle motors is the best that we know of.

A NEW TIRE FILLING COMPOUND.

Numerous efforts have been made to discover a substance that would possess the property of resiliency in a high degree, without at the same time having the disadvantages of melting at a low temperature, that would not decay or disintegrate and that would not injure the rubber of the tire into which it was injected. Attempts to discover such a material date back to early bicycling days, but none of them proved an unqualified success, and few, if any, have survived to this day. Now L. S. Lewis and C. H. Cooley, of Hartford, Conn., think they have hit upon the secret. Their compound is injected in a molten state and is not affected by ordinary changes of temperature as well as being proof against oil and grease; nor does it harden with age. Several Hartford autoists have tried the new substance in the tires of their cars and vote it a success, as the result of which a company, to be known as the Elastro Manufacturing Company, has been organized with \$50,000 capital to market the compound. H. B. Philbrick is its president. Patents have been applied for.

A Tourist Trophy race for motor cycles has been included in the 1907 program of the British Auto Cycle Club, to take place, if possible, the day after the car event on the Manx course. The costly and weary Land's End-John O'Groats trial has been discontinued and a six days' reliability tour, with start and finish in London, will take its place.

ANTI-SKID AND SMOOTH TIRES.

At this season of the year, when anti-skid tires are so generally used, it is well to remember that all shoes with a rough or steel-studded surface have a shorter life than smooth surface tires. M. Michelin, the tire expert, has given the following explanation of this: Every tire is composed of two distinct parts, the carcass which gives the support and the internal air pressure, and the web, frequently vulcanized on the carcass and which may be round, flat, or anti-skidding. The web is the part of the tire which comes in contact with the ground and has to resist road friction. The carcass only receives the reactions of the road through the web, and it is thus easy to see that the nature of this latter has considerable influence on the life of the tire. If two similar carcasses are taken, and one covered with a smooth web and the other with an anti-skid surface, it is the anti-skid tire which would perish first. An anti-skid band is intended to prevent side movement, and to obtain this result metal rivets are interposed on the surface of the tire, this interposition causing a considerable adherence of the tire with the road, and in consequence an integral absorption of all effort or reaction by the anti-skid band.

To be effective every anti-skid must be harsh, and unfortunately it is only harsh to the detriment of the life of the tire. Whatever may be the nature of the band, a steel-studded surface always causes greater strain on the tire.

A smooth tire, on the contrary, has less adherence with the road, slipping over the ground under the influence of harshly applied brakes or a too sudden start. The carcass in consequence is subject to less strain. By careful driving, especially by judicious use of the brakes, the causes of deterioration of anti-skid tires can be diminished. But if the same careful treatment were given to smooth tires their life would be lengthened in increased ratio. As a set-off against the shorter life of anti-skid tires is the fact that they are rarely punctured by stones, glass or nails.

Drivers in long-distance European touring competitions are unanimous in declaring that good anti-skid tires never puncture. When they are worn thin they burst, but give no previous trouble.

A PUNCTURE-PROOF TIRE FROM AKRON.

AKRON, O., Dec. 31.—L. Greenwald, superintendent of the tire repair department of B. F. Goodrich & Co., has invented a puncture-proof tire which at present is passing out of the experimental stage, as it has proven under exhaustive tests to be more than was anticipated. It is likely that steps will be taken before long to introduce and manufacture the tire. It is claimed for this tire that it answers all of the purposes of a tire that is not puncture-proof, which most so-called puncture-proof tires do not do, and at the same time it is fully punctureless.

The invention involves three constructions of puncture-proof tires, molded in the outer cover, on the inner tube and separately. Owing to the materials employed and the nature of its construction, the resiliency or present features of the tire is not affected in the least. The old cases in which the protector is used in this tire are kept whole on account of the reinforcement and the elimination of blowouts resulting from rupture in the outer case or from an imperfection in the material or construction.

In connection with the protector there is a special construction of tube, and this combination practically eliminates all injury except natural wear.

The nature of the test to which the tire has been subjected successfully indicates its worth. The tire was placed on an auto owned by a physician and a pound of nails and spikes were driven into a plank and the plank fastened to the floor. Then the car was driven over the sharp points, first slowly and then fast, and the tire came out of the test uninjured, it is claimed.

Bosnia is the first country in Europe to issue a postage stamp with the picture of an automobile, the new 50 hellers bearing such an impression.

STEAM FOR PUBLIC SERVICE VEHICLES

STEAM as a motive power for public service vehicles was the subject discussed at the monthly meeting of the British Institute of Mechanical Engineers in a paper read by Thomas Clarkson, member, of Chelmsford, England. He said in part:

"The selection of the motive power for public service vehicles must be considered in its relationship to the public safety and the convenience, as well as with respect to the state of the art. It has been commonly supposed that steam was unsuitable, and assuming the ordinary methods of application, this conclusion is probably correct. The question arises: Is one justified in assuming that ordinary methods represent its highest possibilities? One object of this paper is to show that this is by no means the case, and that recent developments in the methods of harnessing steam for public service have entirely altered the situation.

Some Advantages That Are Claimed for Steam.

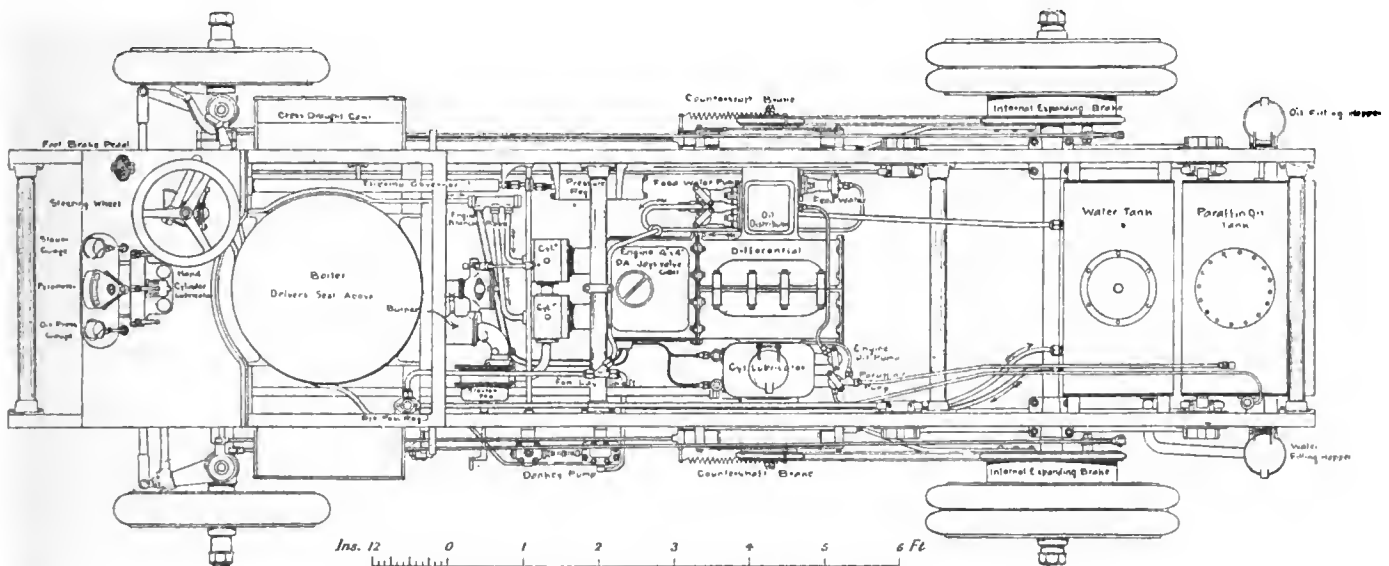
"In 1905 the first double-deck steam omnibus of the author's construction commenced regular service, and at present there are

transformed to a gaseous state. The vapor is mixed with air—on the Bunsen principle—before ignition takes place, and the heat maintains the temperature of the vaporizer.

Concerning the Burner and Oil-supply.

"The main fuel-supply is carried in a tank not subjected to pressure and therefore can be replenished quickly without extinguishing the burner. The kerosene is pumped from the main tank into a pressure tank of solid-drawn steel, which is about half full of air. This forms a cushion which keeps the burner fed when the car is standing and the pump not delivering oil. The surplus oil delivered by the pump escapes through a spring-loaded relief-valve set to about 40 pounds' pressure and returns to the main tank.

"Simple and expeditious starting of the burner has received much attention. Preliminary heating with alcohol is slow, uncertain and expensive. The employment of the two fuels (one for starting and another for running) is also objectionable. The



PLAN VIEW OF CHASSIS CLARKSON STEAM OMNIBUS

about forty licensed in London. The advantages of steam for public service may be generally summarized as follows:

- The employment of a safe and cheap fuel.
- Freedom from noise, vibration and smell.
- Smooth and silent action of the machinery.
- Quick acceleration, flexibility, and ease of control.
- Large reserve power for hills and for starting.
- Entire absence of change-speed gears and friction clutch.

"To realize these important advantages a perfect steam-generator is necessary. Here the principal engineering difficulty has been encountered. The usual methods are characterized by smoke, dirt, constant attention to water-feed and stoking, trouble from priming, incrustation, and leakage. Therefore it is safe to conclude that the usual methods are unsuited for the purpose. To produce a generator free from the above vices has proved a serious problem. It is surprising to many engineers to find that steam can be generated automatically as required, and that the generator has been made, for all practical purposes, foolproof.

"For the purpose of description, the generator may be conveniently divided into three parts, namely, the burner, the boiler, and the governing gear.

"The burner is constructed upon the principle of supplying kerosene under constant pressure to a vaporizer, in which it is

preliminary heating is now done in one minute with kerosene, and the heat obtained as follows: A cast-iron box contains several asbestos wicks saturated with kerosene which readily ignite from a match. A current of air is blown from a fan into one side and through the other side of the box a strong flame is driven. The flame is directed against the body of the burner so as to ignite the mixture as soon as it appears. This arrangement will start the main burner in fifty seconds, and the omnibus can move by its own steam in ten minutes from 'all cold.'

Only Water Tube Boilers Are Used.

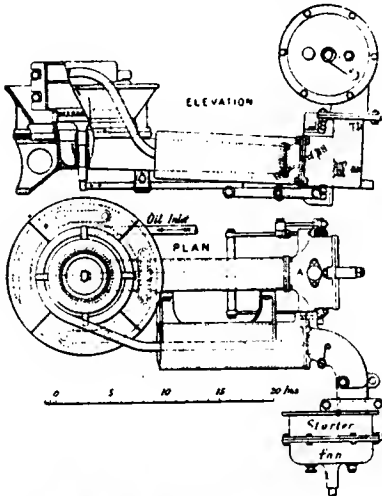
"The boiler is constructed wholly of water-tubes. These are disposed so as to absorb the maximum heat from the products of combustion before the latter are allowed to escape, by employing the regenerative principle. The tubes nearest the fire are maintained at a fairly constant temperature by a thermostat and the water-feed is governed directly by the steam pressure.

"The governing gear is a most vital part of the generator combination, since upon it depends the very existence of the boiler itself. It may be divided into fire-control and water-control. It must be understood that the full power of the burner is in excess of the maximum demands for heat, and the flame is continually checked by the governor, regulating the supply of steam in accordance with the variations of the load. The main principle is

the maintenance of an equable temperature in the steam; in other words, the supply of heat to the generator is governed by the temperature of the steam generated. The employment of highly superheated steam is essential for economical working and 700 to 800 F. is found to be a convenient temperature. The automatic water-control of the generator is in the form of a by-pass regulated by the steam pressure. The pumps are always taking the full charge of water, which is either delivered into the generator, or allowed to return to the tank, should the by-pass be open. There is no intermediate condition.

The Engine.

"The engine has two horizontal double-acting cylinders, 4-inch bore by 4-inch stroke, in two separate castings. They are attached to distance-pieces bolted to the outside of the aluminum gearbox, which contains the crankshaft, crossheads, connecting rod, and all the valve motion. It is found convenient to place the valves for the distribution of the steam beneath the cylinders, as this dispenses with the necessity for the employment of



BURNER AND STARTER DETAILS.

draincocks for removing the water of condensation at starting. The valves are of the piston type fitted with rings, and are actuated by Joy gear. This enables a very simple form of crankshaft to be employed, built up of two parts, each forged out of the solid and bolted together with a steel spur-wheel in the center. The cranks are at right angles. No adjustment is provided, but large and well-fitted surfaces of the hardest bronze working against a hardened and ground steel face are provided and with a constant flow of oil over them. Such an engine will run 30,000 miles without developing any appreciable knock.

Some Features of General Arrangement.

"An air-condenser is placed in the front of the chassis, forming the front of the bonnet, and in this is housed the generator. The engine is between the generator and the rear driving-axle. The cylinders lie horizontally and forward of the engine. The engine-gear is completely inclosed and the motion is transmitted from the crankshaft to the differential by the spur-gear in the reduced ratio of 3 to 1.

"The differential is of the spur type, which is preferred to the bevel type on the score of simplicity. The differential shaft carries the eccentrics for actuating the pumps, and to its outer ends are fitted brake-drums and also the chain sprockets. No change-gears or disengaging clutches are employed.

The Brakes and Their Application.

"Three independent brakes are provided. The first brake is operated by a foot lever and causes blocks to be applied to both sides of 18-inch drums fixed to each of the ends of the differential shaft. The second brake is actuated by a side lever which causes two segmental blocks to expand within a drum, bolted to each of the driving wheels; the brake load is balanced in a similar manner to the foot brake. The third brake is available in the engine, since by merely reversing the valve-gear a considerable resistance is offered to the movement of the car, even if steam is shut off.

Concerning the System of Lubrication.

"General lubrication of the engine and differential gear is by a system of pump circulation combined with an automatic dis-

tributing valve, supplying oil to each of the bearings successively. The engine and differential cases are combined, and a well fitted at the lowest point. Into this all the surplus oil drains from every bearing, and from it the oil is delivered by a force-pump into a circular valve-box connected with every bearing of the mechanism. To provide against the possibility of any of these distributing pipes becoming fouled or obstructed, a circular valve is provided which covers up all the outlets except one. This one therefore takes all the oil delivered by the pump. The distributing valve is slowly rotated by a worm gear on the differential shaft, the oil is automatically transferred from one bearing to another, and the possibility of stoppage is avoided. The system has the important advantage of taking out of the hands of the driver the responsibility for attention to lubrication, particularly for the high-speed mechanism.

"Owing to the temperature of the steam a high grade of hydrocarbon oil must be used for the lubrication of cylinders and valves. The result of the author's experience has led him to adopt a system of force-pump feed. An aluminum box, forming the reservoir for cylinder oil, also contains two pumps, the plungers of which are forced down sharply at regular intervals by a cam-operated spring. There is no packing of any kind in the pumps, but the plungers are made a good fit. After the cylinder lubricator has been charged, no further attention to cylinder lubrication is necessary for 1,000 miles. It merely requires periodical inspection and replenishment from the engineer in charge of the garage.

Conclusions Deducted from the Test.

"The mileage done by the car in question is as near as possible 27,000 miles (7th October). The only replacements to the engine are: piston-rod bushed, crosshead guide bushes, piston-rod sleeves and piston rings. The total cost of materials comes to about \$8. The valves in pumps have never been ground or their seats touched. The lubrication of engine and cylinders has been most satisfactory and the automatic lubricators have given practically no trouble. The fuel consumption averages one gallon to 4 1-3 miles."

ROBERT L. DUNN'S WAR LECTURE.

WASHINGTON, D. C., Dec. 29.—A lecture complimentary to the Automobile Club of Washington through the courtesy of the Pope Automobile Company, of Washington, was given at the New Willard by Robert L. Dunn, the well-known war correspondent. The lecture consisted of notes on the Russian-Japanese war and was a connected pictorial narrative of the greatest conflict of modern times. In a very modest way Mr. Dunn told how he landed in the Orient two weeks before hostilities commenced and without waiting for credentials started for the prospective scene of operations, Korea. He landed at Chemulpo early in February, and by some strange freak of newspaper luck the war began under his very eyes with the landing of the first Japanese army and the destruction of two Russian war ships. Mr. Dunn was introduced by President Duvall. The programs were unique, being printed on Chinese paper, bound with a piece of straw rope to which was knotted a piece of Chinese money.

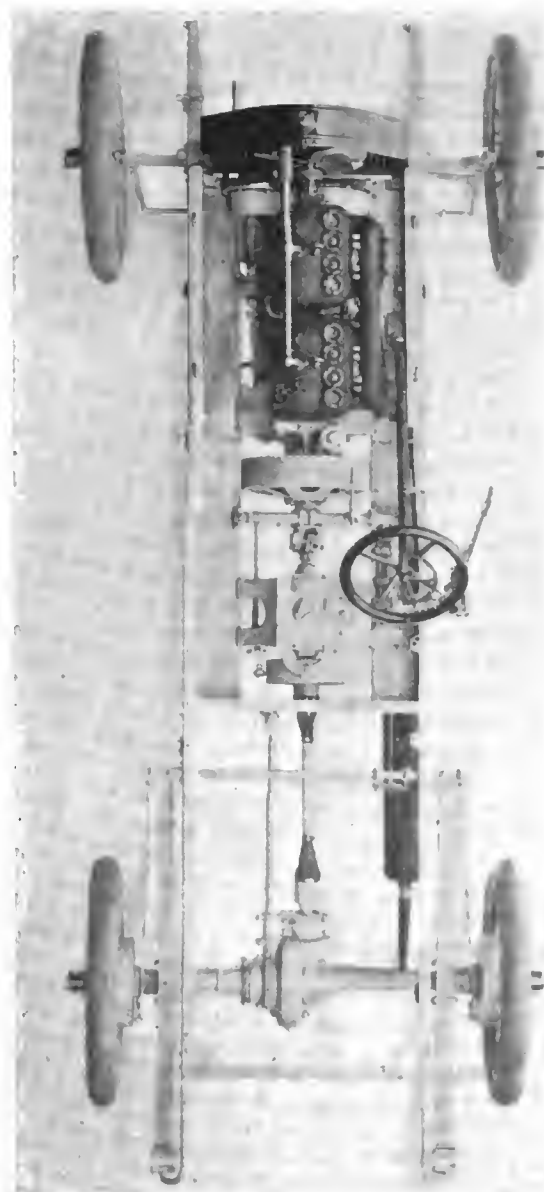
For the better protection of its extensive warehouses and docks at Huelva, in Spain, the Rio Tinto Copper Company has recently acquired a powerful and interesting gasoline motor fire-float, in which the vessel itself and the pumps for throwing the water jets are driven by this type of motor. The gasoline motor is of the vertical type with six cylinders, developing 60 horsepower, and drives a single screw propeller through a clutch and shaft. The pumps for discharging the jets are driven by the gasoline engine through clutches, and their combined capacity is 1,200 gallons per minute. Each pump supplies three hose connections on deck, capable of throwing 1 1-2-inch, 1 3-4-inch and 2-inch jets respectively, or the entire delivery can be directed into one swiveling monitor throwing one large stream.



JUST what standard of design would be followed in the evolution of the Thomas "Forty," or whether conventionality in this respect would be entirely departed from and something entirely original be produced, has been a matter for speculation ever since the announcement of the linking of the Thomas name with the new Detroit plant. Conjectures on the subject have suddenly been set at rest by the appearance of the new car—not merely as an advance model, but in numbers in the shape of cars already in the possession of their owners. When the plant was first put in operation last summer, a schedule of deliveries was outlined and this has been adhered to, resulting in the appearance of the new Thomas "Forty" in different parts of the country at the same time.

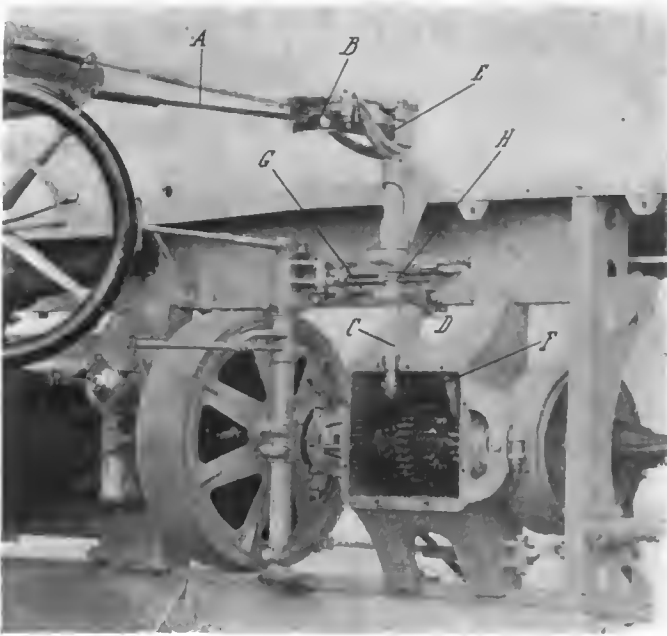
A glance at the car as well as its specifications shows that it is intended as a candidate for the ranks of that class that contains only too few representatives—the medium-priced touring car of high capacity, speed and power in comparison with its weight and cost of maintenance. This is evident from the fact that in complete running order, with a generous lamp equipment, the car lists at \$2,750. It is made both as a touring car and high-powered runabout, the chassis being substantially the same in both cases with the exception of those detailed changes necessary to fit it for the latter rôle, such as raising the gear ratio.

Motor Design.—It is at once evident that it has been the aim of the designer throughout, not alone



TOP VIEW OF THOMAS "FORTY" CHASSIS.

where the power plant is concerned, but the entire car, to along lines of extreme simplicity, a fact that is apparent at the first glance at the motor. It is plain that the combined experience of other makers has been drawn upon and their mistakes avoided, and this, together with the knowledge of what is most needed in such a motor, has combined to produce a power plant that has been reduced to its lowest terms and which possesses the advantages of extreme simplicity and ease of adjustment in a superlative degree. Thus the valves, valve mechanism, spark plugs with their connections and the carburetor are all centered on the right-hand side of the motor, making every part of the latter accessible by lifting one side of the bonnet. An interchangeable system of making the parts has been adhered to throughout, so that not alone the valves but pistons, connecting rods and all other parts are likewise interchangeable, a limit of variation of one-half-thousandth of an inch being maintained. Drop forgings of special steels are employed for the crankshaft and connecting rods and the best grade of iron obtainable for the purpose is used in the making of the pistons and rings. The piston pins are hollow and of large diameter, being clamped in the connecting rod end. All bearing surfaces have been designed of generous length and all the main bearings are interchangeable. They are of special anti-friction metal shaped under heavy hydraulic pressure, and while liners are furnished it has been found that the bearing



TRANSMISSION AND CONTROL LEVERS.

surface provided is so ample that adjustments are not required until after a lengthy period of use. All bearing caps are heavily ribbed to prevent distortion and four bolts are provided at the big end of the connecting rods instead of two as is usually the case, in order to permit of a more even adjustment of these bearings than is ordinarily possible.

An original and interesting departure from standard practice is embodied in the valve-operating mechanism, rendering the setting of the valves readily adjustable. Side thrust is eliminated by interposing a roller between the cam and the valve lift. This roller is carried by a light steel arm pivoted on the opposite side of the crankcase across which it extends. It is encased on top and upon this case the valve lifter rests. The cam strikes the roller directly, imparting a vertical motion to the valve lifter, thus avoiding side thrust and its wear. The opening and closing points of the valves may be readily verified by means of a pointer fixed to the crankcase in connection with the usual marks stamped upon the periphery of the flywheel. The aluminum crankcase is bolted to the frame horizontally instead of vertically, and the cylinders are given a one-inch offset on it in order to minimize the side thrust on the power stroke. The compression is 75 to 80 pounds and the motor delivers its rated output of 40 horsepower at a moderate speed.

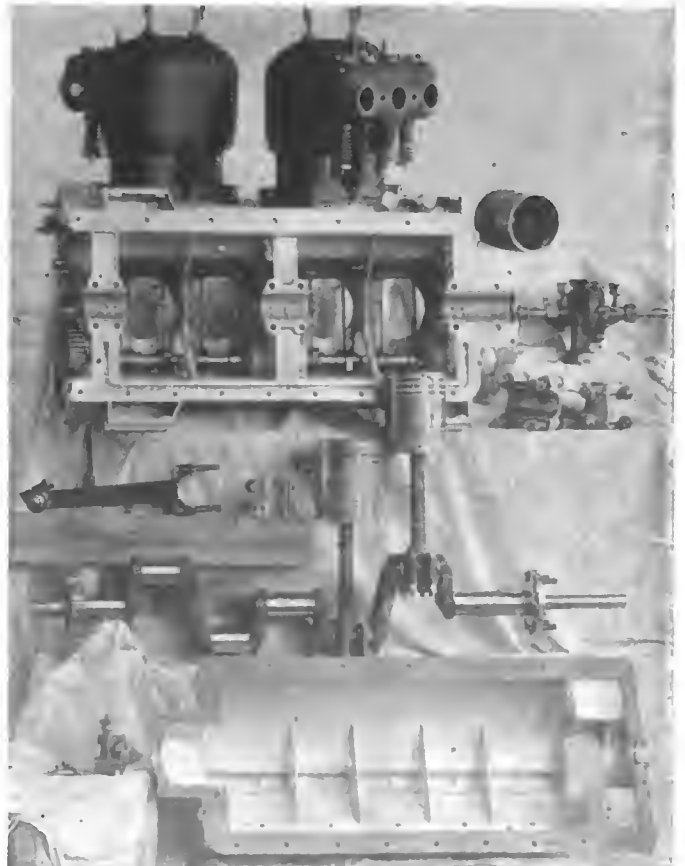
Motor Accessories.—The carburetor is of the automatic compensating type with the usual float feed and has been designed to effect fuel economy as well as a minimum of necessity for adjustment. Following a tendency that has developed of late, the timer, which runs on ball bearings, is placed directly beneath the footboard, so that the raising of the latter makes it particularly accessible. The remainder of the ignition system consists of a four-unit coil on the dash with a set of accumulators as current supply and dry cells as a reserve. A bracket designed to accommodate any standard magneto is provided on the crankcase, directly in line with the pump shaft, so that fitting this form of current supply presents no difficulty whatever. Any magneto desired will be installed on the car as an extra.

For cooling, a radiator of the vertical flat tube type, which has been found to give such a high degree of efficiency, has been adopted. In the course of tests, the tubes of a radiator of this type have been expanded to several times their normal size, showing that it would not be damaged by freezing. The water is circulated by means of a centrifugal pump, gear-driven from the camshaft. The suspension of the radiator is unique in that no side supports are employed; it is merely bolted to a bracket beneath, which carries its weight, and is supported at the top by

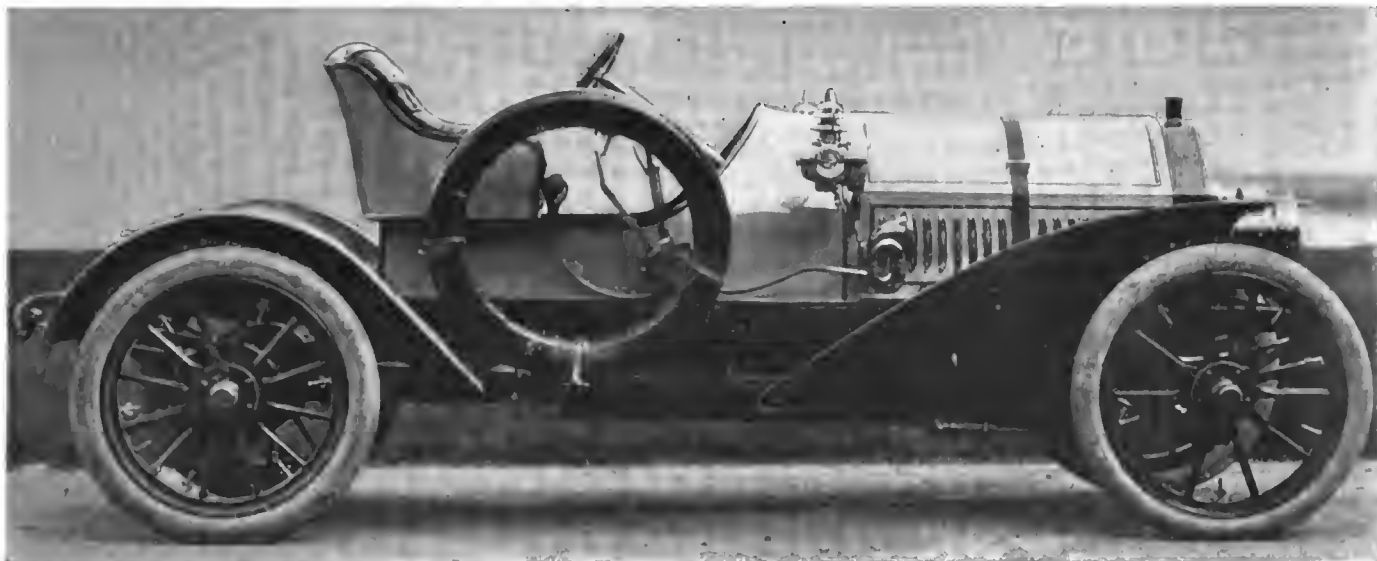
a brace rod extending to the dash. In this way the twists and strains of the frame in traveling over bad roads are not communicated to it and one source of annoyance—that of a leaky radiator—is well avoided. A belt-driven fan running on ball bearings placed directly behind the radiator completes the cooling system. The fan belt is made adjustable by means of a single nut. Drain plugs are placed in the lowest part of the jackets so that the latter may be completely drained whenever this becomes necessary.

Particular attention has been paid to the matter of lubrication, with the result that a system that is at once highly efficient and extremely simple and certain in operation has been devised, even the casual observer noting the total absence of oil pipes on the exterior of the motor. The system consists of an oil well or reservoir in the shape of an auxiliary tank cast on the lower side of the crankcase, and an oil pump communicating with the main bearings of the motor, the whole being self-contained within the engine itself. As long as the motor is running, oil is being pumped from this supply well onto the main bearings, from which it overflows into the crankcase. Holes communicating with the reservoir or well are drilled in the crankcase at a certain height, thus insuring a constant level at all times, the oiling of the big ends and pistons being taken care of by the splash. A glass bull's eye is provided in the front end of the reservoir so that the amount of oil contained in the latter is evident at a glance. To further insure against any failure in the oiling system, the oil pump and the ignition timer are placed on the same shaft, any derangement of the latter that would cause the oil pump to cease operation also bringing the motor to a stop by putting the commutator out of commission. The timing and pump gears are all well inclosed and packed with non-fluid oil.

Transmission.—As the first step in the transmission of the power to the road wheels, an aluminum cone supported on a steel hub and with a leather facing backed by helical springs, engages the inner side of the flywheel. This conical clutch measures 16 inches in diameter and has been tested to hold more than the maximum output of the motor. The cone is ribbed



MOTOR OF THE THOMAS "FORTY" DISMEMBERED.



THOMAS "FORTY" SPEED CAR, WHICH DEVELOPS A GAIT OF 60 TO 65 MILES AN HOUR.

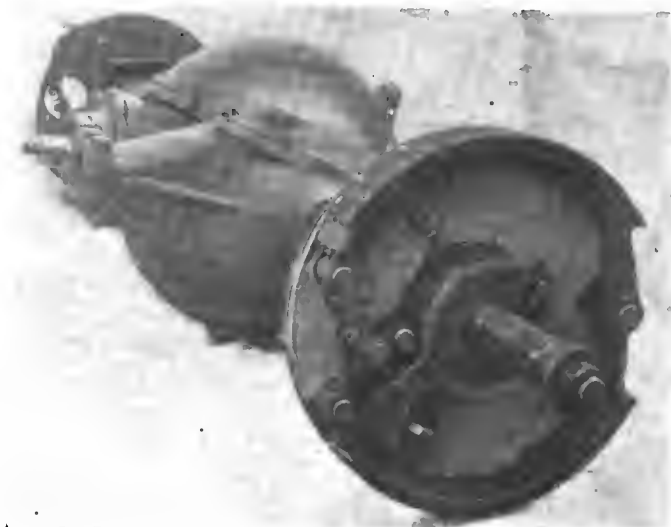
instead of being solid, in order to make it as light as possible, which, in connection with its small diameter, tends to overcome the faults of excessive inertia and momentum usually inherent in clutches of this type where insufficient attention has been paid to the matter of size and weight in their design. From the clutch the power is carried to the gearbox by means of a universal yoke or cross to allow for any relative movement between these two links in the transmission. In order to avoid the friction generated by the usual form of disengaging collar, this duty is performed by two steel rollers.

The gearbox provides three speeds forward and reverse and is operated on the selective system of gear changing, in connection with a novel system of control. This is made plain by the illustration, in which A is a hand lever rocking about B as a fulcrum, C being thus movable endwise by means of a flexible connection E between this shaft and the lever A. The finger F in the gearbox engages either of the sliding gear members at the option of the driver; a second D, also keyed to C, engages at all times the interlocking slide G, permitting gears to be shifted only when the clutch is disengaged. The spring H holds the lever A when in neutral in such a position that the movement forward gives the intermediate or usual starting speed, while a backward movement throws in the direct drive or usual running speed. It is thus only necessary to move the lever H sideways from neutral against the tension of the spring to obtain either the reverse or low speed. The gears and shafts are of nickel steel, running on American roller bearings; stuffing boxes are employed to make the case oil-tight. A standard type of propeller shaft with universal joints at each end constitutes the connecting link between the gearbox and the rear axle. The universal joints are inclosed in leather casings and run in heavy grease, while the propeller shaft is made of a high-carbon steel.

Running Gear.—The rear axle is of the Timken semi-floating type and Timken roller bearings are used throughout the running gear. The front axle is a single piece I-beam drop forging of steel with the cross bar connection of the steering gear, which is of the screw and nut type, placed back of it. This provides protection for the latter when meeting light obstructions and is a safeguard against accident due to a deranged steering gear arising from such a cause. The suspension is of the semi-elliptic type both front and rear, the latter measuring 52 by 21-4 inches and the former 36 by 2 inches. A pressed steel frame of the usual channel section is employed, with a subframe dropped 4 inches for the support of the motor and transmission. A steel plate is riveted between the main and subframes, forming a portion of the scheme of dustproofing the entire mechanism and adding a continuous stiffening effect throughout the entire length of the subframe, which extends for almost two-thirds of the length of the car. The wheels are 34 by 4 front and rear for

touring service and 34 by 3 1-2 front on the runabout, this being the only difference between the two other than the change in the gear ratio already mentioned. Extending beneath the entire mechanism a sheet steel dust pan the width of the subframe is placed. An ingenious clip permits its instant removal. The wheelbase is 112 inches and the tread standard, the touring body having a seating capacity of five. The weight is 2,550 pounds.

Brakes.—Realizing the great importance of this part of the car, its designer has gone to unusual pains to provide a braking equipment of more than sufficient capacity to take care of every emergency. Two sets of brakes are employed, the first or transmission brake, used for ordinary running and operated by a pedal, and the emergency brake, which is of the internal expanding type, is located in drums on the rear wheels. They are effectively encased in a steel housing to protect them from dirt, adjustments readily being made through the hand hole provided for that purpose. The transmission or foot brake consists of a 10-inch sheet steel band, with a 3-inch face, acting upon a steel drum bolted to the propeller shaft universal yoke. This band is lined with camel's hair felt, making it particularly effective. The suspension of this brake is worthy of mention in that a very simple and effective method of accomplishing this has been employed, which at the same time provides against the possibility of the band dragging when not in use. The spring shown in the illustration of the brake serves to hold it out of action when running.



HOW THE REAR AXLE LOOKS WHEN DISMOUNTED.

CARE OF THE IGNITION STORAGE BATTERY

By H. GERNSBACK.

IT is probably not realized by many autoists that over 80 per cent. of American gasoline automobiles are equipped with storage batteries for ignition, and a few hints on how to handle and care for such a battery will, no doubt, be welcome to the user. It is not the object to go into mere technicalities nor to explain the theory of the accumulator, but rather to state how to avoid a great many mistakes which have come under the observation of the writer. A storage battery of any make is a very complicated piece of electrical apparatus and has to be treated accordingly in order to obtain satisfactory results from it. The automobile manufacturer, who usually buys the battery with which he equips his cars, does not always find the time to go into details concerning batteries, and the owner of a new automobile should convince himself that the battery is up to its standard, fully charged and free of corrosion, before he puts out for a long trip. He should always bear in mind that there is no storage battery made which will hold its charge for over two months, and a new car that has been standing in a salesroom for a long period will be found not to work satisfactorily, or frequently not at all, if the battery was not kept charged properly. The general tendency is then to condemn the battery, which might be the best in the world, but if it is not kept in a state of usefulness by proper charging and care, its efficiency is totally destroyed.

Inspecting a New Battery.

A new battery should be first inspected to see if it has enough acid (electrolyte). To do this, unscrew the vents, or plugs, which are usually located in the center of each cell. The liquid must, under all circumstances, cover the plates, which can be seen by looking through the opening of vent tube. Should this not be the case, *distilled* water should be poured in each cell until the liquid stands at least one-fourth inch over the top of plates. It is not necessary to add acid, as only the water evaporates. The remaining solution, therefore, becomes denser and denser, and when distilled water is added the electrolyte will be brought up again to its proper specific gravity. Ordinary water should never be used in a battery, as even small quantities will invariably prove disastrous. If distilled water cannot be obtained, clean, filtered rainwater may be used to good advantage. The user should never attempt to take a long trip without previously testing his battery and a double test, which the writer never has known to fail, and which is described below in its essential details, ought to be made.

This comprises a voltage reading and a "sparking" test. Every cell should be tested individually by means of a low-reading voltmeter (0-3 volt) and as long as a battery shows 1.9 volts it will be found good for a 50-mile run. This voltage reading must be made while the engine is *running*, as a battery at rest will not give a correct reading, due to the recuperation. It is a well-known fact that an accumulator will show 1.9-2 volts per cell on open circuit, even if it was totally run down previously. As soon as the circuit is closed, however, the voltage will fall to 1.5-1.0 inside of half a minute. This property tends to mystify the layman a good deal. The "sparking" test must be done carefully and not oftener than absolutely necessary. As it is nothing but a dead short-circuit, which of course does not tend to improve the battery, the writer would not recommend the method if a better one were known; if, however, one is a little careful no damage will ever arise.

How to Test the Cells.

Procure a piece of insulated wire of 12-gauge about 8 inches long and scrape off the insulation at both ends for about one-fourth inch. Place one end of the wire firmly on one of the end binding posts of the battery; with the free end of wire touch the other end binding post rapidly in such a manner that the contact will

not last longer than a fraction of a second. A loud, snappy, blue spark will be the consequence if the battery is well charged. If not, the spark will not be loud nor bright.

The writer does not recommend the use of an ammeter, for the purpose of investigating the total amperage of battery; ammeters are usually wound with such a low resistance that when a test is made, which in order to be fairly accurate has to last for about five seconds, directly short-circuits the battery. If this is done often it will ultimately ruin the battery, due to scaling and bending of plates. The "sparking" test also helps to find troubles which could not have been found with the volt meter alone. For instance, the writer often saw batteries which tested up properly in voltage but which could not be made to run the coil nor incandescent lights. The "sparking" test was applied, but without result. It was found that either corrosion had taken place, the connection bolts were loose, or oxidized, or else a lug which connects the plates was broken. After these troubles had been remedied the battery worked again as well as before.

When a Cell Is Fully Charged.

A freshly-charged cell should register 2.20-2.25 volts on open circuit and from 2.10-2.15 when the engine is running at high speed. From this point the voltage soon drops to 2.00, and from there very slowly to 1.90. In fact, three-quarters of the discharge lies between these two points. When the voltmeter once registers 1.80 volts the discharge should be discontinued, as at this point the coil will stop working abruptly, which is a hint to have the battery recharged at once. To get the maximum mileage from a battery the coils must be so adjusted that they take a minimum of current. No benefit is ever realized by forcing 4-5 amperes through a coil; in fact, it is detrimental to the platinum points, to the coil itself, to the timer, and to the spark plug. A four-cylinder coil should never take more than 0.75 ampere, when the engine runs at full speed. In order to achieve this, turn back all the vibrator thumb-screws in such a way that the tremblers just work without the engine missing fire. If once adjusted the coils should not be touched for the season, and one will get a good idea of the efficiency of the battery.

The average sparking battery, if well constructed, should last from three to four years, if it is treated properly, which means recharging it every three weeks, no matter if run down or not; even if it stands idle a charge should be given to it every four weeks, otherwise the plates will become sulphated (coated) very soon, greatly reducing the efficiency of the cells. To keep metal parts from corroding they should be coated with vaseline once a month. In order to prevent the battery from being thrown around in battery box, put some shock-absorbing material, such as machine waste, excelsior, or the like, under, and around the sides of the igniter. This will prevent it from breaking and from being damaged internally.

PASSING OF THE NAME "CHAUFFEUR."

It would appear that that ill-chosen Gallicism "chauffeur" has been doomed to be consigned to oblivion. England and America are agreed for once on the use of the same word to designate the same thing and that word is driver. By an imperial edict Germany has let it be known that she will have none of it; her chauffeurs will henceforth be "wagenfuehrers," and where there are two one will be the "hauptwagenfuehrer" and the other the "unterwagenfuehrer"—a generous mouthful in either case, but not disturbing to a Teuton. Even France has gone back on her own choice, for the average Parisian now prefers "mecanicien" to designate either the driver or his assistant, from which it is apparent that chauffeur will sooner or later be relegated to the limbo of forgotten terms.

LETTERS INTERESTING AND INSTRUCTIVE

The Necessity for Intelligent Valve Grinding.

Editor THE AUTOMOBILE:

[520.]—Will you please tell me through "Letters Interesting and Instructive" how to grind the valves of an automobile engine and how to know when such grinding is necessary? Is it not possible to make an engine with valves of a type that would not require grinding? I cannot understand why, if valves are properly fitted and the engine is kept working under proper conditions, it will be necessary at such frequent intervals to regrind the valves. Any light you can throw on this subject will be greatly appreciated.

City Island, N. Y.

JOHN WILKINS.

Valves need grinding, because it is impossible to protect them from the wear that necessarily occurs on certain portions with all moving mechanisms. Even by the use of the best steels, it is impossible to provide a quality of material that will indefinitely resist the scoring action of the rapid flow of gases, together with the corrosive action due chiefly to their high temperature. Added to these is the chemical action of water or other minor components of the mixture, and the continuous hammering when the valves are in action. When the full force of these various destructive effects is realized it becomes a wonder not that valves wear out but that they last as long as they do. By careful designing most of the injury is made to occur at points capable of being readily resurfaced by the process of grinding. To grind a valve it is necessary to apply a small quantity of fine abrasive material between the valve and its seat, following this by rotating it with a screw-driver, brace, or any convenient means, until the faces in contact are bright and smooth. Almost any abrasive may be used, even sand from the roadside having been utilized in an emergency, but with the harder abrasive such as emery and carborundum it is very essential that all traces of the grinding material be removed after the work is completed, since otherwise they will cause wear in the cylinders. Some experts prefer to use ground glass, grindstone dust, and the like, because of this point. The need of grinding is indicated by lessened power, due to leakage of the gases through the valves; by unusual ease of cranking; by backfiring into the carbureter, and by the condition of the valves themselves, in respect to pitting, corrosion, and incrustation.

Carbonized Cylinders and Air Cooling.

Editor THE AUTOMOBILE:

[521.]—Is it a fact that the cylinders of an air-cooled engine carbonize inside at frequent intervals, so that they have to be removed and the pistons taken out to scrape away the carbon? Is this the real and serious objection to this type of motor? I am told that this is the case and would greatly value your opinion.

Barberton, Ohio.

WILLIAM WALTERS.

With some types of air-cooled motors, not as well designed as they might be, there undoubtedly exists the tendency to which you refer. In such cases carbonizing occurs in a combination of the high temperature and the undue quantity of oil used, the surplus oil being burned imperfectly because of the lack of sufficient cooling means, with the result that it is deposited in the manner you mention. When such deposits reach a certain amount there is, of course, nothing for it but to take the engine down and give it a thorough cleaning. The necessity for this is generally indicated by the frequent occurrence of preignition, due to projecting points of red-hot carbon within the cylinder. With the best and most successful air-cooled motors of to-day no more oil is required than with a water-cooled car, and overheating is little, if any more, likely to occur, especially in the hands of a competent operator. It must be remembered that even with the best systems of water cooling it is possible, through careless operation or defects in design, to have carbonizing occur to a very serious extent. Carbonization of oil in cylinders, therefore, is something liable to occur in both water-cooled and air-cooled cars.

Anti-Freezing Solutions for Water-Cooled Cars.

Editor THE AUTOMOBILE:

[522.]—In the issue of "The Automobile" of December 6, I note a short article on non-freezing solutions for automobiles, in which the experience of readers was invited. I have made some experiments along this line, and gave the results to the local paper for the benefit of fellow automobilists in the town. As the results in the form of data will, in all probability, be of value to owners of cars in other parts of the country, you may reprint them if you wish to do so.

C. F. NIXON, Ph.G.

Leominster, Mass.

The fluids recommended are solutions of calcium chloride, glycerine and wood alcohol. I made a 10, 15, 20 and 25 per cent. solution of each of these and determined the freezing point of each, with the following result:

Calcium chloride—Ten per cent. solution freezes at 15 above zero F.

Calcium chloride—Fifteen per cent. solution freezes at 5 above zero F.

Calcium chloride—Twenty per cent. solution freezes at zero F.

Calcium chloride—Twenty-five per cent. solution did not freeze at zero.

Wood alcohol—Ten per cent. solution freezes at 15 above zero F.

Wood alcohol—Fifteen per cent. solution freezes at 5 above zero F.

Wood alcohol—Twenty per cent. solution freezes at 2 above zero F.

Wood alcohol—Twenty-five per cent. solution freezes at zero.

Glycerine—Ten per cent. solution freezes at 20 above zero F.

Glycerine—Fifteen per cent. solution freezes at 15 above zero F.

Glycerine—Twenty per cent. solution freezes at 8 above zero F.

Glycerine—Twenty-five per cent. solution freezes at 5 above zero F.

Zero Fahrenheit was the lowest point I could reach with my freezing mixture. This is, I believe, low enough for practical purposes, as these higher percentage solutions freeze mushy, and not solid. They would not, therefore, in my judgment, expand enough to burst the parts if they did freeze in the machine.

I have in my machine a mixture of one part each of wood alcohol and glycerine and two parts water. I do not believe that this will freeze above 10 below zero. As shown above, a 25 per cent. solution of calcium chloride stands the lowest temperature, but is objectionable, as it is likely to corrode the parts with which it comes in contact. Wood alcohol will evaporate by the heat of the engine and more must be added at intervals. Both glycerine and wood alcohol are likely to soften rubber connections after a time, but this would be a small matter.

Some Questions Concerning Fuel and Ignition.

Editor THE AUTOMOBILE:

[523.]—Is there any advantage in the distance from the carbureter to engine? Will a carbureter give the same service with a long pipe to engine or bolted direct to cylinder? Which of the two patterns of installations would make the engine start easier? Should the float in a float-feed carbureter be set so the gasoline will stand up as high as possible without running over at the spraying nozzle, or slightly below the top of nozzle? Why is it that the air-valve springs in carbureters for single-cylinder engines are made large in diameter with but few coils, while for multiple-cylinder engines the air-valve springs are small with several coils? Will a carbureter made for a four-cylinder engine give satisfaction on a single-cylinder, both engines having the same size inlet pipe? How is the proper way to adjust a vibrator, and how do you tell when it is adjusted properly?

Flemingsburg, Ky.

A SUBSCRIBER.

While there is some difference of opinion as to which of the two methods you describe really constitutes the better practice, a majority of designers seem to be in favor of getting the car-

bureter as close to the inlet valves as possible. With a long pipe, it is obvious that there must be a certain amount of attenuation of the air upon suction, with the result that the carbureter is not brought as instantaneously into operation as might be desirable. On this account the Renault people have even patented a system of feeding fuel by means of four carbureters—one for each cylinder. On the other hand, there is one school of engineers that insists upon a certain advantage supposed to be inherent in the long piping, it being claimed to act as a sort of reservoir for mixture, so that it is not necessary that the carbureter be brought instantly into action, there being enough fuel in the intake piping to provide several charges. On the 1907 six-cylinder Panhard cars a scheme of this sort is applied, it is said, with good results. There are so many factors concerned in the starting of an engine that it is difficult to give a conclusive answer to your third question. If the engine had not been stopped long the mixture contained in the long intake piping might cause it to start very easily; while if the motor had stood for some time it would seem that the carbureter close up would be the idea. A float-feed carbureter should be so set that the gasoline will stand about a sixteenth of an inch below the top of the atomizing nozzle. This will require that the level maintained in the float chamber be fully a quarter of an inch lower still, because of the capillary attraction in the small bore of the nozzle. Even with the fuel very low, however, it is surprising how the suction of the engine will draw it out. We do not think that it is a fact that air-valve springs vary in the way you state, except in isolated instances. A small diameter-spring, with several coils, however, is likely to act more quickly than the other kind, which might be of advantage with the more steady work entailed in feeding four cylinders. A carbureter suitable for a single cylinder of given size should feed four cylinders of the same size equally well. The reason of this is that four cylinders do not overlap in their demand on the carbureter, but require fuel one after another. They thus keep the carbureter working more constantly, but do not make any greater demand upon it than a single cylinder. The adjustment of vibrators is difficult to explain without taking up considerable space, and can be learned most effectively by experimenting until a good, hot spark is obtained between the plug terminals under normal working conditions. The sound is less of a guide than is commonly supposed. A good deal of information on this subject was given in THE AUTOMOBILE, issue of November 15, 1906, in answer to question No. 467.

Another "Hardy Annual" Crops Up Again.

Editor THE AUTOMOBILE:

[524.]—I have an argument on hand at present, and it is one that you have probably had before you more than once in the past. A claim that an automobile going round a curve at a very high rate of speed, such as on a track, for instance, will upset toward the inside of the track. I hold, that if it turns over, it will go in the opposite direction, and base my claim not alone on theory, but on experience. Any moving object which, when going in a certain direction represented by a straight line, is suddenly turned from its course, tends to continue in the original direction, and centrifugal force, in the case of a car, will cause it to turn over outwardly or away from the track fence. I am certain that your explanation will not only settle the argument in my favor, but will also make the matter clear to many another.

Bronx, N. Y. City.

JAMES REUTERSHAN, JR.

This is, indeed, one of the hardy annuals in the way of questions on an elementary principle of mechanics; no matter how often it is answered it continues to crop up again and again, and usually in about the same form. Automobile racing in particular has served to give it a new lease of life. Of course you are right. It would be about as erroneous to state that a blazing pinwheel throws its fire toward its center or hub, when revolving at a high speed, as to say that an automobile tends to overturn inward when rounding a turn at sixty or seventy miles an hour. From one cause or another, automobiles have upset toward the infield of the track during the course of a race, due to colliding with an obstruction, defective steering gear, or something of the kind, and

probably this has given rise to the general assumption in question. When a body traveling in a straight line at high speed changes its course two forces come into conflict—gravity and centrifugal force. If the speed of the object be so great, and the radius of the curve so short that centrifugal force overcomes the attraction of gravity, the object will leave the ground and tend to fly in the direction it was originally traveling. In the case of a car the inside wheels would leave the ground and the car somersault sideways toward the outside of the track. This has been illustrated in automobile accidents time and again, such as that on the Florida beach two years ago. It is in order that the attraction of gravity may always be superior to centrifugal force that railroad curves and race tracks are banked. This shifts the center of gravity to the inside wheels of the car and prevents it from overturning outwardly, as would be the case were a curve taken at high speed on the flat.

Peculiar and Unusual Fan Trouble.

Editor THE AUTOMOBILE:

[525.]—I have a small four-cylinder water-cooled car, the cylinders of which are commencing to show a great tendency to become overheated. The radiator is the usual honeycomb pattern, with fan behind it, and the cooling system holds five gallons of water. Whenever the car is run hard for a short time, the water boils and overflows, while the cylinders get so hot that I am afraid of the pistons scoring them, through injury to the lubricant. I can find no obstruction in the cooling system, and the water seems to circulate freely, the pump being apparently in good order.

Altoona, Pa.

ALFRED JADWIN.

Unless there is some obstruction or deposit in the waterjackets, so located as to prevent the free circulation of the water to other portions of the cooling system, it would seem probable that there is something wrong with the air blast through the radiator. Of course, heating may occur with a great many cars if the engine is run hard for long periods, with the car standing still but if this is not your trouble, and the trouble has come on simply in the course of ordinary use, it cannot be thus easily explained. We have known of cases in which the fan blades became bent, and by running too nearly flat failed to set up the blast required, despite their rapid rotation and the fact that everything else appeared to be in perfect order. A thorough investigation along some or all of the lines suggested should disclose the difficulty. Pay particular attention to the condition of the fan, as suggested, especially if it be of the type in which the blades are not shrouded together by some sort of peripheral member.

WHY MR. HOTCHKIN COULDN'T DEMONSTRATE.

Editor THE AUTOMOBILE:

[526.]—It is with pleasure that I inform you of the conviction of Willie Parker and Harry Stein, who stole my 1906 Packard demonstrating car from in front of the First Regiment Armory, on the opening night of the Auto Parts Show, September 22, 1906. They were sentenced December 19 to one year's term in the county jail, each. They have already been in jail about three months, awaiting trial. This makes the jail term about fifteen months for them. Parker comes of a good family, his father being an ex-vice president of the Chicago Board of Trade. He has been in several scrapes before. Harry Stein is now wanted by the New York City police for theft of automobile parts. It is more than likely that these boys would have been released with a reprimand had I not instructed my attorney to proceed against them. They are members of a gang of automobile thieves and are both implicated in the theft of Messrs. Gardner, Fairbanks, and Corder's machines, from this city. They also have confessed to the theft of several other machines, and it was high time that a check was put on this kind of business.

With my own machine, they ran, as near as I can find out, in three days, about 700 miles, and succeeded in wrecking it to such an extent that it cost me in the neighborhood of \$300 to have it repaired. Visitors at the Parts Show thought it was a bluff on my part, when I announced that I could not make demonstrations on account of the theft of my demonstrating car.

Trusting that this may be of some service to you as a news item, and that you will be kind enough to straighten up the matter set forth in the last paragraph, I am,

P. M. HOTCHKIN.

Chicago, Ill.



(Continued from pages 911-914, THE AUTOMOBILE, December 27.)

THE milestones bordering the French roads, or rather the *bornes kilométriques*, are exceedingly well placed, legible, and accurate. They mark the distance, on the great trunk roads leading out from Paris, from the capital to the other termini, "Routes Nationales" Nos. 10 and 12 Paris—Brest, via Versailles, Alençon, and Rennes; "Routes Nationales" Nos. 13 and 172, Paris—Coutances, and the Route de Nantes, via Versailles, Chartres and Le Mans.

Besides showing the kilometerage, they note also the class of route, its official number and, when a stone is on a boundary between one département and another, their respective names. On the minor roads this information is no less clear and explicit, but the distances are usually reckoned as from one *chef-lieu* (county town) to another.

One Can't Go Astray in France.

if he knows the plan and procedure on which these kilometer stones have been laid down; and if he travels along a navigable river, in the now facile and popular canot-automobile, he will find the river bank marked off in the same way, except there is a little white stone each hundred meters (ten to a kilometer). This is that you may not be over charged if you have recourse to a towboat. You pay for *remorquage* (towing) by the kilometer, hence some sort of official reckoning was made necessary. France is paternal all the way through, and she does not neglect the roads and their users, or *les chemins qui marchent*, as Pascal called the great rivers.

The other road markings in France are even more thorough and detailed than the kilometer stones, though the distances as given by the two classes of markings do not always correspond. It depends upon whether the distance is reckoned from the center of the *ville* or the edge or boundary of the *commune*, and again as to whether a road has recently been straightened or not. This accounts for the occasional discrepancies between the little blue painted, cast iron signs which are at every cross roads and the figures given by the kilometer stones themselves—this, and the fact that often, since the kilometer stones were first planted, a road has been straightened here and there and a kilometer has been saved in the distance.

All these are governmental affairs. Then come the most excellent road markings of three private organizations: the Automobile Club de France, the Association Générale Automobile, and

The Omnific Touring Club de France.

which, with more than a hundred thousand members and the President of the Republic as its patron, is doing a wonderful work in all things appertaining to "le tourisme" in France, whether one travels by road or rail, by an automobile boat on the water, or a land automobile, or for that matter, by balloon or aeroplane.

The Touring Club de France is plentifully besprinkling all the main roads with great painted signs giving the terminus of the route, the town through which one is passing momentarily (Good idea, this!), and the next town or city in either direction, with their proper distances, all marked in great staring letters at least four inches high, so that one may read literally as he runs—and this, be it remembered, is what the automobilist likes. As the new locomotion makes headway in France all things apparently strive to keep pace with it. This, more than all else, accounts for the supremacy of France in automobilism to date.

Coupled with the above mentioned excellently planned and placed signs, are still others denoting that an important town lies a certain distance just off the main road, or that a natural curiosity, a fine viewpoint, a cascade, a chateau, or a Roman ruin are but a half a kilometer away.

All this makes for enjoyable travel by road, and gives the stranger the benefit of an intimate acquaintance with the land so far as his finding his way about goes. One must know how to read all these signs, and where to look for them, and be possessed of a nose for topography, as the French have it, nevertheless.

The Association Générale Automobile.

goes farther and marks danger spots in a striking and efficacious manner by a series of staring black and white painted iron plaques, with no wording thereon, but with a series of cabalistic signs which even a Digger Indian or a Sioux could understand without being told. I understand the Vanderbilt cup commission used these signs on the Long Island cup course and that they proved highly satisfactory.

A simply drawn or silhouetted gateway means that a level railway crossing will be met with soon; an archway with a passage beneath, that the road passes beneath a railway; and a sort of great inverted U indicates a culvert or *caniveau* across the road (most welcome, this!). Finally there is a little nondescript thing, like the hump on a Bactrian dromedary, which indicates the nearby presence of a *thank you, ma'am*, known in France as a *dos d'âne*, or donkey's back.

There Are Other Signs.

and signals that the traveler on the roads in France meets with once and again, and is glad he does. One is a white lettered sign on a blue ground stating that a half a kilometer farther on



CHEMIN DE GRAND COMMUNICATION.



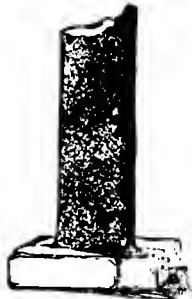
ROUTE NATIONALE AT THE COTE DE GAILLON.



ROUTE DEPARTEMENTAL IN NORMAND

the route is in *en course de réchargement*, meaning that there is road repairing going on; this is well to know before you come suddenly upon it. A similar sign announces that a steam roller is at work; this, presumably, is for the benefit of horse-drawn traffic.

There is another class of signs—and this is all—those put at either end of a straggling village or town restricting the speed of automobilists to twelve, ten, eight, or even six kilometers an hour while passing through—the speed that the local *maire*, who most likely is a *bon bourgeois*, or even a peasant farmer, who never rode in an automobile in his life, thinks is proper. Sometimes one is held down to *au pas* (a walking pace), and whenever one meets with one of these warnings he had best take it to heart, for the local authorities can be very severe when they like, even in France. It is all well meaning and well done in many cases, for a narrow, twisting cobblestoned main street in an unknown French town has untold horrors for a stranger automobilist, even if he is adept.



ROMAN MILESTONE IN PROVENCE.

Road obstructions are not unknown in France, but the law is very strict against one's taking up more than his proper share of the road. If you overtake a slow-going vehicle it must make way for you and let you pass. Even with the peasant road user this is not mere idle theory or an unused law, as it frequently is in England, where a motorphobe will often not get out of your way, even if you threaten to have the law on him.

The law is summary in France, with contravention against the rule of the road, as with other minor offenses, though it is true that bureaucracy oftentimes clogs the wheels. Once when

We Had Been Struck by a Market Wagon,

which tore our front mud guard off its supports, we were interrogated by a couple of anxious-to-please gendarmes, who were equally anxious to make a *procès verbale* against a poor, well-meaning Norman *paysanne* who was driving her cart to market loaded with butter, eggs, and fowls, to say nothing of a bleating calf. She meant no harm, and the damage was really slight, and we were not in the least vindictive. In spite of this, the action of the gendarmes showed at any rate they bore known no illwill against *les étrangers* and didn't suggest for a moment that the case might be turned against us. How different! Oh how different, might have been the case in England!

The two gendarmes simply sprang up from nowhere—they were not in sight previous to the *tamponnement*—and they simply filled their notebooks with pros and cons that they might have something to show their brigadier as a result of their morning's work. The old lady was, as natural, scared half out of her wits and we ourselves—this being the first experience of the kind in some years of automobile travel—were something more than curious, perhaps even excited. The only cool persons, in fact, were the two gendarmes of the nationality which is usually accounted the most excitable of all races, unless it be the evil-eyed Sicilian.

The interrogatory of the old lady being finished, the gendarmes turned to us—we were four, the author, the artist, and two in the tonneau.

Our *papiers* were demanded, produced, and found in order. (The first thing an

automobilist is asked for by an "agent" or a "gendarme" in France is his *papiers*. Verb sap: Have them always handy.) Our addresses were then noted, and then the driver was asked his age, birthplace, and—of all things—"Quel est le nom de votre merc?" Why this, we expostulated? "It is for your good," said the brace of courteous gendarmes in chorus.

Was there ever a law so completely polite in its procedure! All was given that was asked for, and all of us went on our ways rejoicing; the old woman thankful that she had not been called upon to pay up; the gendarmes grateful for something to break into their monotonous existence; and ourselves that we might take to the road again and make up for lost time.

The French Peasant Knows the Law

very well, and observes it, though he may have a natural resentment for the dust you throw up in passing. This is human nature. Everyone keeps to their right as a matter of course, and everybody in France is exceedingly careful in taking corners—all but the drivers of butchers' and bakers' carts in suburban Paris, who are the same as their reckless brethren everywhere else.

Stray cattle, and even dogs, have no rights on the roads, and if you bowl one over there's no damage to be paid for by you if you were not otherwise reckless, and you even have a redress against the proprietors of the beasts if they have caused you damage. In some parts grazing cows by the roadside are invariably held by a cord. This is the case in Normandy, but in Brittany they always have a guardian with them, an incompetent little Breton peasant maid in *sabots* and *coiffe*, who loses her head immediately you heave in sight, and deserts her charges, leaving them to your tender mercies, which are, of course, gracious and gallant. One could not take advantage of one of these winsome and theatrical looking little samples of Breton femininity.

Speaking of Brittany Suggests

that it is there that one meets a most unusual puncture fiend in the shape of *sabot* nails. They have a way of dropping out of the wooden shoes affected by all classes in the Breton countryside, and resting point uppermost all over the ground. So numerous are they that one has only to scratch the earth, anywhere between Nantes and Quimper and Mayenne and Brest, to gather a handful of these exceedingly vicious hobnails. There's only one remedy, and that is good heavy tires that they won't puncture; then every night you simply run your hand over their peripheries and pull out a half dozen, a dozen, or twenty of these sharp pointed, big headed nails—that's all.

Just for the Sake of Comparison

it is interesting to stop and consider what travel in France was a hundred years ago, particularly for the foreigner, usually the Englishman, who came over the same road that De Warde and Buckingham took in the time of Louis XVI. A hundred years ago it cost nearly five pounds sterling, which is not greatly more than it does today, and the journey was first made by coach from London to Dover, and then by a cranky little shallop across the Channel to Calais.

Next morning the Paris coach left en route for its final stopping place in the French capital. The average speed was four miles per hour and 54 hours were consumed in this part of the journey.



SOME OF THE ROAD SIGNS OF THE TOURING CLUB OF FRANCE.

CLUBS START NEW YEAR WITH SOMETHING DOING

Massachusetts Automobile Association Transacts Business.

BOSTON, Dec. 31.—The board of directors of the Massachusetts Automobile Association held a meeting recently at which plans were discussed for the management of the association under the new rules of the American Automobile Association. According to the new rules Massachusetts will be entitled to four representatives on the board of directors of the A. A. A., and it is expected that the State association will become of much more consequence than has been the case heretofore. The directors decided, in view of the increased work that will fall to the officers of the association, to divide the office of secretary-treasurer, and James Fortescue, secretary of the Bay State Automobile Association, was elected secretary, and J. C. Kerrison treasurer. The directors have nominated as representatives of the Massachusetts Association on the board of officers of the A. A. A. President Elliot C. Lee, of the Massachusetts Automobile Club; President Lewis R. Speare, of the Bay State Automobile Association; President John P. Coughlin, of the Worcester Automobile Club, and President J. L. Haynes, of the Springfield Automobile Club. The Massachusetts association has over 1,600 members, and now has six representatives on the A. A. A. board. A campaign will be made in this State to secure individual memberships in the A. A. A. as well as the customary club memberships.

Quaker City Motor Club Adopts Constitution.

PHILADELPHIA, Dec. 31.—Over 150 of the 235 members of the Quaker City Motor Club attended last Thursday night's meeting at the club's new quarters in the Hotel Majestic, when the constitution and by-laws, after a three-hours' revamping, were finally adopted. The nominating committee submitted a long list of candidates for permanent officers, the names of some of the best-known men in local, professional, and business circles being included. The election is scheduled to take place at the next monthly meeting. Formal application was made to-day under the laws of Pennsylvania for the incorporation of the club. The club is making active preparations for a big campaign of endurance runs, race meets, hill climbs and parades during the incoming year of 1907. The endurance run to Harrisburg on New Year's Day is the initial one on the schedule.

Inter-City Bowling by Massachusetts Automobilists.

WORCESTER, MASS., Dec. 31.—Representatives of the Worcester Automobile Club and of the Bay State Automobile Association of Boston met to-day and arranged for a series of bowling matches to be held this winter between representative teams of each organization. The first match will be in Boston January 24 and the next in this city on January 31. The matches will be held every week, alternating between the Hub and the Heart of the Commonwealth. Both clubs will contribute a silver trophy, to be chosen later, which will be awarded to the winning team. Mr. Weltman will captain the Worcester team. He says some of the members need exercise and will get it before the advent of the spring season.

Automobile Club of Buffalo Elects New Officers.

BUFFALO, N. Y., Dec. 31.—At the annual election of the Automobile Club of Buffalo the following board of officers was elected for the current year: President, Seymour P. White; vice-president, Frank B. Homer; secretary, D. H. Lewis; treasurer, D. M. Satterfield; board of directors, the above-mentioned officers and E. R. Thomas and Charles Clifton. The retiring president, H. A. Meldrum, was presented with a beautifully-designed loving cup, and W. H. Hotchkiss made an address on new legislation pertaining to the use of automobiles.

Automobile Club of America Moves Its Executive Offices.

NEW YORK, Jan. 1.—The executive offices of the Automobile Club of America were removed on Monday, December 31, to the new clubhouse on Fifty-fourth street, west of Broadway, where in the future all of the business pertaining to the club will be transacted. The new building will not be open for the use of members until its final completion, of which due notice will be given. Jefferson M. Seligman has been appointed chairman of the club's sign-post committee, and touring members who may note the desirability or necessity of placing directing signs on the road in various localities are requested to communicate with Chairman Seligman.

A committee on public safety, consisting of the four ex-presidents of the club—Winthrop E. Scarritt, chairman; George F. Chamberlin, Albert R. Shattuck, and Dave H. Morris—was appointed by the board of governors at its meeting December 28. The committee will consider ways and means whereby the club may better use its power and influence toward correcting certain evils which have grown apace in connection with the evolution of the sport and industry, and will act with the law committee in recommending to the legislature such changes and amendments as may seem necessary for the better protection of all users of the highways, and take a determined stand against speed madness by the reckless owner or the inconsiderate dare-devil chauffeur. An address on the purposes and aims of the committee will soon be issued.

Bay State Automobile Association Has a Christmas Tree.

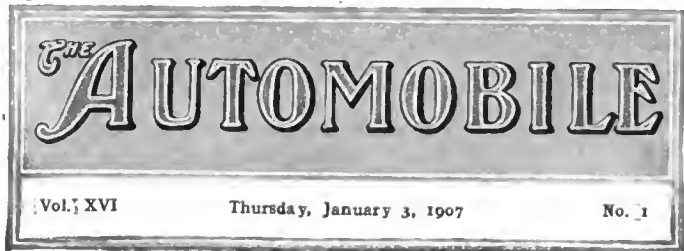
BOSTON, Dec. 31.—The annual meeting for the election of officers of the Bay State Automobile Association and for such other business as may come before the meeting, will be held on Monday, January 7, at the clubhouse, 282 Dartmouth street. During the year the club has occupied its new clubhouse and has gained materially in membership. It has been very active in all lines, among its events being the spring race meeting at Readville track, the tour to the White Mountains in the summer, and the gymkhana games this fall, besides several short tours to Rye Beach and other places. A new feature of the association's activity established during the year has been the dining service at the clubhouse. This has been well patronized by the members and is a pleasant part of the club's life. The club is to celebrate New Year's as usual, but instead of a run to some place at a distance, as has been the custom, the celebration will take place at the clubhouse and will include a dinner and entertainment. Saturday evening there was a Christmas tree with appropriate gifts to all who were present. Secretary James Fortescue was remembered by Santa Claus in a substantial manner.

Long Island Automobile Club Selects Committees.

BROOKLYN, N. Y., Dec. 31.—The regular monthly meeting of the Long Island Automobile Club was held last Wednesday evening at the Cumberland street clubhouse. Some slight amendments to the by-laws were adopted and standing committees for the coming year were selected. Dr. A. C. Howe heads the garage committee as chairman. The house and entertainment committees have been combined under one head, and the chairman is Frank G. Webb. L. T. Wise again heads the technical committee. The membership of the club numbers 400.

Rhode Island A. C. Elects Officers on January 9.

PROVIDENCE, R. I., Dec. 31.—The annual meeting and banquet of the Rhode Island Automobile Club will be held at the Garnet street clubhouse on the evening of January 9. E. A. Rusden, a well-known member of the club, sails on January 8 for a trip around the world, part of which will be by automobile.



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Progress of the Self-Starting Device.

One of the first drawbacks encountered when the internal combustion engine had passed the limit of small units readily started by hand, was the problem of getting it under way. The means employed during the fifteen or twenty years that engines sufficiently large to require it have been built, have been numerous and diverse, though long before the end of that period they had reached a common basis in the majority of instances. Some of the earliest took the form of ordinary black powder cartridges, fired by pulling a lanyard as was done on old-time guns, while others were merely small motors of the same type, which were started by hand and their power utilized to turn over the larger engine until it took up its own cycle of operation. Still another that is in use to-day on comparatively small motors consists of a hand-pump by means of which an explosive mixture may be forced into the cylinder under compression.

The latter also dates back a number of years, and it has come to be the commonly accepted type, except that the engine itself is depended upon to generate the compression and air alone under pressure is stored in a tank. This is utilized either by direct admission, operating the motor as a single-acting air-engine until it takes up its cycle, or through the medium of a small compressed-air motor. In view of the general acceptance that this manner of starting large power-units has met, it seems more than strange that there should have been any hesitation in its adoption on the automobile. That the ability to start the motor from the seat has long constituted something greatly to be desired goes without saying, but that there has been, during the past few years, a somewhat inexplicable groping further afield, resulting in more or less abortive complication, is likewise true. It has been responsible for the numerous devices that have come and gone

without the car being any the better as the result of their invention. A self-starting device to be successful must, above all, be simple and easily controlled, and, barring the use of a lever at the seat, which is merely the handcrank in another place, compressed air seems to fulfill these requirements better than anything that has been tried thus far.



Influence of the Automobile on Motor Design. It has been well said that the changed requirements of automobile service have brought about the evolution of a motor that differs almost as much from its predecessor, the internal combustion motor of the stationary type, as the latter does from the steam engine. But a comparatively few years ago the prediction that such a motor, as is now in common use on the automobile, could be produced, would have been ridiculed. Including its bedplate, a modern gasoline engine of the stationary type rated at but 6 horsepower, weighs from 1,100 to 1,500 pounds. Assuming that the bedplate accounts for at least 50 per cent. of this, it may still be said that engines of this type will average close to 100 pounds per horsepower. It is evident that not alone this, but half of it, would be an excessive unit of weight per horsepower for the automobile, and though, ten years ago, the stationary engine designer would have ridiculed a motor that weighed not more than 10 to 12 pounds per horsepower, as nothing more substantial than an inventor's dream, this has come to pass and a still greater reduction is being sought for.

A new influence is at work to make a motor in which the weight bears an even more remarkable ratio to the power output, not only a possibility but a practical reality. This is the demand for a motor suited to the requirements of aerial navigation. In brief, these are merely that the motor shall produce the greatest power with the least weight, and though in passing through the throes of invention such as assailed the automobile builder several years ago, designers of aerial motors have brought forth some truly wondrous creations, they have also achieved some very remarkable results. Every expedient known to the designer has been resorted to in order to increase the power and reduce the weight, and such figures as three or four pounds to the horsepower have been attained. This naturally represents a standard considerably below the safe practical limits—in fact, it has not been found practical to design a motor having less than six pounds per horsepower. But whether above or below this limit, the chief stumbling block that the designer of motors for aerial purposes has had to contend with is the factor of reliability. It has been found possible to build motors of these seemingly impossible weights and motors that would run—but their operation has been fitful and uncertain. Still there appears to be no reason to doubt that eventually success will reward efforts in this direction as it has in the case of the automobile.



Is Revenue the Sole Object of Auto Laws?

Legislation that will bring about perfect regulation of any activity, that will be just and, above all, that will equitably affect the interests of all concerned, can never be enacted at the behest of any one branch of the community. The radical would banish the automobile from the highway totally; his less prejudiced co-worker would permit its continued existence under practically prohibitive restrictions and so down through varying degrees of severity. The New Jersey statute, which is being hailed as a success by its advocates after six months' trial, is a typical instance of the result of legislation enacted to benefit one section of the community at the expense of another. In its formulation, both equity and comity were equally ignored and its alleged success consists largely, if not entirely, in its efficacy as a revenue producer. Of the fact that its instigators have succeeded in mulcting the same number of autoists of a larger sum than ever before, there can be no doubt, but a long step backward was taken where equitable legislation on the subject is concerned.

WYCKOFF, CHURCH & PARTRIDGE DINNER.

A notable galaxy of automobile stars sat at the speaker's table at the annual dinner of Wyckoff, Church & Partridge, held on the evening of December 27, at Reisenweber's, New York City. It has been the yearly custom of this up-to-date concern to have a dinner, and this time the intent was to make it of a character representative of the entire industry, and the effort was unquestionably successful. Job E. Hedges, the legal luminary of the American Motor Car Manufacturers' Association; Charles T. Terry, counsel for the National Association of Automobile Manufacturers; M. I. Brock, associate manager of the Association of Licensed Automobile Manufacturers; Senator Martin Saxe, well known in automobile legislation; Senator Slater; A. R. Pardington, manager of the Long Island Motor Parkway; S. M. Butler, secretary of the Automobile Club of America; Dr. F. A. Cook, a noted Arctic explorer, whose next effort will be to the South Pole, and the Rev. Arthur Whittenham, of Oxford, were those who supplied speeches, humorous, interesting and instructive. After C. F. Wyckoff had made a well-worded address of welcome, he turned the oratorical feature over to Toastmaster Thomas F. Moore.

Mr. Hedges, among other things, stated that the sentiment against automobiles as such is dying out. Senator Saxe commented that judges were needed rather than additional legislation for the enforcement of the present laws. Mr. Terry predicted that some day the only legislation necessary will be such as to provide for complete identity of machines and the exercise of due caution in the use of the highways. Over a hundred were present at the function.

AUTOMOBILE MAIL SERVICE FOR MILWAUKEE.

Postmaster Owen, of Milwaukee, has let it be known that on and after February 1, 1907, the "beer city's" mail is to be collected with the aid of automobiles. Three machines have been ordered for the service and it is confidently expected that they will be ready to go into commission on that date. The city has been divided into districts so that both the business and the outlying districts will be better served than by the old methods.

FOUR MILES MORE FOR THE PARKWAY,

Though it is reported that some of the landowners along the route of the proposed Long Island Motor Parkway are holding out for big prices, this is not the case generally by any means. A. R. Pardington, the manager of the Parkway, is just in receipt of the following letter from W. H. Jones, chairman of the board of supervisors of Nassau county, which speaks for itself:

"I have authority to offer you about four miles of right of way east of Hicksville, through lands which I own and two of my neighbors. One of my neighbors is, at the present time, in Paris. I wrote to her some time ago and she has authorized me to offer this to the Parkway company. I have taken up the matter with some of our people who own property nearby, and all of them will, I think, donate the necessary right of way. I have other parties who are interesting themselves and will probably report to you very shortly."

AN INTERESTING DECISION IN TANK CASE,

After hearing arguments on the petition of the Avery Portable Lighting Company, to restrain the Commercial Acetylene Company, Indianapolis, Ind., who are plaintiffs in the patent infringement action brought against the former concern in July last, from continuing to institute actions against buyers of the Avery apparatus, Judge Quarles, sitting in the U. S. Circuit Court of Milwaukee, Wis., rendered a decision prohibiting the plaintiff from bringing further suits against the customers of the Avery company until the validity of the patent had been passed upon.

WORK BEGUN ON MAXWELL-BRISCOE PLANT.

NEWCASTLE, IND., Dec. 29.—Work on the foundation of the new plant of the Maxwell-Briscoe Company is already under way here, the contract, which was formally awarded a few days ago, calling for the completion of the foundation within 60 days from date. It was let to Gubbins & Garvey, a local firm, and involves a total of about 1,200 cubic yards of concrete construction. Bidding for the work was brisk, a number of outside firms also submitting estimates.



HOW THE DINERS LOOKED WHEN CAUGHT BY THE CAMERA AT THE WYCKOFF, CHURCH & PARTRIDGE ANNUAL SPREAD.

SELDEN COMPANY BEGINS BUSINESS.

ROCHESTER, Dec. 31.—The Selden Motor Vehicle Company, which was incorporated December 24 with \$500,000 capital, called the first meeting of its stockholders late last week. The principal business of the meeting was the election of officers, those chosen being George B. Selden, president; L. A. Fischer and J. M. Walmsley, vice-presidents; Gilbert E. Mosher, treasurer, and R. H. Salmons, secretary. With the exception of L. A. Fischer, who hails from Buffalo, all of the officers are residents of Rochester. The directorate of the company will be composed of the above mentioned officers, besides George E. Foster, of the Foster-Armstrong Company, Frank A. Russell, of Rochester, and A. Snyder and A. G. Bartholomew, of Buffalo. Mr. Russell will be superintendent of the factory.

The manufacturing plant of the company will be at East Rochester, N. Y., where operations have already commenced for the erection of buildings covering over eight acres of ground. E. T. Birdsell, formerly connected with the Napier Company abroad, and who has been with the Decauville interests since coming to this country, will be the company's designer, and it said that he has been at work on the plans of a car for some time past in New York. He will continue the work from now on in the temporary offices opened in the German Insurance Building in Rochester. It is planned to place but a single model on the market during the coming year, though the company will also build a runabout later on. This first model will be a touring car listing in the neighborhood of \$4,500 to \$5,000, and no efforts will be spared to make of it as high-grade a vehicle as can possibly be turned out. Commercial vehicles will also be added to the factory's output in the course of time. The first car of the touring type to which the company expects to confine itself during the coming season is expected to be ready about June 1.

A license has been granted the company by the Association of Licensed Automobile Manufacturers, controlling the Selden patent, though for a time the spectacle was presented of an inventor unable to manufacture under his own patent. This arose out of the rule of the association that no license shall be granted until the applicant therefor has demonstrated its ability to manufacture automobiles of the standard required and has actually sold some of them. The license was first applied for a year ago, when the company was being promoted, but was then refused owing to inability to comply with these requirements. The license acquired was that formerly held by the Buffalo Gasoline Motor Co.

Though no details of the car to be built have been made public, it is said that its chief characteristic, so far as the motor is concerned, is that it will be equipped with a device providing an absolute safeguard against backfiring. This is the invention of George B. Selden, Jr. It seems that there have been numerous accidents from this cause in Rochester, one of them having ended fatally, which led to the invention of the device in question.

HYATT FIFTH "ANNUAL" AT THE WALDORF.

In anticipation of its "Fifth Frictionless Feast," which will be held during show week, January 12-19, or to be more exact, on Wednesday, January 16, in the Astor Gallery at the Waldorf-Astoria, Peter Severin Steenstrup, of the Hyatt Roller Bearing Company, who is chairman of the "Feast" committee, has sent out a neat little pamphlet recalling to mind the "Hyatt Idea" and abjuring the recipients to forego other engagements on that evening. Instead of the usual formal gorging with the prepared-in-advance "extemporaneous" speeches as a windup, there will be a continuous service of refreshments, solids and otherwise, from 9.30 P.M. to midnight, helped down by a continuous performance from 10 P.M. to 1 A.M.

Director Willy Tischbein of the Continental Caoutchouc & Rubber Company, Hanover, has received the Order of the Crown Class IV, from the German Emperor.

THE INCREASING GARAGE LIST.

The "Hub" to Have Another Motor Mart.

The New England Electric Cab Company, which now has its headquarters at the Park Square automobile station, is preparing to give Boston another mammoth garage somewhat similar in plan to the now well-known Motor Mart on Columbus avenue. Preparations have been made so quietly that the building was already in the course of construction before anything concerning it became public. It is situated in the Back Bay district, on Huntington avenue, directly adjoining Chickering hall. When completed this new garage will have three stories and basement, each containing 10,000 square feet of floor space. The basement will contain the washing department and machine shop, while a second set of washing machines will be installed on the first floor. Executive offices and chauffeurs' rooms will occupy the second floor, and storage for cars the third. The entrance will be in the center of the building and will be flanked by two large salesrooms. The enterprise is to be known as the Back Bay Motordrome, and will be under the management of W. H. Taylor, who was with the Park Square station for four years.

Copley Square Garage is Boston's Latest.

Boston is to have another motor mart, to be called the Copley Square Garage, and it is to be erected on the site of the old studio building on Irvington street, in the Back Bay, near Mechanics building. Work has already begun in clearing away the old structure to make way for the new garage. It is intended by the builders to make this a combination garage, sales headquarters and clubhouse. Suitable quarters for salesrooms are lacking in this city and as each new firm arrives on the scene it has increasing difficulty in finding a good site for a salesroom. It may be that the Copley Square garage will become headquarters for the unlicensed dealers. Negotiations have been made in an unofficial way looking toward the use of a part of the garage by the Bay State Automobile Association. The association is very well satisfied where it is, however, and as it has a long lease on its present clubhouse would probably decline to move, unless it would be materially benefited.

Detroit's Latest Modern Garage.

Although Detroit boasts of an automobile "row," the same as other cities, the garage business is not confined to it. Beyster & Thorpe, a partnership recently organized with \$25,000 capital to do a garage business, has erected a garage and salesroom way out in the best part of Detroit's residential district, 1329-1331 Woodward avenue, only a few blocks from the fifteen-mile Grand Boulevard. The building has a fifty-foot front, most of which is of plate glass, and has a depth of 100 feet. Every facility for the rapid and convenient handling of cars has been provided, the plan of the building being modern in every detail. The selling end will be confined to representing the Aerocar, and a large electric sign of the latter will be placed across the entire front of the garage later. The front and main entrance is shown in the illustration.



MAIN ENTRANCE BEYSTER & THORPE GARAGE, DETROIT.

COMPRESSED AIR FOR SELF-STARTING DEVICES

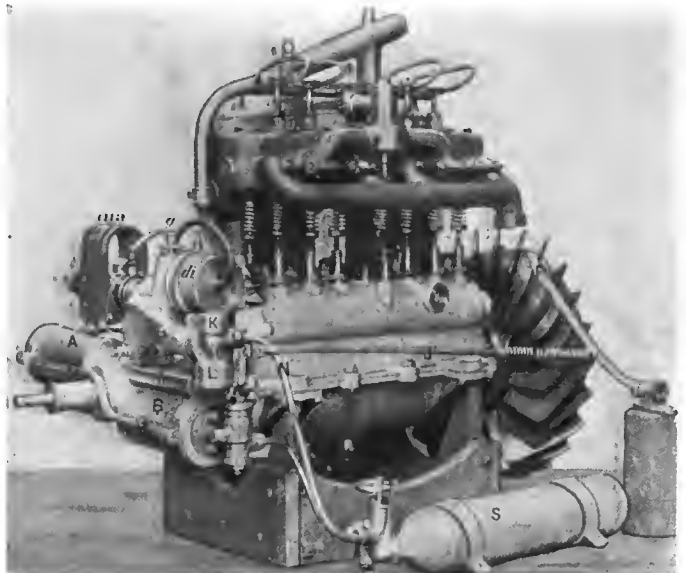
By CHARLES B. HAYWARD

EVER since the automobile reached a stage of development where its designer was at liberty to feel that the chief question of moment had ceased to be "will it run?" the necessity of some simple device to enable the driver to start the motor from the seat has made itself more and more apparent. Whether considered casually or closely investigated at close range, the problem is not one that should hold any particular difficulty. Power must be applied to turn the motor over until it takes up its own cycle, and this power may take any form that the designer considers simplest and most adaptable to the purpose. The only other essentials are that it shall be easily controlled from the seat and readily detachable from the motor shaft when the latter starts.

Ever since gas engines of high powers have been built, and they date back some time before the modern automobile, compressed air has been relied upon in the great majority of instances to get the engine under way. In one or two instances, such as that of the large multicylindered stationary engine built by the Wolseley Works for the General Electric Company, a cartridge containing gun powder is inserted in a breech provided for it and fired by pulling a lanyard—altogether a crude and antiquated device, as well as one totally unsuited for the purpose where frequent starting is necessary. Its use dates back a number of years; but, in the more or less infrequent instances in which it has been employed, it has had to give way to compressed air or something similar sooner or later.

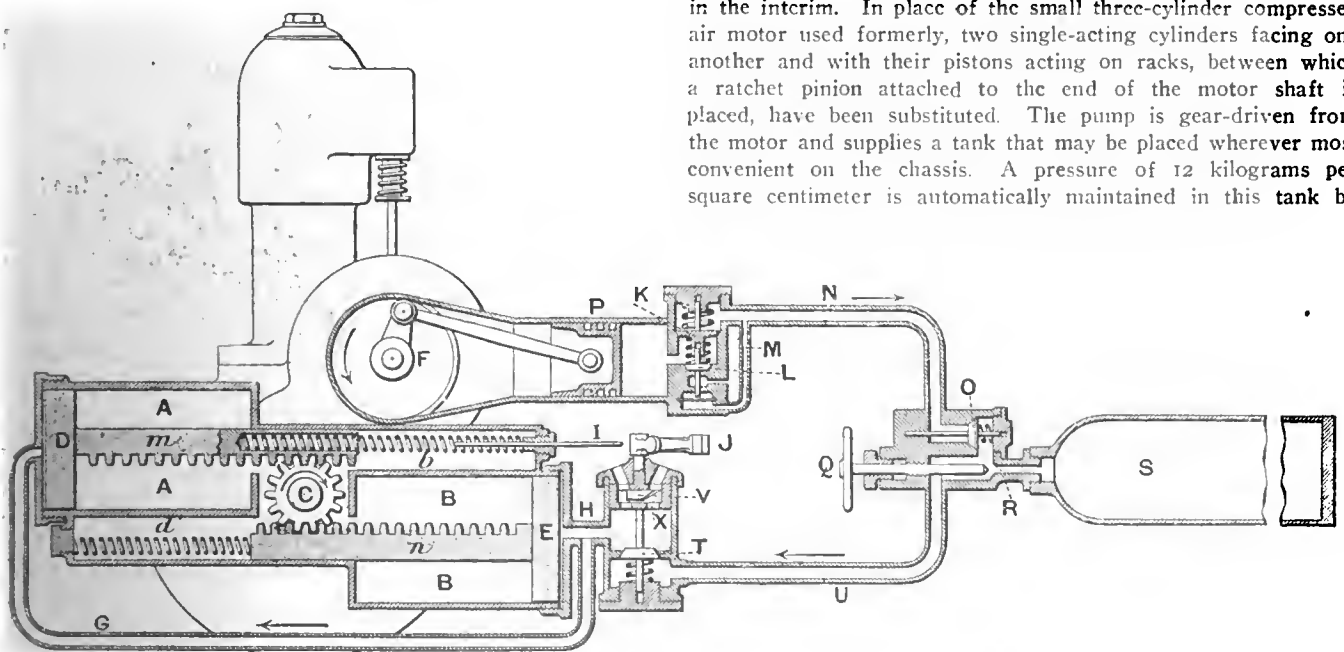
For starting an automobile three classes of devices seem to lend themselves most readily to the end in view. A hand lever operated from the seat, turning the motor over by human power in much the same way as is done with the crank at present; spring devices wound by the motor, and gas or air under compression, also maintained at the required pressure by the motor, though in some instances an independent reservoir has been utilized. It is evident that of all these the use of compressed air promises most, on the score of simplicity and reliability, next to the hand lever at the seat, which is merely the crank in another place. A form of starting large engines that has not been mentioned is that of employing a smaller motor of the same type to turn over the large one, but as this must be gotten under way in the usual manner, it has no bearing

on the problem whatever. Then, again, comparatively small engines of the stationary type have been on the market for years, in which self-starting is accomplished with compressed air generated by means of a hand pump, but this also is objectionable, beside which there is no necessity for resorting to hand power to generate the pressure in the case of the automobile motor. The muscular effort might better be expended directly at the crank handle.



HOW THE PUMP IS ATTACHED TO THE MOTOR.

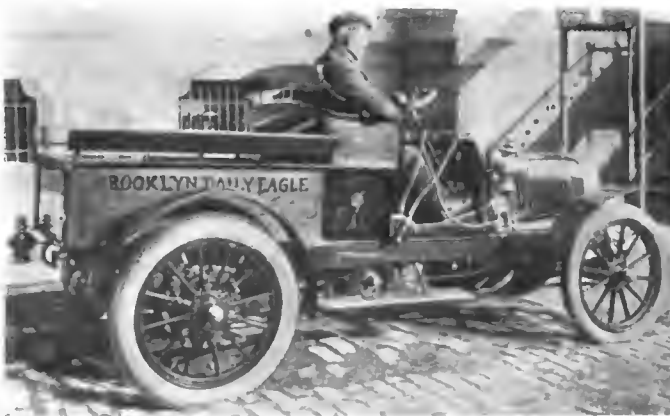
However it may be viewed, the problem inevitably seems to point to the use of gas or air under compression, the only question of moment being whether to inject it directly into the cylinder or employ it in the form of an auxiliary motor. The latter appears to represent the simplest form, a typical instance of this being found in the device employed on the Renault cars. This concern adopted compressed air for self-starting last year, but the device has been considerably improved in the interim. In place of the small three-cylinder compressed air motor used formerly, two single-acting cylinders facing one another and with their pistons acting on racks, between which a ratchet pinion attached to the end of the motor shaft is placed, have been substituted. The pump is gear-driven from the motor and supplies a tank that may be placed wherever most convenient on the chassis. A pressure of 12 kilograms per square centimeter is automatically maintained in this tank by



SECTIONAL ELEVATION SHOWING CONNECTIONS OF COMPLETE SELF-STARTING PLANT.

means of the pump and a diaphragm valve, permitting the escape of any excess. The method of operation is as follows: The lever *F* at the end of the camshaft (Fig. 1) drives the piston *P* through a connecting rod. The air intake is at *L*, while the compressed air reaches the tank through the valves *K* and *O* and the tube *N*. A needle valve *Q* is provided on the tank, and, when closed, maintains a supply of compressed air in the latter. The tank has a cubic capacity of six liters, which, at the pressure maintained, permits of starting the car six times in succession before exhausting it. The valve *Q* is allowed to remain open, except when the car is out of use.

In order to start, a pedal on the footboard is depressed, opening the valve *T* and allowing the compressed air to flow into the cylinders, thus forcing the pistons *E* and *D* outward. The two horizontal racks act on the pinion attached to the crankshaft of the motor. Having completed their stroke the cylinders are emptied by the rack *M*, which is hollow for a portion of its length, engaging the connecting rod *I* and tripping the lever *J*, which opens the valve *X* and empties the cylinders automatically, when the operation may be repeated by depressing the pedal again.



NEW DELIVERY AUTO OF THE BROOKLYN "DAILY EAGLE."

CREATING A LIGHT DELIVERY CAR.

There has been recently added to the automobile delivery force of the Brooklyn *Daily Eagle* a car which that enterprising journal recommends as a type especially suited for quick and effective work, where attractiveness in appearance is not to be lost sight of. The new creation consists of a regular Pope-Toledo chassis on which a special seat and body has been built by Flandreau. The illustration shows a very happy combination, which its users are extremely well pleased with after a practical test.

FREE REPAIRS FOR A YEAR ON 1907 CARS.

Many a would-be automobilist has undoubtedly been prevented from buying a car because of the haunting fear that the trouble and expense of keeping it in running order would be so great as to offset the pleasure derived from the use of the machine. Not very long ago there was very good reason for such fear; but the great improvements made in late years have made well-built cars exceedingly reliable. A striking indication of this fact is given in the statement made by the Quaker City Automobile Company, of Philadelphia, that 1907 cars bought from it will be kept in repair free of charge for a year, and each purchaser of a 1907 car is given a signed contract to this effect. This does not apply, of course, to damage caused by accident. The cars handled by this concern are the Pope-Toledo, Pope-Hartford, Pope-Waverly, Pope-Tribune, Franklin and Peerless, and the company's confidence in their quality is strikingly indicated by the free repair offer.



DIAMOND RUBBER CO.'S CAR FOR PRACTICAL DEMONSTRATIONS.

A PRACTICAL TIRE TRY-OUT TRIP.

AKRON, O., Dec. 31.—As a means of presenting by practical performance the merits of the Marsh Rim and Diamond Quick Detachable Tire the Diamond Rubber Co. has put a car on the road expressly for this purpose. Notwithstanding severe weather and bad roads, the Diamond demonstrators have made rapid progress from place to place, and the health-giving qualities of automobiling, even in winter, are evidenced by the fact that the men have gained perceptibly in weight in a very short period. The record of the Marsh rims on this car has been gratifying to the Diamond company.

WASHINGTON'S PROSPEROUS YEAR'S TRADE.

WASHINGTON, D. C., Dec. 29.—Prosperity and general trade expansion have been the distinguishing features of the automobile trade in this city during the year just closing. It can be truthfully said that this statement is an accurate description of the local trade during the year. Whatever is said beyond this is merely elaboration. Everybody has been unusually prosperous and will close the year with substantial balances on the right side of the ledger. It is estimated that fully 500 automobiles of all descriptions were sold here during the year. Electrics have made great headway during the year.

The Commercial Automobile and Supply Company has removed from 715 Thirteenth street to 1313 New York avenue, a large three-story building that was remodeled for the use of the company. Wayne and Logan cars will continue to be handled.

The work of remodeling the building at 1315 New York avenue for the Motor Car Company, agents for the Peerless, Thomas and Stevens-Duryea, is progressing rapidly.



A QUAKER CITY SIGN THAT TELLS ITS OWN STORY

NEWS AND TRADE MISCELLANY.

Following the annual custom of playing Santa Claus, Harry Houpt, the New York Thomas representative, distributed among his two hundred employees and the chauffeurs who store their cars in his garage, a ton of turkeys as Christmas presents.

Owing to the great increase in its business, the Auto Brass Company, Columbus, O., makers of lamps and accessories, intends to build a plant of its own during the coming season. George Hill is the president and M. B. Lee the general manager.

Raymond S. Joo, whose Frayer-Miller car came out victorious in the recent endurance test that started off as an economy run, and who represents the Frayer-Miller interests in northern New Jersey, has just removed to a new garage at 79 Orange street, Newark.

The Cornish-Friedberg Automobile Company, representing the Aerocar and other lines in Chicago, has just moved into a specially constructed garage building at 1233 Michigan avenue. It is two stories high and is one of the most complete establishments on the row.

Charles Howard Tucker, formerly manager of the Chicago branch of the Wintou Motor Carriage Company, is the designer of the new Chicago production, the Triumph car. The company building it expects to be able to have at least 100 touring cars on the road during the coming season.

The Autocar Company has just leased the premises consisting of the corner store and basement at Eightieth street and Broadway for a term of years. The building is a new one, and as soon as the necessary fittings can be installed the New York branch of the Autocar Company will occupy its new location.

The Auto Vehicle Company, of Los Angeles, Cal., will expand to a considerable extent on the completion of its three-story brick structure to be erected at the corner of Tenth and Los Angeles streets, the contract for which has just been awarded. The factory of the company is now situated at Tenth and Main streets.

The recently incorporated Star Automobile Company, of Chicago, which will manufacture light gasoline runabouts, is looking about for a favorable location for its factory. Marion, Ind., on the other hand, would welcome a further increase in its automobile manufacturers, and it is probable that this city may be selected.

George H. Earle, Jr., president of the Real Estate Trust Company, of Philadelphia, one of the Quaker City's veteran automobilists, has placed his order for a 1907 Autocar. Mr. Earle has owned every type of Autocar that has been built, and although he owns a number of foreign machines, is very loyal to the production of the Ardmore factory.

The eight cars of the new Pope-Toledo Livery Company, which has its headquarters in the Orlando F. Weber garage, at 1322 Michigan avenue, Chicago, have been kept busy ever since the company started in business about ten days ago. The officers of the company are Charles Weber, president; Alfred Reeke, secretary-treasurer, and Harry Griffin, manager. Five of the cars are of the open touring type and the other three are well fitted limousines.

The Maxwell-Briscoe Motor Company, of Tarrytown, N. Y., has purchased the entire edition of "The Making of an Automobilist" and is selling the book almost at cost, the price asked being 50 cents. The

idea is that users of Maxwell or any other cars can learn a great deal about the handling and care of their machines from this practical book, and that its distribution in this way will be of benefit to the automobile movement generally.

Oakland, Cal., has purchased for the use of Chief Ball, of the fire department, a Columbia 24-28 horsepower runabout. The chief insisted on being "shown" what the car possessed in the way of staying qualities, hill-climbing ability, speed, etc., and the sale was made by the Middleton Motor Car Company, Pacific Coast representatives of the Electric Vehicle Company, who recently secured the order from the city of Oakland for a Columbia electric police patrol.

At a meeting of the directors of the recently incorporated Shoemaker Automobile Company, of Freeport, Ill., it was decided to increase the capital stock of the concern to \$100,000, divided into 4,000 shares at \$25 each. Although one of the objects set forth in the incorporation papers is that of manufacturing automobiles, it is expected that the company will confine itself to do a general selling and garage business. A building on Exchange street has been leased.

✓ The Welch Motor Car Company has just awarded a contract to the Slater Construction Company for the erection of a building for manufacturing purposes in Pontiac, Mich. The new factory will measure 100 by 250 feet and will be modern in every detail. The contract calls for its completion at the end of sixty days and as soon as ready new machinery will be installed in it, tripling the capacity of the Welch company to turn out cars. Its present plant has been running night and day.

Just to show what field there is for automobiles, the American Motor Car Association has just issued some of the records of the Census of Manufacturers for 1905, which show that during that year 6,000 carriage and wagon builders in this country turned out 1,700,000 horse-drawn vehicles, valued at \$97,000,000. Family and pleasure carriages numbered 940,000, valued at \$57,000,000, while business and farm wagons were made to the number of 644,000, worth \$37,000,000. There were 127,000 sleighs made.

James M. Mills, who represents the Cadillac interests in and about Newark, O., recently extended an invitation to every one of the owners of that make of car in that enterprising city to attend a dinner in honor of the success of the car during the past year. There are 55 Cadillac owners in Newark, and each was invited to come and bring a guest. The dinner was preceded by a theater party and followed by a recital of their experiences on the part of the guests. The affair was well attended and proved most enjoyable.

The successful Grand Central Palace show, and unusual activity of the American Motor Car Manufacturers' Association, has tended to increase the interest in its affairs which is resulting in added membership strength. A number of applications are now in the hands of the membership committee and last week two concerns were elected to the roll, which now numbers 41 manufacturers of motor cars. The two new members are the Abendroth & Root Manufacturing Company, makers of the Frontenac, and the York Motor Car Company, of York, Pa., makers of the Pullman.

Recent amendments to the constitution of the American Automobile Association have been drafted with a view to benefiting autoists who are not attached to any other organization. In accordance with the new regulations, any one now taking out an individual membership, the cost of which is still \$2 per annum, will not only receive the usual benefits but his name will also be sent to the state organization where he resides. This, together with the new ruling that henceforth any one hundred members of the national body may combine to organize a state association where at present there is none, should prove an incentive that will bring about a large increase in the membership of the association.

The Knox Automobile Company, of Springfield, Mass., one of whose cars is used in that city by the fire department for carrying chemical apparatus, tools and men rapidly to fires, has arranged with the Combination Ladder Company, of Providence, R. I., large manufacturers of chemical fire extinguishers, to place on the market a stock model of this fire-fighting automobile. The machine will consist of a Model G chassis with four-cylinder 35-40-horsepower motor, carrying two 35-gallon chemical tanks, the paraphernalia usually carried by such wagons and the men necessary to properly handle the apparatus. The first model of this interesting machine will be exhibited at the Madison Square Garden show, in the commercial vehicle section.

NEW AGENCIES ESTABLISHED.

The agency for the Dragon car for Minnesota's Twin Cities and vicinity has been placed with the Auto Selling and Repair Company, of Minneapolis.

The Pacific Commercial Car Company has been organized at Seattle, Wash., with a capital stock of \$25,000, and will handle the Cartercar. The incorporators are E. R. Wheeler, L. E. Younnie and Albert Armstrong, all of Tacoma, Wash. Salesrooms and garages will be maintained in both Seattle and Tacoma.

E. E. Cole, for several years connected with the Boston branch of the Wintou Motor Carriage Company, has gone with the Franklin interests in that city. The latter concern expects to occupy its new quarters, at 671-673 Boylston street, about the first of the year. The new salesroom is directly opposite the Public Library.

The Autocar Company, of Ardmore, Pa., has this week closed contracts for 1907 with the following dealers: Youngs & Co., Newburgh, N. Y.; Frank P. Freeman, Rahway, N. J.; the Auto Company, Paterson, N. J.; August Stocker, Salt Lake City; the Cook Automobile Company, Portland, Ore., and the Broadway Auto Co., Seattle, Wash.

Wishing to extend their business into the Dominion, which is known to represent an excellent field for high-grade cars, the F. B. Stearns Company, Cleveland, O., makers of the Stearns cars, are desirous of getting in touch with responsible dealers in various parts of Canada, especially in such cities as Toronto and Montreal, in order to establish agencies for the coming year.

The Northwestern Cadillac Company has been formed to handle the Cadillac line in Minnesota, North and South Dakota, with headquarters in Minneapolis. They have opened a garage at 316-322 Fourth avenue, south, where a complete stock of supplies and parts will be carried and a general repair business conducted. The Waverley electric line will be handled for the city of Minneapolis. L. E. Horton is manager of the new company.

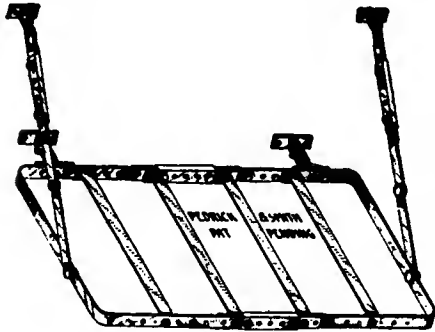
PERSONAL TRADE MENTION.

W. E. Decker, lately with the Maxwell-Briscoe Buffalo Company, has been transferred to the selling department of the Maxwell-Briscoe Co., Inc., New York.

P. A. Williams, who was manager of one of the departments of the Overman Wheel Company in the old bicycle days, and has since been connected with the automobile industry as representative of the Orient, Ford and Marion lines in Boston since 1903, later going with the Aerocar Company, has just been appointed sales agent of the runabout department of the Knox Motor Truck Company, of Springfield, Mass. The car is the Atlas, two cylinder, two-cycle runabout of 20 horsepower, which was in evidence at the recent show, together with the heavy two-cycle commercial vehicle staged by the same firm.

AN ADJUSTABLE BAGGAGE RACK.

Adjustability to every size of car, great or small, is the leading feature of the new baggage rack just placed upon the market by Pedrick & Smith, Church lane, Germantown, Philadelphia, an illustration of which is printed below. It is made of pressed steel throughout and is attached to the back of the seats by brackets. Both the



P. & S. ADJUSTABLE BAGGAGE RACK.

main framework, on which the baggage rests, and the two side supports, are adjustable as to length, this feature being the prime requisite in fitting it to the various sizes of cars. The rack, with its load, is carried well above the deck, so that this can be removed for inspecting the mechanism of the car without disturbing the baggage. When there is nothing to be carried, the rack folds up against the back of the seat and is entirely out of the way, yet ready for instant use. The rack is made in sizes suitable for all standard cars, and its length can be adjusted to suit individual requirements by means of the sliding arrangement in the main frame members. The P. & S. baggage racks are finished in black enamel and are exceedingly strong and durable.

TWO HAYES NOVELTIES.

An auto that does not drop oil on the floor of the garage is a rare thing, and to the man who has a private garage and likes to keep it clean this is a sore point. For just such service the Hayes Manufacturing Company, of Detroit, Mich., has placed on the market a floor pan of heavy galvanized iron, 30 inches wide and 94 inches long; angle iron stiffening strips are riveted to the bottom and casters are provided to make moving it about an easy matter. Besides the regular size mentioned, special sizes are made.

The same concern is turning out metal boxes for batteries and for tools. The

front, back, and bottom of each box are made from a single piece and the ends are set in and double seamed. The cover has wired edges and the edges of the body are also wired. Brass hinges, locks, hasps, and staples are fitted, or else there is a brass loop on the cover through which a strap may be passed. The standard size is 8 1-2 inches wide, 10 inches high, and 16 1-2 inches long. When used for a battery box a light wood lining is put in. Two storage batteries can be carried in one box, or else one storage battery and one set of dry cells. The finish is black enamel, baked on at a high temperature. Special sizes are made to order.

GISHOLT'S AMERICAN LATHE.

In these days of high-speed methods machine tools must be made to take heavy cuts without springing or chattering, for otherwise the finished work will lack accuracy and the best speed cannot be realized in its production. The accompanying illustration shows a good example of a heavy special lathe manufactured for the Gisholt Machine Company, of Madison, Wis., by the J. Morton Poole Company, of Wilmington, Del. The lathe is of the semi-automatic turret type, and is made with and without the gap bed. The manufacturers state that it is particularly adapted to machining flywheels, and that it is used in a number of automobile manufacturing establishments.

The massive construction of the machine is at once apparent. The bed is of very deep section and the headstock is cast integral with it, the maximum stiffness being thus obtained. The spindle is of large diameter and is ground absolutely true on dead centers; it is bored with a 2 3-8-inch hole and runs in heavy bronze bearings arranged with concentric adjustment for wear so that when such adjustment is made the spindle will not be thrown out of alignment. Four ratios of double back gear are provided in the driving gearing, as well as two ratios of quadruple back gear; with the two-speed countershaft this gives no less than thirty-six spindle speeds. There are eight feed rates, varying from two to thirty-five cuts to the inch. The driving belt is four inches wide. The turret is large and heavy and affords a wide base to steady the tools in taking heavy cuts. On the standard machine, which has a swing of 24-27 inches, the turret is 35 inches in diameter across flats; the turret faces are 8 inches high. The turret

has a traverse of 54 inches. The chuck is 24 inches in diameter. The swing over the turret slide is 8 inches. The American lathe is also made with 24-27-inch swing, this size having no gap. The weight of the machine is about 8,700 pounds.

RECENT INCORPORATIONS.

H. S. Hout Company, New York; capital, \$300,000. Incorporators, E. M. Hout, F. J. Titus and A. S. Robinson.

The American Motor Company, Eau Claire; capital, \$15,000. Incorporators, C. T. Bundy, Roy P. Wilcox, and Hannah F. Johnson.

Jackson Motor Car Company, Brooklyn, New York; capital, \$20,000. Directors, C. M. Herring, H. W. Palmer and F. H. Palmer.

Pope-Toledo Automobile Livery, Chicago, Ill.; capital, \$5,000. To deal in automobiles and supplies. Incorporators, Alfred Reeke, Harry G. Griffin and Charles Weber.

Model Machine Works, Frankfort, Ind.; to manufacture and repair automobiles; capital stock, \$10,000. Incorporators, Jos. Palmer, Chalmer H. Hillis and Andrew A. Laird.

Cincinnati Motor Car Dealers' Company, Cincinnati, O.; capital, \$5,000. Incorporators, Joseph T. Monfort, Charles Hanauer, Sid Black, Robert C. Crowthers and James H. Ratcliffe.

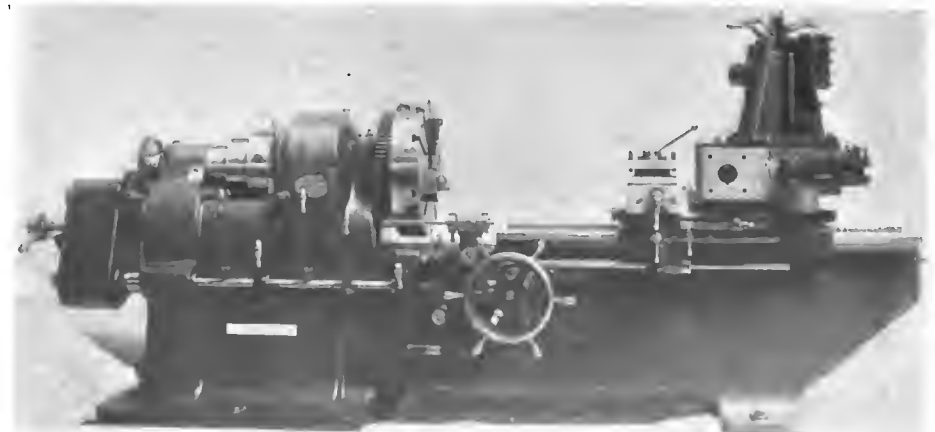
Halfeld Motor Vehicle Company, Scranton, Pa.; capital, \$50,000. To manufacture motor and self-propelled vehicles. Incorporators, C. B. Halfeld, C. B. Halfeld, Jr., Cortland; C. H. Pond, Scranton, Pa.

The Allegheny Motor Vehicle Company, Trenton, N. J.; capital, \$50,000. To manufacture and deal generally in automobiles. Incorporators, E. L. Kerns, W. Harry Williams and Walter G. Reinman.

Baird-Banks Manufacturing and Supply Company, New York; to manufacture and deal in automobile and motor boat supplies; capital, \$25,000. Incorporators, Milan E. Baird, George E. Banks and William James.

The Electrical Switch Plate Company, Hartford, Conn.; capital stock, \$50,000. To manufacture and sell switch plate. Incorporators, John Alexander, William H. Miller, Daniel H. Judd and Francis H. Peabody, of Hartford, and Oscar E. Joss, of New Haven.

Dealers' Automobile Exchange and Development Company, Rahway, New Jersey; capital stock, \$125,000. To buy, sell and deal in automobiles. Incorporators, Charles W. Nichols and Samuel D. Mershon, Rahway; and Herbert W. Walker, New York.



SEMI-AUTOMATIC TURRET LATHE, MADE BY THE GISHOLT MACHINE COMPANY.

THE AUTOMOBILE

VOL. XVI.

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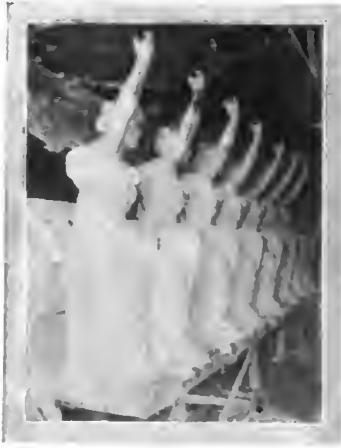
No. 2

MADISON SQUARE GARDEN'S SEVENTH SHOW

NOW the annual automobile show in Madison Square Garden. This world-known structure has been the scene of many events, but the 1907 affair of the Licensed Association of Automobile Manufacturers will set a new standard for the only well arranged structure possessed by the metropolis of the country—a building utterly inadequate to meet the astonishing demands of an industry that in the short space of six years requires two national shows in New York City in order to present its product, and even then twice as much display space could be utilized were it obtainable. The "Garden Show" embraces the pioneers, with few exceptions, and the present trend of American practise finds more general expression in the Selden camp than could be expected from any body which included many newcomers in automobile manufacture. Two hundred and sixty-five separate exhibits will be the Garden total, including the cars of the members of the Association of Licensed Automobile Manufacturers, the importations of the Importers' Automobile Salon and the quiet-running productions of the Association of Electric Vehicle Makers, and, in addition, the diversified showings of the firms belonging to the Motor and Accessory Manufacturers, Inc. Never before has the Garden show been so thoroughly departmentized. On the main floor and elevated platforms there will be the gasoline, domestic and foreign, pleasure cars; in the café the electrics will repose, and down

in the basement the ponderous commercial carriers and some of the overflow accessories will be found. Incidentally it might be mentioned that a rathskeller at the Fourth avenue end will provide a gathering place for those socially inclined. The greater part of the accessory and sundry concerns will be distributed through the concert hall, on the mezzanine platform, and in the gallery. Never has the Garden been subjected to such a thorough rejuvenation; it simply will not be recognized by its patrons of many years' standing. The Publicity Department described the decorative scheme as resembling "a Swiss palace in Autumn"—exactly what that might be is something of a mystery. Nevertheless, the transformation has been artistically accomplished, and one is easily inclined to utilize gorgeous adjectives in telling of the beauty of the place. Snowy peaks, tawny fields and amber skies are depicted in the huge paintings at the end and sides, while heroic statues and fountains add to the general effect with its Alpine complexion. 'Tis said that \$75,000 has been expended in supplying the garb of the Garden, which certainly presents a harmonious and symmetrical plan of decoration, with its uniform signs and lights. Certainly the "Goddess of the Show" and her sisters gaze upon a scene unlike that which ever before has served as a setting for an industrial entertainment. "Prosperity," "Triumph" and "Mercury" are typical figures which would seem to belong in the capacious amphitheater.





SOME OF THE SHOW GIRLS

Nearly 150 different models will be presented, ranging from the costliest down to the reasonable little run-about; they will be water-cooled and air-cooled; of eight, six, four and two cylinders; in limousine, landaulet, touring car and run-about form; in fact, the man who cannot be suited will certainly be difficult to please, and the captious will find variations in equipment that will keep him busy for several visits to the big building. Not a nook nor a cranny in the Garden has been left un-

tenanted, but all the occupants are related in one way or another to the commanding auto in its victorious speed march.

Forty-three different makes of gasoline cars will be represented, with eight electrics interspersed and eleven commercial trucks contributed to preserve the equilibrium. The foreign cars will be direct from the Paris Salon, and of course 1907 models beyond question. This is the car list of exhibitors:

AMERICAN GASOLINE.

Apperson,	Locomobile,	Pope-Tribune,
Autocar,	Lozier,	Royal Tourist,
Buick,	Matheson,	Simplex,
Cadillac,	Northern,	Stearns,
Corbin,	Oldsmobile,	Stevens-Duryea,
Columbia,	Packard,	Studebaker,
Elmore,	Peerless,	Thomas,
Franklin,	Pierce Great Arrow	Walter,
Haynes,	Pope-Hartford,	Waltham-Orient,
Hewitt,	Pope-Toledo,	Winton.
Knox,		

FOREIGN GASOLINE.

C. G. V.,	Clément-Bayard,	Hotchkiss,
English Daimler,	Fiat,	De Dietrich,
Panhard,	Rochet-Schneider,	Isotta-Fraschini.
Renault,	Darracq,	

ELECTRIC.

Babcock,	Baker,	Columbia,
Columbus,	Cantono,	Gallia.
Pope-Waverley,	Studebaker,	

COMMERCIAL VEHICLES.

Champion,	Franklin,	Pope,
Knox,	Northern,	Hewitt,
General Vehicle,	Waverley,	Studebaker.
	General Electric.	

GEORGES DUPUY'S EUROPEAN TOUR IDEA.

American manufacturers have been invited to attend a preliminary meeting at which will be discussed Georges Dupuy's "cooperative commercial invasion of Europe by the allied automobile manufacturers of America under the guise of a road and endurance contest for a gold cup." The session will take place at the rooms of the New York Motor Club, Fifty-eighth street and Eighth avenue, January 15, at 11 A. M. Mr. Dupuy outlines a tour that would include France, Spain, Italy, Austria-Hungary, Germany, Belgium and England, occupy about eight or ten weeks, and include at least fifty American cars.

EVENTS SCHEDULED FOR SHOW WEEK.

Sunday, Jan. 13, 8 P. M.—Smoker of New York Motor Club, Reisenweber's, No. 300 West Fifty-eighth street.

Tuesday, Jan. 15, 10:30 A. M.—Monthly meeting Mechanical Branch A. L. A. M., No 7 East Forty-second street.

Wednesday, Jan. 15, 10:30 A. M.—Continuation meeting Mechanical Branch A. L. A. M., No. 7 East Forty-second street.

Wednesday, Jan. 16, 11 A. M.—Annual meeting of National Association of Automobile Manufacturers, Victoria Hotel, Broadway and Twenty-seventh street.

Wednesday, Jan. 16, 9:30 P. M.—Hyatt Roller Bearing Company, "Fifth Frictionless Feast," Astor Gallery, Waldorf-Astoria Hotel.

Thursday, Jan. 17, 2 P. M.—Annual meeting of Society of Automobile Engineers, New Grand Hotel, Broadway and Thirty-first street. Annual dinner, same place, 7:30 P. M.

Thursday, Jan. 17, 3:30 P. M.—Annual meeting of A. A. A. at new A. C. A. clubhouse, No. 249 West Fifty-fourth street.

Friday, Jan. 18, 10:30 A. M.—Meeting of New York State Automobile Association, new A. C. A. clubhouse, No. 249 West Fifty-fourth street.

THE FOUR WHO DID MOST OF THE WORK.

Col. George Pope, chairman of the show committee, has been prominent for years in the bicycle and automobile industry. As treasurer of the Pope Manufacturing Company he had to do with the growth of the motor car industry from its birth and with the promotion of all the shows. He is a man of unusual personal popularity, and his word is taken as a bond throughout the trade. As a presiding officer he has a judicial character which brings discussions to a practical focus.

Marcus I. Brock is one of the forceful men of executive ability. He is the assistant general manager of the Association of Licensed Automobile Manufacturers, in which position he has made himself conspicuous by his handling of heavy responsibilities. Previous to taking his present position he was for a number of years the sales manager of the Autocar Company.

Carleton R. Mabley is of the firm of Smith & Mabley, the first regular importing firm established and now one of the largest importers, besides being manufacturers of an American car. As a close student of the Paris shows, Mr. Mabley brings much valuable knowledge to the conferences of the committee.

Merle L. Downs, secretary of the committee, has been prominent in various ways in the industry and with the work of various organizations. He is known for his work in managing several of the big tours, such as the one to Pittsburg in 1903, and that to St. Louis in 1904, and the Glidden tour of 1905. He is now regularly connected with the A. L. A. M. and most of the burden of detail work in connection with the show falls upon him, as upon secretaries generally.



NAIAD WITH DOLPHIN ON FOUNTAIN.

WHERE THE VARIOUS EXHIBITORS HOLD FORTH

IT is something of a task nowadays to thoroughly "do" an auto show, and the average visitor is first inclined to examine that which appeals to him particularly and then more leisurely wander up and down the aisles, climb to the galleries, and descend to the basement. He may have in mind the buying of a new car, or he may be a pioneer who wants something that is exactly up-to-date, and these are the men who have an object

in mind as soon as they enter the building. Some have a penchant for tires; others want the road well lighted and make for the lamp exhibits; ignition is always a fruitful source of investigation for the old timer, and everyone wants to know how far he has gone and also how fast he is going. Specialties of all kinds add to the grand total, and therefore the accompanying classification will be a great time-saver, as well as a convenience.

AMERICAN GASOLINE PLEASURE VEHICLES

Apperson Brothers Auto Co.....	Elev. Platform 35
Autocar Co.....	Main Floor 24
Buick Motor Car Co.....	Main Floor 6
Cadillac Motor Car Co.....	Main Floor 5
Corbin Motor Vehicle Corp.....	Exhib. Hall 39
Electric Vehicle Co.....	Main Floor 20
Elmore Mfg. Co.....	Main Floor 7
H. H. Franklin Mfg. Co.....	Main Floor 22
Hewitt Motor Co.....	Elev. Platform 33
Knox Auto Co.....	Elev. Platform 29
Haynes Auto. Co.....	Main Floor 4
Locomobile Co. of America.....	Main Floor 27
Lozier Motor Co. of New York.....	Elev. Platform 30
Matheson Motor Car Co.....	Elev. Platform 37
Northern Motor Car Co.....	Main Floor 2

Olds Motor Works.....	Main Floor 8
Packard Motor Car Co.....	Main Floor 18
Peerless Motor Car Co.....	Main Floor 23
Geo. N. Pierce Co.....	Main Floor 28
Pope Mfg. Co.....	Main Floor 25
Pope Motor Car Co.....	Main Floor 26
Royal Motor Car Co.....	Main Floor 1
Smith & Mabley, Inc.....	Main Floor 15
F. B. Stearns Co.....	Elev. Platform 36
Stevens-Duryea Co.....	Main Floor 21
Studebaker Auto Co.....	Elev. Platform 31
E. R. Thomas Motor Co.....	Main Floor 19
Walter Auto Co.....	Elev. Platform 32
Waltham Mfg. Co.....	Elev. Platform 34
Winton Motor Carriage Co.....	Main Floor 17

IMPORTED GASOLINE PLEASURE VEHICLES

Archer & Co.....	Main Floor 11
Auto Import Co.....	Main Floor 12
Sidney B. Bowman Auto Co.....	Main Floor 13
Darracq Motor Car Co.....	Main Floor 10

De Dietrich Import Co.....	Main Floor 9
Hol-Tan Co.....	Main Floor 16
Smith & Mabley, Inc.....	Main Floor 3
Wyckoff, Church & Partridge.....	Main Floor 14

AMERICAN ELECTRIC PLEASURE VEHICLES

Babcock Electric Carriage Co.....	Exhib. Hall 41
Baker Motor Vehicle Co.....	Exhib. Hall 45
Columbus Buggy Co.....	Exhib. Hall 38
Cantono Electric Forecarriage.....	Exhib. Hall 44

Electric Vehicle Co.....	Exhib. Hall 43
Pope Motor Car Co.....	Exhib. Hall 42
Studebaker Auto Co.....	Exhib. Hall 40

THE TIRE-MAKERS

Aster Co.....	Basement 191
Ajax-Grieb Rubber Co.....	Concert Hall 165
Continental Caoutchouc Co.....	Second Tier Boxes 232
Consolidated Rubber Tire Co.....	Mezzanine Floor 83
Diamond Rubber Co.....	Mezzanine Floor 46
Dow Tire Co.....	Basement 213
Electric Rubber Mfg. Co.....	Basement 187
Firestone Tire & Rubber Co.....	Mezzanine Floor 75
Flisk Rubber Co.....	Mezzanine Floor 91
G & J Tire Co.....	Mezzanine Floor 51
B. F. Goodrich Co.....	Mezzanine Floor 97
Goodyear Tire & Rubber Co.....	Mezzanine Floor 48
Harburg Tire Co.....	Basement 229
Hartford Rubber Works Co.....	Mezzanine Floor 96
International Rubber Co.....	Mezzanine Floor 89
Leather Tire Goods Co.....	Third Tier Boxes 252
Morgan & Wright.....	Mezzanine Floor 68
Motz Clincher Tire & Rubber Co.....	Basement 198
Pennsylvania Rubber Co.....	Mezzanine Floor 85
Republic Rubber Co.....	Mezzanine Floor 70
R. & P. Traction Tread Tire & Tube Co.....	Basement 203
Samson Leather Tire Co.....	Basement 216
Trident Tire Co.....	Basement 199
Voorhees Rubber Mfg. Co.....	Gallery 152

NON-SKIDS, TIRE COVERS, ETC.

Allen Auto Specialty Co.....	Second Tier Boxes 245
Gilbert Mfg. Co.....	Gallery 137
Hopewell Bros.....	Gallery 150
Weed Chain Tire Grip Co.....	Gallery 141

LUBRICATING OILS AND GREASES

Dixon Crucible Co.....	Gallery 106
A. W. Harris Oil Co.....	Gallery 133
Havemeyer Oil Co.....	Second Tier Boxes 232
Vacuum Oil Co.....	Gallery 130
John T. Stanley.....	Basement 211
Harrington Lubricant Co.....	Second Tier Boxes 253
Adam Cook's Sons.....	Second Tier Boxes 241
N. Y. & N. J. Lubricant Co.....	Mezzanine Floor 59
W. C. Robinson & Son Co.....	Gallery 131
O. W. Young.....	Gallery 117

COMMERCIAL VEHICLES—GASOLINE

H. H. Franklin Mfg. Co.....	Basement 180
Hewitt Motor Co.....	Basement 183, 219
Knox Auto Co.....	Basement 179

COMMERCIAL VEHICLES—ELECTRIC

General Vehicle Co.....	Basement 185
Pope Motor Car Co.....	Basement 178
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BEARINGS

American Ball Bearing Co.....	Mezzanine Floor 88
J. S. Bretz Co.....	Second Tier Boxes 247
Hyatt Roller Bearing Co.....	Mezzanine Floor 92
Hess-Bright Mfg. Co.....	Concert Hall 157
Timken Roller Bearing Axle Co.....	Mezzanine Floor 81
Steel Ball Co.....	Mezzanine Floor 64

BATTERIES

American Elec. Novelty & Mfg. Co.....	Concert Hall 158
Eastern Carbon Works.....	Gallery 110
Electric Storage Battery Co.....	Second Tier Boxes 248
Franco-American Supply Co.....	Basement 189
Gould Storage Battery Co.....	Basement 226
Kitsee Storage Battery Co.....	Basement 195
Motor Car Specialty Co.....	Gallery 138
National Battery Co.....	Concert Hall 163
National Carbon Co.....	Mezzanine Floor 65
National Sales Corp.....	Basement 215
Semi-Dry Battery Co.....	Third Tier Boxes 262
Stackpole Battery Co.....	Gallery 143
Vesta Accumulator Co.....	Gallery 151
Witherbee Igniter Co.....	Gallery 144

SHOCK ABSORBERS

Diezemann Shock Absorber Co.....	Gallery 132
Graham & Goodman, Inc.....	Basement 207
Hartford Suspension Co.....	Mezzanine Floor 77
P. M. Hotchkiss.....	Third Tier Boxes 260
Kilgore Auto Air Cushion Co.....	Mezzanine Floor 69
J. H. Sager Co.....	Gallery 116
Vestal Shock Absorber Co.....	Gallery 108

SPEEDOMETERS AND ODOMETERS

Hoffecker Speed & Mile Register Co..... Concert Hall 176
 Hopewell Bros..... Gallery 150
 Jones Speedometer Co..... Mezzanine Floor 84
 Lipman Mfg. Co..... Gallery 129
 Charles E. Miller..... Mezzanine Floor 101
 Motor Car Specialty Co..... Gallery 138
 Oliver Instrument Co..... Gallery 104
 Post & Lester Co..... Mezzanine Floor 98
 R. H. Smith Mfg. Co..... Gallery 134
 S. Smith & Son, Ltd..... Basement 217
 Veeder Mfg. Co..... Mezzanine Floor 53
 Warner Instrument Co..... Mezzanine Floor 90
 Webb Mfg. Co..... Mezzanine Floor 66
 Winchester Speedometer Co..... Mezzanine Floor 72

MAGNETOS AND DYNAMOS

Dayton Electrical Mfg. Co..... Mezzanine Floor 50
 Motalinger Auto Device Mfg. Co..... Mezzanine Floor 63
 Pittsfield Spark Coil Co..... Mezzanine Floor 47
 Remy Electric Co..... Mezzanine Floor 61
 Robert Bosch, N. Y. Inc..... Basement 214
 Lavalette & Co..... Basement 212
 Leon Rubay..... Basement 93
 Sibley & Pitman..... Basement 197
 Albert Champlon Co..... Basement 190
 Holley Brothers Co..... Mezzanine Floor 73
 C. F. Spltdorf..... Mezzanine Floor 49

GEARS, AXLES, DIFFERENTIALS, PARTS, ETC.

Brown Lipe Gear Co..... Mezzanine Floor 56
 Direct Drive Axle Co..... Concert Hall 155
 Standard Brake Co..... Basement 210
 Timken Roller Bearing Axle Co..... Mezzanine Floor 81
 Warner Gear Co..... Mezzanine Floor 82
 Hartford Auto Parts Co..... Gallery 103
 Muncie Auto Parts Co..... Gallery 109
 Globe Machine & Stamping Co..... Gallery 148
 Gemmer Engine Co..... Concert Hall 170
 Carpenter Cap Screw Co..... Second Tier Boxes 243

WIRE CABLE, TIMERS, PLUGS, AMMETERS, ETC.

Aster & Co..... Basement 191
 Atwater-Kent Mfg. Co..... Gallery 145
 T. Alton Bemus, Inc..... Third Tier Boxes 257
 E. M. Benford..... Gallery 149
 J. S. Bretz Co..... Second Tier Boxes 247
 Byrne, Kingston & Co..... Mezzanine Floor 57
 Albert Champlon Co..... Basement 190
 Connecticut Tel. & Elec. Co..... Gallery 142
 Herz & Co..... Concert Hall 174
 Geo. Loring Co..... Third Tier Boxes 254
 A. R. Mosler Co..... Gallery 128
 National Sales Corp..... Basement 215
 C. F. Spltdorf..... Mezzanine Floor 49
 Uncas Specialty Co..... Gallery 105

PUMPS, TOOLS, JACKS, ETC.

Cooks Railway Appliance Co..... Mezzanine Floor 71
 Stevens & Co..... Mezzanine Floor 100
 Peter A. Frasse Co..... Second Tier Boxes 244
 Garvin Machine Co..... Basement 181b
 Duff Mfg. Co..... Basement 221
 Autmo Cabinet Co..... Basement 196a
 Oliver Mfg. Co..... Gallery 120
 Patterson, Gottfried & Hunter..... Basement 201
 Wray Pump & Register Co..... Concert Hall 171
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Autocoll Co..... Mezzanine Floor 58
 Byrne, Kingston & Co..... Mezzanine Floor 57
 Conn. Tel. & Elec. Co..... Gallery 132
 Duplex Ignition Co..... Gallery 126
 Heath Dry Gas Co..... Basement 230
 Holley Bros Co..... Mezzanine Floor 73
 Nat. Sales Corp..... Basement 215
 Pittsfield Spark Coil Co..... Mezzanine Floor 47
 C. F. Spltdorf..... Mezzanine Floor 49
 Wheeler, F. H..... Concert Hall 177

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Badger Brass Mfg. Co..... Mezzanine Floor 90
 R. E. Dietz Co..... Mezzanine Floor 52
 Edmunds & Jones Mfg. Co..... Gallery 140
 English & Mersick Co..... Gallery 122

Gray & Davis..... Mezzanine Floor 52
 C. T. Ham Mfg. Co..... Concert Hall 166
 Manhattan Lamp Works..... Second Tier Boxes 238
 National Novelty Co..... Third Tier Boxes 264
 Portable Electric Safety Light Co..... Third Tier Boxes 260
 Rose Mfg. Co..... Mezzanine Floor 92
 Rushmore Dynamo Works..... Gallery 124

MISCELLANEOUS EXHIBITS.

Acetyvone Co.—Carbide..... Gallery 148
 Albert Champlon Co..... Basement 190
 Harry A. Allers & Co.—Polish..... Second Tier Boxes 246
 American & British Mfg. Co..... Gallery 113
 Aurora Automatic Machine Co..... Concert Hall 172
 The Auto Supply Co..... Second Tier Boxes 238
 Avery Portable Light Co..... Gallery 118
 The A-Z Co..... Third Tier Boxes 265
 Baldwin Chain Mfg. Co..... Mezzanine Floor 60
 Bethlehem Steel Co..... Gallery 111
 Blue Ribbon Horse & Carriage Co..... Basement 181a
 Brennan Motor Mfg. Co..... Concert Hall 164
 Briscoe Mfg. Co..... Mezzanine Floor 67
 S. F. Bowser & Co..... Concert Hall 166
 Brooklyn Motor Supply Co..... Basement 225
 Bulck, Thomas D., Co..... Basement 186
 Byrne, Kingston & Co..... Mezzanine Floor 57
 Carpenter Steel Co..... Gallery 115
 Chandler Co.—Name plates..... Gallery 136
 Class Journal Co..... Basement 208
 C. Cowles & Co.—Elec. Specialties..... Second Tier Boxes 234
 Wm. Cramp & Sons, Ship & Engine Bldg. Co..... Gallery 112
 Detroit Lubricator Co..... Concert Hall 169
 Detroit Motor Car Supply Co..... Concert Hall 156
 Diamond Chain & Mfg. Co..... Concert Hall 167
 Wm. J. Duane & Co..... Concert Hall 160
 Michael Ehret..... Basement 182a
 Engeline Refining Co.—Engeline..... Third Tier Boxes 261
 Gabriel Horn Mfg. Co..... Concert Hall 173
 General Elec. Co.—Mercury Arc Rectifiers..... Basement 181
 Gray, Hawley Mfg. Co..... Gallery 139
 Hill Mfg. Co..... Basement 204
 E. F. Hodgson—Wigwam Garages..... Basement 194
 E. P. Ingersoll..... Basement 227
 Phineas Jones & Co..... Mezzanine Floor 76
 E. T. Kimball Co..... Third Tier Boxes 249
 Julius King Optical Co.—Goggles..... Basement 228
 Light Mfg. & Foundry Co..... Gallery 127
 Manhattan Auto Top Co..... Basement 209
 Manhattan Storage Co..... Basement 188
 Manufacturers' Foundry Co..... Mezzanine Floor 54
 Metal Stamping Co..... Basement 205
 Midgley Mfg. Co..... Mezzanine Floor 95
 Charles E. Miller..... Mezzanine Floor 101
 Morrison, McIntosh & Co..... Third Tier Boxes 251
 Motor..... Basement 196
 Motor Car Equipment Co..... Basement 192
 Mutual Auto Accessories Co..... Basement 220
 National Oil Pump & Tank Co..... Basement 224
 National Sales Corporation..... Basement 215
 Noera Mfg. Co..... Gallery 146
 N. Y. Sporting Goods Co..... Basement 202
 Pantasote Leather Co..... Concert Hall 181
 Post & Lester Co..... Mezzanine Floor 96
 Thos. Prosser & Son..... Gallery 121
 J. M. Quinby & Co..... Basement 182
 Rands Mfg. Co..... Concert Hall 159
 P. Reilly & Son—Leather..... Basement 186a
 M. E. Schoening..... Basement 206
 Schwarz Wheel Co..... Gallery 114
 C. A. Shaler & Co.—Elec. Vulcanizers..... Second Tier Boxes 237
 Shelby Steel Tube Co..... Mezzanine Floor 78
 Sibley & Pitman..... Basement 197
 Stall & Dean Mfg. Co.—Sporting Goods..... Third Tier Boxes 259
 Standard Metal Work Co..... Third Tier Boxes 263
 Standard Welding Co..... Mezzanine Floor 87
 Stevens & Co..... Mezzanine Floor 100
 Spicer Univ. Joint Mfg. Co..... Gallery 135
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 Springfield Metal Body Co..... Gallery 119
 Syracuse & Elbridge Glove & Mitten Co..... Second Tier Boxes 237
 Trades Adv. Pub. Co..... Basement 222
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 Valentine & Co.—Varnishes..... Gallery 107
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 Way Muffler Co..... Gallery 153
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GEORGE POPE.



M. I. BROCK.



C. R. MABLEY.



M. L. DOWNS

HOW THE AUTO SHOW IDEA DEVELOPED

By ARTHUR N. JERVIS.

AN argument in favor of January as the time for shows has been advanced recently by no less an important and authoritative person than Col. George Pope, chairman of the show committee of the Association of Licensed Automobile Manufacturers. In his remarks Col. Pope said:

"In years gone by, when the old guard makers were new in the field, and were looking for dealers to handle their product, the national show was largely a trade event, to which the manufacturers went seeking to do business with retailers. Now the old established manufacturers all have their regular line of dealers and the orders from these are booked in the fall. They do not go to the show to engage dealers to handle their output, because they are already supplied in this respect. They go to display their new models to the public, and the show, from being a purely trade event, has become a sort of festival for society and the automobiling class.

"Under these circumstances there is absolutely no call by the well-known manufacturers of the licensed cars for a show before January. They are not firms that started in business last month, or last year, and who have to hunt up dealers to sell their cars. The dealers in licensed cars, like the makers of them, are all established."

This calls attention to a fact of which there can be no question—the character of the Garden show has changed radically within a few years. No longer is it looked upon by the big manufacturers as an annual market for the booking of contracts with agents. This feature of the show has been waning during the last three years, and now the business done at shows between retail dealers and manufacturers is of secondary importance. This change in the function of the show is the more interesting because it is, in a way, a reversion. The first show, like that of this year, was addressed to the public rather than to the trade.

The First American Show in 1900.

A review of the shows brings out the story of the changes and will be interesting at this time. If the exhibition of a few "horseless carriages" at the last bicycle show at Madison Square Garden in January, 1900, be passed over, the first real automobile show was held in the Garden November 3-10, 1900.

Although the credit of the idea has been given to the Automobile Club of America, it really originated with James P. Young, secretary and treasurer of the Madison Square Garden Company. Mr. Young sought the cooperation of the Automobile Club of America, and the first show was announced as being under the auspices of the club.

A good photograph of that show would cause a hearty laugh now, although it was held only a little more than six years ago. There were not enough exhibits to fill the space, even with a board track on the main floor, although motorcycles and motor

tricycles were included with the automobile. The machines themselves were "near automobiles," of the shaftless huggy type, nearly all of them having steam or electricity for motive power. In the café were the nearest approaches to real motor cars. These were loan exhibits of imported cars, owned by members of the club, and they seemed quite wonderful at the time. The track was used for gymkhana events, braking, starting, and stopping tests, and other stunts. The mental attitude of the visitors was similar to that of investigators in an inventor's workshop who call to see if his device is really practical. The presence of the track and the whole arrangement suggested that it was a demonstration to answer the public's skeptical query of: "Will they go?" Very often they would not go. However, the first show was a success financially. During the following week an attempt was made to establish the Grand Central Palace as the home of future shows by inaugurating an exhibition there and announcing it as a continuance of the Garden show. This affair gathered in a few exhibitors who were not ready in time for the other event, but it was only a moderate success, and no attempt has since been made to have a show in that building until the present year.

The complete list of exhibitors at the first show is an interesting one, to glance over at this time, in view of the changes that have occurred. This is the list:

- | | |
|------------------------------------|-------------------------------------|
| Electric Vehicle Co. | Upton Machine Co. |
| Riker Vehicle Co. | Automobile Club of America. |
| Locomotive Co. of America. | Edmond Motorcycle Co. |
| National Automobile & Electric Co. | New York Motor Vehicle Co. |
| De Dion-Bouton Motorette Co. | Munger Vehicle Tire Co. |
| Waitham Manufacturing Co. | Steam Vehicle Co. |
| American Bicycle Co. | Badger Brass Manufacturing Co. |
| Winton Motor Carriage Co. | Bevin Bros. Manufacturing Co. |
| Mobile Co. of America. | E. A. Brecher & Co. |
| Baker Motor Vehicle Co. | Consolidated Rubber Tire Co. |
| Autocar Co. | Crest Manufacturing Co. |
| Foster Automobile Mfg. Co. | Diamond Rubber Co. |
| Automobile Co. of America. | Dixon Crucible Co. |
| Woods Motor Vehicle Co. | Downing & Co. |
| Stanley Manufacturing Co. | Dow Portable Electric Assistant Co. |
| Canda Manufacturing Co. | Geason Peters Air Pump Co. |
| Buffalo Electric Carriage Co. | B. F. Goodrich & Co. |
| Daimler Manufacturing Co. | Goodyear Tire and Rubber Co. |
| Holyoke Automobile Co. | Gray & Davis. |
| Knox Automobile Co. | Hartford Rubber Works Co. |
| Overman Automobile Co. | Janney, Steinmetz & Co. |
| International Motor Carriage Co. | Metallic Rubber Tire Co. |
| Trinity Cycle Manufacturing Co. | Charles E. Miller. |
| John T. Robinson & Co. | New Process Raw Hide Co. |
| Peerless Manufacturing Co. | New York Belting & Packing Co. |
| Springfield Cornice Works. | Pennsylvania Automobile & Gear Co. |
| St. Louis Motor Carriage Co. | C. F. Splittdorf. |
| Haynes-Apperson Co. | Veeder Manufacturing Co. |
| Strong & Rogers. | Ware Bros. |
| Duryea Motor Co. | |

There were no foreign exhibitors in the first show. The Garden was crowded at every session and the show was a success financially, as all succeeding shows have been. The cost of putting the first show on was \$11,000, outside the decorations, which were paid for by the exhibitors.

At this time the manufacturers were few in number and their total output was small. They had little need to look for dealers to handle their output, and it safely may be said that their chief object in participating in a show was that of edifying with the exploitation of new improvements and reviewing enthusiasm in those who were already automobilists, of arousing interest on the part of the public, and of selling cars direct to the users.

Ninety-three in the Second Show.

The second national show was held in Madison Square Garden, December 2-9, 1901. Ninety-three exhibitors took space in this. The track was omitted this time, but again there was a loan exhibit of foreign cars in the café. There was a Mors car shown by Foxhall P. Keene, half a dozen Panhard and Levassor machines, a Darracq, a Napier, a Renault and a Daimler-Cannstatt Mercedes. No foreign exhibitors had space.

The industry had then begun to develop rapidly. There was an increasing output by the factories, so that the makers found it more necessary to act as wholesalers only. The distance between the user and the manufacturer increased and the retailer began to flourish. Thus, during 1902, the show came to be regarded as a wholesale mart of manufacturers seeking to close with dealers. During this year the commercial future of American built cars became more certain. The National Association of Automobile Manufacturers was formed, and after a few conferences it was arranged that the next show should be at the beginning of the year instead of at the close, and that it should be managed by a committee on which the N. A. A. M., the Automobile Club of America and the Garden Company should each be represented, and that each of these organizations should share in the profits. Thus there was no show in 1902, and the third one was held a year and five weeks after the second one, or during January 17-24, 1903. At this show the number of exhibitors totaled 150, and for the first time a foreign firm was an exhibitor; this was the Paris Automobile Co., represented by Henry Fournier.

The Succeeding Shows.

At the third show the horseless buggy type began to disappear in favor of the European type of car, and after this the change of types was rapid, each succeeding year seeing fewer buggies and runabouts, fewer steamers and more gasoline cars. The single-cylinder motor and the horizontally disposed engine also were crowded aside, although not abrogated, any more than were steam and electricity.

The fourth national automobile show was held at Madison Square Garden, January 16-23, 1904. More than 200 exhibitors took space, including several foreign manufacturers. This show was held under the same auspices as the previous one. At the fourth show the vertical engine, located under the hood in front, was dominant, and the full-fledged touring car was revealing itself as the popular type, rather than the runabout with the detachable tonneau. Portents were fulfilled in 1905, and the tendency toward larger and higher powered cars became well established.

Then Came the Fifth Show.

By the time for the fifth show, which was held in Madison Square Garden January 14-21, 1905, the automobile industry had grown to such proportions that hundreds of would-be participants were unable to secure space, although 250 exhibitors were accommodated in the big building. At the shows of 1904 and 1905, the number of exhibitors was so great that the Garden was sadly crowded, and, each exhibitor being allowed to decorate his space to suit himself, the ensemble presented a motley scene of hodge podge in draperies and lighting effects. At all these

shows there was to some extent a sort of "first come, first served" policy—after the big makers were provided for—and the result was that the public was gulled to a certain degree, because every year there were upstart concerns, with experimental models, who promised great things, some booking orders, and who afterward sank into oblivion. It was seen by all that a weeding out and a discriminative exclusion would be wise, but the way to do it was what puzzled, until the problem was solved by the positive action of the veteran makers linked together in the Association of Licensed Automobile Manufacturers.

With the 1905 show, the contract between the National Association of Automobile Manufacturers, the Automobile Club of America and the Madison Square Garden Company expired, and the Association of Licensed Automobile Manufacturers obtained a three years' lease of the Garden, for the purpose of holding future shows under the auspices of the licensed makers, who were organized in March, 1903.

Now the Licensed Body Has the Garden.

Since 1905 the Garden show has been held under the auspices of the A. L. A. M., and the highly successful show there, January 13-20, 1906, was in charge of the same show committee that has the arrangements for the present one in hand, namely: George Pope, Marcus I. Brock and C. R. Mabley, with M. L. Downs secretary.

Under the new management there was a revolution in the matter of decorations, and so great a revolution was it that no affair which finds shelter in the Garden, neither horse show, ball, nor military pageant, has the gorgeousness of the annual automobile show. The lighting and decorating was put in charge of a committee, uniformity secured by not permitting any exhibitor to do a bit of decorating, and the artistic work given to a professional. Last January the old Garden presented a scene of grandeur that made regular patrons of it gape and gasp. The color scheme was white and gold, and the whole was laid out to represent an Italian garden in the summer time.

At the present seventh national show, January 12-19, the glory of the last is to be totally eclipsed. A fortune was spent in transforming the Garden into a scene of dazzling brilliancy. The general scheme is that of the Garden of a Swiss palace in early winter. The somber tones of the Garden are completely lost in the blazing glories of autumn foliage on rustic bowers, of sunset hues upon snowy peaks, and tawny fields beneath amber skies. The illusion is carried out to the uttermost and made perfect by heroic paintings at the ends and sides, which yield the spectators a grand perspective of Alpine scenery. Fountains and statues of allegorical design enhance the picture and help to furnish a setting for the jewels of the automobile industry.

Diplomats Who Will Attend the Opening Saturday Night.

From Washington will come on Saturday in a special train representatives of the embassies of Italy, Austria-Hungary, France, Great Britain, Germany, Brazil, Russia and Mexico. They will be met at the ferry with automobiles, and it is expected will reach Madison Square Garden not later than 8:30 P. M. The culminating feature of the lights arrangement will not be demonstrated until the arrival of the distinguished foreigners, the list of which is as follows:

Italy—Baron Edmondo Mayor des Planches, the Italian Ambassador and the dean of the diplomatic corps, accompanied by Count Neni-Mocenigo; Austria-Hungary—Ambassador Ladilaus Hegelmulle von Hengervar; France—M. des Portes de la Fosse, counsellor, and Lieut. de Blanpre, naval attache; Germany—Herr and Fraulein Hebbinghaus; Great Britain—E. V. Sturdy; Brazil—S. Gurgel do Amaral, first secretary; Russia—M. de Thal, secretary; Mexico—S. Balbino Valalos, charge d'affaires, his daughter, Senor Ricoy, and Mr. and Mrs. Landa Berriozabel.

After attending the opening of the show, the ambassadorial party will be the guests of the reception committee at dinner. They will remain in New York City over night.

MECHANICAL PROGRESS THAT WILL BE TOLD

By VICTOR LOUGHEED.

AT the show in Madison Square Garden there will be in evidence a mechanical progress commensurate with its splendid setting, which likewise will bespeak an advance not heretofore achieved by the industry. As never before, it is evident in the product of the thirty members of the Licensed Association that the American manufacturer has thrown down the gauntlet to his foreign competitor—and, in most cases, predecessor. The preeminence of the foreign engineer in the past has been a fact denied rather than disapproved, but now the proof is crowding close on the heels of the statement, and it is made clear in no uncertain way that the cars for the Garden show are fully capable of price, style, finish, reliability, quality, or any other kind of competition with their imported competitors.

Not the most critical mind can find any serious fault with the 1907 productions of the foremost American firms, and it is especially clear beyond all question that the biggest automobile bargains for the money are invariably American made, whatever may be thought of the less commercialized phase of the situation that achieves its successes regardless of price.

As has been increasingly apparent at each of the last few shows, the tendency towards acceptance of certain highly standardized and specialized forms is more emphasized than ever, and there is not a single manufacturer who does not present four-cylinder vertical motors in front, usually with sliding change-speed gears and drive by double chain or propeller shaft to the rear axle. Besides this most important construction there are, however, a number of motors of other type shown in the less expensive models, there being several two-cylinder horizontally-opposed motors, one horizontal single cylinder, and one vertical single cylinder. The horizontal-opposed motors are shown in both of their usual applications—longitudinally under the body and crosswise in front.

The six-cylinder engine, without having begun to sweep the field, as it is claimed to have done abroad, nevertheless is much in evidence. There is no question about the superior flexibility and torque range of the six-cylinder motor, but against this is the greater length and complication. Nothing but time can tell whether the advocates of the six-cylinder construction are destined to win general acceptance for the type they so strenuously uphold. A point that seems to give particular difficulty in the designing of these six-cylinder motors is the arranging of the intake piping, which every manufacturer arranges in a way that is peculiarly his own, showing that this detail is far from being reduced to final form and that the difficulty of feeding the cylinders uniformly is appreciated. One manufacturer goes the six-cylinderites two better, so to speak, and is placing on view an eight-cylinder motor, with the cylinders arranged in two diverging rows, constituting a typical example of the well-known V-shaped construction.

Air cooling is applied to the cars of at least four concerns, and, though it has failed to find more extensive acceptance, its continued use by these concerns—all of the highest standing and prominence—is assurance enough that it is a thorough success. Of particular interest to the novice and expert alike are the minor but not less important, refinements through which greater reliability and operating satisfaction is insured.

Water cooling departs little from practice previously established, the changes being

mostly in the direction of more liberal waterjacket spaces, larger piping, etc. The rotary gear pump seems to be displacing the centrifugal pump to some extent, while the inclosed gear drive for pumps has become all but universal.

The two-cycle engine has lost ground to the extent that one well-known maker who exhibited a car propelled by this type of motor last year has this year given it up. Against this reflection upon the merits of the two-cycle principle there is the greater success than ever before of the single manufacturer who still sticks to it, and the three and four-cylinder vertical-in-front two-cycle motors put out by this concern run with a smoothness and satisfaction not exceeded by the product of the best of their competitors.

Clutches will show a very considerable tendency in the direction of the multiple-disc, though by the use of cork inserts the cone and expanding clutches are perhaps in a fair way to hold their own. Easier working clutch springs, with smoother and more certain engagement, will be the most obvious results of these improvements.

Change-speed gears show a considerable gain for the gate-quadrant and selective-lever method of operation, which has the advantage over the progressive system of permitting the passing from any speed to any other without going through the intermediates. Four speeds ahead are the rule of all the larger and heavier cars, and in the cases where three speeds are retained, because of extreme motor simplicity or for other reasons the progressive method of operation is strongest. The simple manipulation of the individual clutch and planetary gears appeal to a number of manufacturers who evidently believe that foolproofness is a good quality for a car to possess. The most noteworthy of the planetary gears is that fitted to a large touring car of well-known make, with three forward speeds and the reverse. This gear has been used without radical change for two seasons and seems to give excellent satisfaction. The rest of the planetary gears are of the two-speed-forward-and-reverse type and are found only on the smaller cars. One example of a friction transmission is shown, applied to the smallest and lowest-priced car on the American market, which is made in a variety of styles, suitable for various classes of commercial and pleasure uses.

The propeller-shaft drive predominates to some considerable extent over its rival, the double chain, but the latter scores a point in that its use is most prominent on the cars of presumed highest quality, so the situation in respect to this phase of automobile evolution seems to strike a very even balance.

The I-beam axle section is manifestly increasing its vogue, for front axles especially, but also for rear axles where the propeller-shaft drive is in use. Here again it is evident that the dissenters from this construction feel that they have good reasons for not adopting it, in that they challenge any interested party to produce evidence reflecting upon the quality of their tubular, rectangular and other sections.

The annular ball bearing—chiefly of the Hess-Bright pattern, though neither the Mallicet & Blin nor the Standard are inconspicuous—has swept the field for certain classes of use, but in other places the conical roller bearing of the Timken people and the roller bearing of the Hyatt people seem as strongly entrenched as ever.



GODDESS OF THE SHOW.

Ignition systems are better than heretofore, and a great attention to details is apparent, but otherwise there are few changes from the constructions of previous years. The make-and-break system shows gains, but is still behind its competitor, the jump-spark.

Carbureters seem to be in a more unsettled state than any equally important element of automobile mechanism, if the variety of improvements be taken as a criterion. There are several cases in which the elaborate compensating mechanisms have been given up, but in others there is more elaboration than ever. In a couple of cases, at least, the stock fitment consists practically of two carbureters, one supplying the mixture at the lower speeds and the other coming into action only at high speeds. Despite the diversity devices all of them seem to give excellent satisfaction in use, which is, after all, the most important thing, and which simply goes to show that there are more ways than one of securing a desired end.

Especially significant, though from its very nature anything but especially noticeable, is the widespread acceptance of foreign practice in respect to the use of alloy steels for the parts on which devolve the heaviest and severest duties. It is now recognized that the merit of these high-grade materials is a question of fact rather than of opinion, and if one grade of steel will stand twice the stresses and cost little more than another, it requires only the commonest kind of good mechanical common sense to dictate its use for the vital details of an automobile.

Body designs exhibit considerable improvement, the most impressive feature of the season's development in this regard being the number of high-power runabouts, striking both in

appearance and in traveling qualities, since most of them constitute little less than genuine racing cars. A somewhat singular feature of this development is the failure of a single inclosed-body construction to appear on any of these runabouts, such as seemed indicated in the inside-driven broughams and coupés in favor a year or so ago. Both the limousine and the landaulet types are numerous, though the latter seems to be assailing the prestige of the former in some degree, apparently because of the advantage it presents in being capable of folding up, to make it suitable for both good and bad weather. The one-time popular canopy top is practically out of the running, its place having been thoroughly usurped by the folding Cape Hood. The glass front, formerly easily disposed of out of the way by folding against the canopy top, has not worked out so simply in connection with the Cape Hood, but the problem now seems solved by the expedient of folding the glass front down over the bonnet.

Accessories are numerous. It is enough to say here that a ramble through the accessory exhibits would interest the average enthusiast for as many weeks as the number of days that the show will be open. Lamps, speed indicators, odometers, ignition specialties, lubricating devices, shock absorbers, bearings, and a multitude of the other details that are essential to the fully-equipped car, all show progress.

Tires, like the materials of car construction, present few changes in outward appearance, but are confidently asserted to have gained materially in quality. Several examples of the newest tire idea—the removable rim, providing for the replacement of complete, inflated units, ready to be placed on the wheel in the briefest possible time, will be on view.

VANDERBILT CUP WINNER FOR THE FLORIDA MEET

LOUIS WAGNER, winner of the 1906 Vanderbilt Cup race, will be the star of the Ormond-Daytona meet, January 21-26. It had been expected that Demogeot, last year's winner of the speed crown, again would carry the Darracq colors in the Florida tournament, and in consequence there was considerable surprise when Wagner arrived Monday last on *La Bretagne*. A. Lee Guinness, the English owner of the 200-horsepower car which Demogeot drove two miles in 58 4-5, at the last moment was unable to sail. Therefore Wagner, driving the Vanderbilt Cup winner, will be the solitary Darracq professional in Florida, though Samuel B. Stevens, president of the New York Motor Club, expects to participate in the amateur events with the 1905 Darracq cup winner. A fast Oldsmobile flyer, with H. N. Harding at the wheel, is expected. R. W. Harroun, of Chicago, with the lightest racer ever constructed, is going to try in the high speed division. It weighs less than 500 pounds, and those

who visited the Aero Club department of the A. C. A. show will remember having seen the Harroun creation.

Five Stanley steamers will participate, Fred Marriott, of course, to figure as the pilot of the fastest one of the quintet. H. Ernest Rogers, the Brookline amateur, and F. L. Fyles, of Providence, are other steam entrants, the latter's car to be driven professionally by L. F. N. Baldwin.

The stock car entrants already include two Waynes, an American Mercedes, a Stoddard-Dayton and a Welch. The motorcycle contingent will include Curtis and Indian cycles, both concerns having something out of the ordinary for the Florida contests. Jefferson De Mont Thompson, chairman of the A. A. A. Racing Board, will be the honorary referee, and Samuel A. Miles, general manager of the N. A. A. M., will be the acting referee. It is expected that those in attendance at the Garden show will leave for Florida on the Seaboard noon trains of Saturday and Sunday.

BRITISH AERONAUTS FOR ST. LOUIS RACE.

A cable received from London announces that the Aero Club of Great Britain has decided to send a team to St. Louis to compete for the Gordon Bennett Cup. Professor A. K. Huntington, of King's College, London; Hon. C. S. Rolls, at present in America; Griffith Brewer, and J. T. C. Moore-Brabazon, all of whom figured in the first contest from Paris last year, will constitute the 1907 British team. With a full entry from Great Britain and France, competitors from Spain, Belgium and Germany, and a possibility of Italian participation, a great international race is assured. An encouraging report has been received from Washington on the club's efforts to have foreign balloons entered in the race admitted free of duty, and a definite decision is expected in a few days on the question.

AMERICAN ENTRANTS FOR BALLOON RACE.

Alan R. Hawley and William A. Hawley, of the Aero Club of America, will purchase the largest balloon allowed by the rules for the Gordon Bennett contest, and have decided to spend the early part of the summer at Paris receiving instruction in aeronautics. The Aero Club of St. Louis and another Aero Club of America will also have maximum size balloons, so that America is assured of having entrants who will not be handicapped by reason of not having balloons of the largest possible capacity.

At Cincinnati an aero club is being organized, and a request has been made to the Aero Club of America for the loan of one of the club's balloons to make trial ascensions from that city, where the quality of gas has been found to be very good.

THE LICENSED ASSOCIATION AND ITS WORK

By HARRY T. CLINTON, PUBLICITY DEPARTMENT.

THE work of the Association of Licensed Automobile Manufacturers is the most interesting factor in the great industrial field. The history of the Association is brief. In 1903 the Electric Vehicle Company secured from George B. Selden patent rights to his invention, on which he had received a patent in 1895 from the United States Patent Office. Concurrent with this transfer was formed an association known as the Manufacturers' Mutual Protective Association, with ten members, agreeing to act concertedly as regards the patent. They had recognized the validity of this patent and were anxious to pay such tribute to the inventor as he deserved. These ten, with the Electric Vehicle Company, were the charter members of the licensed association. The object of the Association, aside from protecting its members in their patent rights, was the development in the industry.

It was not the aim of the Association, as some have endeavored to point out, to cramp the industry in any form, but, on the other hand, it has tried through the co-operative methods of its members to further the industry and conserve the interest of the public, to promote confidence in trade by carefully discriminating against the manufacturer of an unmerited product, to prevent the sale and importation of cars that were not only a detriment to the industry, but to the dealer and user alike, and to forestall the flooding of the market with a cheaply constructed car to be forced on the often non-discriminating buying public. At the time of the organization one of the officers expressed himself as follows, which thoroughly demonstrates the position taken and the attempt to conserve the interest of the public as well as the legitimate manufacturer and dealer:

"It is not the intention to make the Association a 'close corporation.' On the contrary, its money will be expended and the efforts of its officers put forth to further the best interests of the automobile business and prevent abuses. It will be our object to improve the standard of the American automobile and to see that purchasers get full value for their money by putting a check upon any 'wildcat' or get-rich-quick promotions. There is noticeable even now a tendency on the part of irresponsible persons to copy devices which established makers have spent thousands of dollars to perfect, and to assemble in the end a trashy article that sells on looks and will not give satisfaction. There is a tendency on the part of men having small machine shops to put up flimsy engines and carriage bodies and dispose of them, which they are now enabled to do because of the demand for automobiles exceeding the supply. This sort of business the Association can and will stop. It will not try to shut out reputable and established manufacturers, who build a reliable vehicle; it will license all such, but it will license no unreliable upstarts. In this way the Association will protect the public and be a boon to all purchasers of gasoline automobiles."

To carry out the proposed ideas of the Association, its first step was the establishment of several departments or branches, the first inaugurated being the Mechanical branch. The organization of the Mechanical branch may be considered not only the most important step taken by the Licensed Association, but the action stands pre-eminent in the whole automobile industry. The two things accomplished by the branch which are especially significant to the user are the increased quality in construction and the standardization of parts.

Mechanical Branch.

The branch numbers nearly 100 engineers and factory superintendents, all of whom have had years of experience in the manufacture of gas engines for road locomotives. The members meet once or twice a month for the discussion of the best means of automobile construction and development. Without doubt, the

open and frank talks on specific mechanical subjects at these meetings are productive of results that otherwise could not be obtained. At first these meetings were somewhat constrained, but it soon developed that the other fellow had some ideas that were worth knowing.

There is no branch of any manufacturing industry that requires quite so much experimentation and as many tests as that of the automobile. Recognizing the fact that owing to the expensive experiments and tests necessary and that the lack of time often prohibited the individual manufacturer from making the many researches, a mechanical branch was established at Hartford, under the direction of an expert metallurgist. The laboratory is equipped with the latest testing machines, and extensive experiments and tests on engines, metals, oils, tires, and, in fact, in all parts not thoroughly developed in automobile construction, are continually going on. The association recognized that a car constructed of material scientifically correct was necessary if the confidence of the public was to be gained. Standards for various metals to be used in specific parts, which after repeated experiments were found to be correct, were adopted. Specifications for metals were compiled and the use of these specifications resulted in a stronger and more elastic steel being made. The co-operation of the American steel manufacturers was sought and received, the steel makers being ready to furnish a better grade of material if it could be made of uniform specifications and in quantities which would permit of better grades. Heretofore the grade of steel used by foreign manufacturers was considered superior to the American make, but it may be unreservedly said that, through the specifications adopted by the Association, from a point of material used now, the American product equals, and in some cases is a higher grade than, that now used by many foreign manufacturers.



GRACEFUL MOORISH TOWER
THAT SURMOUNTS SHOW.

The other elements of standardization can be termed a boon to the user. The adoption of the A. L. A. M. screw standard is recognized as one of the most important steps taken in the automobile industry to avoid the annoying trifles that often cause so much trouble to the user. Every driver of a machine knows what it means to be stranded by the stripping of a nut or bolt and the additional aggravation by finding when he reaches a repair shop that the desired article is useless on account of the varied pitch of the thread or the size of head of a nut. Uniformity, not only in screws and bolts, but in spark plugs, will facilitate the work of any automobile owner.

Many subjects have been discussed by the branch which have a decided bearing on the future methods of automobile construction. Subjects under discussion are carburetion, engine vibration, oils, shock absorbers, detachable and interchangeable tires and rims, piston rings, ball bearings, elimination of noise and the use of alcohol as a fuel. The subject of alcohol is at present receiving the immediate attention of the test committee and some interesting reports are expected at the January meeting, scheduled for Tuesday and Wednesday of show week.

Traffic Department.

Another department of particular interest, not only to the manufacturers but to the users, is the Traffic branch. It is generally known that the transportation of automobiles has become one of the chief sources of revenue to the railroads to-day. The department has been instrumental through its manager in obtaining better rates on nearly all classes of automobile traffic.

It suggests and assists in the routing, not only of the product of its members, in such a way that better rates are obtained, but it facilitates the handling of the product, insuring in many cases a safer and quicker delivery. Reduced rates on parts and many reclassifications of benefit both to the manufacturer and railroads is the result of the untiring efforts of the department. The adoption by the railroads of suitable box cars with large side doors is a feature that must not be overlooked. Heretofore the side door of the ordinary box car was too small to admit of an entirely assembled machine, and it was found necessary to take the automobile apart for transportation, and in many cases to the detriment of the machine, as it could not be put together at its destination with the same skill as that at the factory, with the natural result that the user, as well as the dealer, did not get the full benefit of the factories' experts.

Agency Department.

The Agency department of the association is an important factor in the selling end of the industry. By terms of the license agreement, manufacturers are not allowed to market their product through any dealer handling unlicensed cars and thereby aiding or abetting the manufacture or sale of cars manufactured by infringers of the Selden patent. Through the work of this department violations which necessarily would be a detriment to the industry as a whole have been avoided and the manufacturer and user alike benefit by the guarantee of the quality of the dealer. The department has been instrumental in arbitrating many small controversies of its members and helping to secure reliable men for all branches of the industry. Records of cars manufactured, sold and used, not only by the association members but by other manufacturers, are kept, which will prove a most important document upon the decision of the pending suits.

The work of the association has been progressing rapidly, endeavoring in every way to direct and guide the industry along a sound and conservative path and, through the merits of the cars produced under its standards, point out to the nondiscerning buyer the cars that have come to stay. Aside from retaining the public's confidence in the industry by the manufacture of a meritorious product, it has relentlessly endeavored to protect the buyer from being "bitten" by what some one has very rightly called the "fly by night" importers and mushroom manufacturers. Like every new industry, as soon as a certain amount of popularity has been attained, every Tom, Dick and Harry thinks he is qualified to be a manufacturer, not taking into consideration the lack of experience and, in many cases, the lack of substantial backing. A few experimental cars are made, exhibited and finally unloaded on the unsuspecting buyer, who afterwards, as a rule, will do all the experimenting on the car, in an unsuccessful endeavor to make it do the work required of it; and so with the importer who, with a model to take orders, often unloads a cheaply constructed car and returns home, leaving the purchaser to alleviate his thoughts by condemning the industry as a whole.

Some interesting statistics prepared by the association show to some extent what might be the result if action was deemed unnecessary. In the past five years it is shown that 367 corporations and individuals have incorporated or organized for the purpose of the manufacture or importa-



A SWISS GUARD.

In this spick and span manner the Garden attendants will be faultlessly dressed.

tion of automobiles who have been notified of their infringement of the Selden patent. Of these 367 it is found that there remain in the business, actually making, exhibiting or advertising, only 111, showing the number who have ceased to be 218; the balance constituting importers, largely partnerships and individuals, doing small business, totals 38. Of these importers the total number ceased are 15, leaving 23 still in business. When it is considered that the leading American makers constitute the licensed group, all of whom have been in the business for years, and that the 32 members produce 81 per cent. of the output while 60 manufacturers of unlicensed cars produce 11 per cent., what will become of the 73 manufacturers producing only 8 per cent.?

In the meantime it must not be forgotten that the basic Selden patent is behind the Association of Licensed Automobile Manufacturers, and while part of the association was aiming for a "car perfectum," the prosecution of the suits against the infringers of the patent has not abated. As said in a recent issue of a motor paper, the attitude of the association and its attorneys has not been to

try the case in the newspapers, but through the proper channels provided by the United States patent laws. However, a régime of the court proceedings of this already famous case may be of interest, especially at this time, owing to the proximity of a final decision in the proceedings. In 1879 Selden filed specifications and applied for a patent on what the patent office considered the pioneer invention of a gas engine for road or horseless carriage use. In 1895 the patent was granted the inventor. In the Commissioner of Patents' annual report in the *Patent Office Gazette* for May 12, 1896, the attitude of the patent office is clearly defined: "Selden in 1895 received a patent, November 5, No. 549,160, which may be considered the pioneer invention in the application of the compression gas engine for road or horseless carriage use." At the time many of the manufacturers of gasoline automobiles recognized not only the validity of the patent, but elected to acknowledge the genius of the pioneer of the courageous prosecution of a new art.

In 1900 suit was brought against the Buffalo Gasoline Motor Company for infringement of the patent, resulting in Judge Hazen's decree in sustaining the patent and holding that the defendants had infringed. The same year the Winton Motor Carriage Company was prosecuted for infringement; Judge Coxe overruled the demurrer of the defendants with an opinion most favorable to the patent. Suit was brought against the Automobile Ford Carriage Company and the Raulitz Automobile Company, the former in 1900 and the latter in 1901, resulting in the complainants being granted perpetual injunctions and accountings. In 1903 suit was filed against the Ford Motor Company, as manufacturer, John Wanamaker and C. A. Duer as dealers, and O. J. Gude as user, for infringement. These are the so-called

test cases upon which a decision is being awaited with some intrepidation by those whose beliefs have not led them to recognize a monopoly granted by the United States Patent Office. That a decree is expected soon is generally understood, for the last witness of the complainants is nearing the end of cross-examination, after which, with suitable time for the preparation of briefs and arguments, the case will be presented for trial in the United States Courts having jurisdiction over same.



FATHER NEPTUNE'S KINDLY FACE ADORNS THE FOUNTAIN'S BASE.

TREND OF DESIGN THAT WILL BE REVEALED

By C. B. HAYWARD.

JUST what the automobile of 1907 is to be like, is something that will serve to attract thousands of people to Madison Square Garden during the coming week. Even at this late day there is the usual crop of ante-show prophecies, those hardy annuals about automobiles being vastly cheaper, and the arrival of the "poor man's" car, that make their appearance as faithfully at this time as does the picture of the interior of a German toy factory just before Christmas. In view of the present widespread state of education concerning things automobile that prevails, it is hardly probable that many people are still deceived by talk of this kind, which for the most part has been dropped by all except the most poorly informed disseminators of alleged news. Suffice it to say that all who go to the show looking for the cheap car, or the automobile that sells for next to nothing, and which can be maintained for nothing at all, are bound to be disappointed to a greater extent than ever before, for prices, instead of declining, have risen. It is not merely that American makers are turning out bigger cars; they are manufacturing better cars, better not alone in design, but better by far where material is concerned, and materials of the quality now employed are costly. For that reason the cars of 1907 will come higher than their predecessors in many instances, but they will in turn represent a higher value for the money than has been offered the purchaser in the past.

Very Few Radical Departures to Be Shown.

Where novelties are concerned, probably the most radical thing to be staged will be the gasoline-electric chassis of the Electric Vehicle Company. It represents one of the many expedients adopted as a stepping stone toward the "gearless" car, which is the aim of so many designers, and though it is an old story abroad, numerous experiments having been made in this direction and a car actually placed on the market during the past year, this is the first car of its type to see the light on this side of the Atlantic. Its appearance is not merely tentative; its builders are showing it, not as a curiosity to attract attention, but to take orders for duplicates of it, for it has only been uncovered to the public after eighteen months of constant experimenting and trials under actual service conditions in order that any defect of design or construction in the slightest detail would be certain to manifest itself. Not until this was established beyond a doubt did its builders decide to place it on the market, so that the chassis which will be placed on view represents the successful culmination of their labors.

Another vehicle that is bound to attract considerable attention of a favorable nature is the "waterless" fire engine. It is not, technically speaking, a fire engine, but more in the nature of an auxiliary fire wagon which has been used by the Springfield, Mass., fire department during the past half year with telling effect. Strictly speaking, it is not a commercial vehicle in any sense of the word, though on the other hand it can hardly be termed a pleasure car. It is a 40-horsepower Knox "waterless" touring chassis, upon which a body specially adapted to the purpose has been mounted, and its speed and lightness, combined with a generous carrying capacity, have proved its most valuable attributes. Its appearance at the show has far more significance than that of being merely an exhibit that is somewhat out of the ordinary and hence a drawing card for the curious; it presages the dawn of an era when all fire apparatus will be motor propelled and as such represents a type that will have many followers in years to come.

Where both motor and vehicle design generally are concerned it will be necessary, as has come to be usual during the past two or three shows, to look for those refinements of detail to which improvements and alterations are now largely confined. That is, with the exception of one or two instances of revolutionary

changes in motor design such as that of the Pope-Toledo 50-horsepower car, which represents a totally new departure from standards hitherto adhered to by the makers of the latter. Conforming to what is considered as an advanced form of construction, the valves are placed in the head, in this case at an angle, and though the opposite disposition has been retained, but a single camshaft and set of cams is employed, the valves being operated by means of walking-beams actuated by pushed rods which are moved in turn by cams cut with a profile that raises the rod in order to actuate one valve and permits it to drop under the tension of a spring to operate the other. Though slow in gaining recognition, the influence of this form of valve placing has been gaining ground.

The principle of offsetting the cylinders from the center of the crankcase, though as old as the automobile motor itself, as it was a feature of one of Daimler's first V type motors, is something that has again come in for consideration. It has been adopted in the case of the Thomas 40-horsepower car, which will make its debut at the Garden show, though it is already quite well known where the public is concerned, having been on the road to the extent of quite a number of cars during the past few months. The amount of offsetting in this case is one inch; in the Northern, 3-4 inch. The new Winton 40-horsepower car, which is the heaviest car ever turned out by this house, also embodies the same principle.

Multiple Disk Clutch Has Gained Ground.

Another trend that has developed strength to a very considerable extent during the year intervening since the last show is the adoption of the multiple disk clutch. This will be found on a larger number of cars than ever before, and the slow but steady growth it has had would seem to be indicative of lasting popularity with both the designer and the owner of cars thus equipped. The selective type of change speed gear has likewise found more favor than previously and now outnumbers the straight or progressive sliding type, while the same is true of the propeller shaft drive as compared with the side chain type, the use of the former becoming more and more general and on cars of higher powers than has hitherto been the case, refinements of design and improved construction having made it possible to overcome most of the defects primarily urged against this form of drive. On the other hand, the advocates of the side chain drive have awakened to what appears to be its chief, if not only, drawback, that of constant wear and noise due to its exposure to the flying mud and grit of the road, and have accordingly undertaken to encase the side chains, an example of this being found in the Lozier.

The controversy over the relative merits of the four and six-cylindered types of motors, which is still smoldering, has served to keep interest in this question at a high point, though the lack of new adherents during the past year would seem to favor the upholders of the four, as the Pierce Great Arrow, which made its first appearance in the Glidden Tour, is the only addition. This, together with the Stevens-Duryea in two models and the Franklin air-cooled six-cylinder car, will constitute the showing of this type. The *pièce de résistance* in this field will be the Hewitt eight-cylindered car, rated at 60 horsepower, which marks the extreme development that multiplication of the cylinders has attained on this side of the Atlantic. Its presence at the Hewitt stand will be more striking owing to the fact that the only other type exhibited by the same maker will be a car of the single cylinder type equipped with a touring body. Brakes have also come in for considerable attention, though here, as in other things, improvement is to be looked for in detail.

This tabular presentation of the show will be studied with great interest, for it tells much and quickly.

PRINCIPAL DETAILS OF AMERICAN CARS AT MADISON SQUARE GARDEN

JANUARY 12-19, 1907.

COSTING LESS THAN \$1,000

CAR	Price	Power	No. Cyl-inders	Seats	Clutch	Change Speed Gear	Drive	Wheel-base	Weight	Tires
Orient, Model BR.....	\$400	4	1	2	Friction.....	Friction, 5...	Double chain	80"	750	26 x 2½
Model ER.....	475	4	1	2	Friction.....	Friction, 5...	Double chain	73"	650	26 x 2½
Model ET.....	525	4	1	4	Friction.....	Friction, 5...	Double chain.	77"	750	26 x 2½
Oldsmobile.....	650	7	1	2 or 4	Disc.....	Planetary, 2..	Single chain.	66"	.....	28 x 3
Cadillac, Runabout..	800	10	1	2	Disc.....	Planetary, 2..	Single chain.	.....	.....	30 x 3
Touring.....	950	10	1	4	Disc.....	Planetary, 2..	Single chain.	76"	.....	30 x 3½
Hewitt.....	1,000	10	1	4	Disc.....	Planetary, 2..	Single chain.	72"	.....	30 x 3½

COSTING FROM \$1,150 TO \$1,500

Buick, Runabout.....	\$1,150	22	2	2	Cone.....	Planetary, 2..	Chain.....	89"	1,750	30 x 3½
Touring Car....	1,250	22	2	5	Cone.....	Planetary, 2..	Chain.....	89"	1,850	30 x 3½
Waltham Orient, Run- about.....	1,250	16	4	2	Cone.....	Sliding, 3....	Shaft.....	82"	1,300	30 x 3½
Autocar, Runabout...	1,200	14	2	3	Flywheel Disc	Sliding, 3....	Shaft.....	81"	1,500	30 x 3

COSTING FROM \$1,500 TO \$1,900

Northern, Touring Car	\$1,700	20	2	5	Exp. Ring....	Planetary, 2..	Shaft.....	106"	2,100	32 x 3½
Waltham-Orient, Touring Car.....	1,750	20	4	.....	.....	.....	.....	.....	.....	.....
Franklin, Runabout..	1,800	12	4	2	Disc.....	Sliding, 3....	Shaft.....	90"	1,250	30 x 3—30 x 3½
Touring Car.	1,850	12	4	4	Disc.....	Sliding, 3....	Shaft.....	90"	1,450	30 x 3—30 x 3½
Elmore, Runabout or Touring Car.....	1,750	24	3	2-5	Exp. Ring....	Selective, 3...	Shaft.....	102"	1,750	32 x 3½
Pope Tribune.....	1,750	16-20	4	2	Invert'd Cone	Sliding, 3....	Shaft.....	95"	1,600	32 x 3½

COSTING FROM \$2,000 TO \$2,500

Buick— Runab't, Mod. "K".	\$2,000	25-30	2	5	Disc.....	Planetary, 2..	Shaft.....	106½"	1,800	32 x 4
Touring, Mod. "A".	2,000	25-30	4	5	Disc.....	Planetary, 2..	Shaft.....	102½"	2,000	32 x 4
Runab't, Mod. "S".	2,200	25-30	2	5	Disc.....	Sliding, 3....	Shaft.....	106½"	1,800	32 x 4
Touring, Mod. "D".	2,200	25-30	4	5	Disc.....	Sliding, 3....	Shaft.....	102½"	2,000	32 x 4
Cadillac—Touring Car or Runabout.....	2,000	20	4	5	Cone.....	Selective, 3...	Shaft.....	100"	.....	32 x 3½
Waltham-Orient— Touring Car.....	2,100	20	4	5	Cone.....	Sliding, 3....	Shaft.....	96"	1,850	32 x 3½

COSTING FROM \$2,500 TO \$3,000

Corbin.....	\$2,500	24	4	5	Cone.....	Selective, 3...	Shaft.....	108"	2,200	34 x 3½—34 x 4
Cadillac.....	2,500	30	4	5	Disc.....	Planetary, 3..	Shaft.....	102"	.....	32 x 4
Stevens-Duryea.....	2,500	20	4	5	Disc.....	Sliding, 3....	Shaft.....	90	1,850	30 x 3½
Elmore.....	4,500	35	4	5-7	Exp. Ring....	Selective, 3...	Shaft.....	109"	2,200	34 x 4
Winton.....	2,500	30	4	5	Individual...	Ind. Clutch..	Shaft.....	104"	.....	34 x 4
Haynes.....	2,500	30	4	5	Constricting Band.....	Selective, 3...	Shaft.....	102"	2,250	32 x 4
Knox.....	2,500	25-30	4	5	Cone.....	Selective, 3...	Shaft.....	102"	2,250	32 x 4
Thomas—Runabout and Touring Car....	2,750	40	4	3 or 5	Cone.....	Selective, 3...	Shaft.....	112"	2,500	32 x 4
Oldsmobile—Runab't or Touring Car.....	2,750	35-40	4	3 or 5	Cone.....	Selective, 3...	Shaft.....	106½"	2,500	34 x 3½—34 x 4
Franklin.....	2,800	20	4	5	Disc.....	Sliding, 3....	Shaft.....	105"	1,900	34 x 3—34 x 3½
Locomobile.....	2,800	20	4	5	Cone.....	Sliding, 3....	Double chain	96"	.....	32 x 4
Autocar.....	3,000	30	4	5	Flywheel Disc	Sliding, 3....	Shaft.....	112"	2,500	32 x 4
Columbia.....	3,000	24-28	4	5	Cone.....	Sliding, 3....	Shaft.....	109"	2,350	32 x 3½—32 x 4
Pope-Hartford.....	2,750	25-30	4	5	Invert'd Cone	Sliding, 3....	Shaft.....	102"	2,400	32 x 4

PRINCIPAL DETAILS OF AMERICAN CARS AT MADISON SQUARE GARDEN

JANUARY 12-19, 1907.

COSTING FROM \$3,500 TO \$4,500

Car	Price	Power	No Cyl's	Seats	Clutch	Change Speed Gear	Drive	Wheel-base	Weight	Tires
Haynes.....	\$3,500	50	4	7	Cons'g Band.	Selective....	Shaft.....	110"	2,950	.....
Winton.....	3,500	40	4	7	Disc.....	Selective, 4...	Shaft.....	112"	.....	34 x 4½
Northern.....	3,500	50	4	7	Comp. Air...	Sliding, 3...	Shaft.....	119"	3,300	34 x 4½
Thomas—Runabout or Touring Car.....	4,000	60	4	7	Disc.....	Selective, 4...	Double chain	118"	3,200	36 x 4 — 36 x 5
Peerless.....	4,000	30	4	5	Internal Ex-pand. Band	Selective....	Shaft.....	109"	2,800	34 x 4 — 34 x 4½
Franklin.....	4,000	30	6	7	Disc.....	Sliding, 3...	Shaft.....	127"	2,400	36 x 3½ — 36 x 4
Royal Tourist.....	4,000	45	4	7	Cone.....	Sliding.....	Shaft.....	114"	.....	34 x 4½
Knox.....	4,000	35-40	4	7	Cone.....	Selective....	Double chain	112"	2,800	34 x 4½
Pierce—Great Arrow... Packard—Runabout and Touring Car....	4,000	30	4	5	.....	Sliding.....	Shaft.....	112"	2,900	34 x 4 — 34 x 4½
Matheson—Runabout.....	4,250	35	4	3	Disc.....	Selective....	Double chain	117"	3,200	36 x 4 — 36 x 4½
Touring Car.....	4,500	.....	.....	7	.....	.....	.....	.....	3,400	.....
Thomas—Demi-Limousine....	4,500	60	4	7	Disc.....	Selective, 4...	Double chain	118"	3,500	36 x 4 — 36 x 5
Columbia.....	4,500	40-45	4	7	Cone.....	Selective, 4...	Double chain	117"	3,400	36 x 4 — 36 x 4½
Stevens-Duryea.....	3,500	35	6	5	Disc.....	Sliding.....	Shaft.....	114"	2,300	34 x 4
Stearns—Touring.....	4,500	30-60*	4	5	Int'l Exp'g...	Selective, 4...	Double chain	120"	3,200	36 x 4 — 36 x 4½
Pullman.....	4,750	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pope-Toledo.....	4,250	50	4	7	Disc.....	Selective, 4...	Double chain	115"	2,900	36 x 3½ — 36 x 4½
Apperson.....	4,750	50-55	4	7	Comp. Band.	Selective, 4...	Double chain	116"	3,000	36 x 4 — 36 x 4½
Studebaker.....	4,000	30	4	.....	Cone.....	Sliding, 3...	Shaft.....	104"	.....	34 x 4
Apperson.....	4,200	40-45	4	.....	Comp. Band.	Selective, 4...	Double chain	116"	2,900	34 x 4 — 34 x 4½

COSTING FROM \$5,000 TO \$6,500

Matheson—Runabout	\$5,000	50	4	3	Disc.....	Selective....	Double chain.	123"	3,250	36 x 4 — 36 x 5
Thomas—Limousine..	5,000	60	4	7	Disc.....	Selective, 4...	Double chain.	118"	3,800	36 x 4 — 36 x 5
Pierce—Great Arrow...	5,000	45	4	7	.....	Sliding.....	Shaft.....	124"	3,400	36 x 4 — 36 x 5
Royal Tourist—Lim..	5,000	45	4	7	Cone.....	Sliding.....	Shaft.....	114"	.....	34 x 4½
Knox—Limousine....	5,000	35-40	4	6	Cone.....	Selective....	Double chain	112"	3,200	34 x 4½
Apperson—Runabout	5,000	50	4	3	Comp'n Band	Selective, 4...	Double chain	100"	1,800	34 x 3½ — 34 x 4
Lozier—Runabout and Touring Car.....	5,000	40	4	{ 2 } 7	Disc.....	Selective, 4...	Double chain	{ 115" 117"	{ 2,675 3,050	.....
Thomas—Landaulet..	5,200	60	4	7	Disc.....	Selective, 4...	Double chain	118"	3,800	36 x 4 — 36 x 5
Matheson—Touring Car.....	5,500	50	4	7	Disc.....	Selective....	Double chain	123"	3,400	36 x 4 — 36 x 5
Simplex*.....	5,600	30-35	4	5-7	Rev. Cone...	Sliding, 4...	D'ble chain	{ 106" 111" 114"	{ 2,300	{ 910 x 90 920 x 120mm.
Simplex—Runabout..	5,760	50	4	2	Cone.....	Selective, 4...	Double chain	124"	2,250	{ 915 x 105 935 x 135
Lozier—Limousine....	6,000	40	4	7	Disc.....	Selective, 4...	Double chain	117"	3,680	36 x 4 — 36 x 4½
Stevens-Duryea.....	6,000	50	6	7	Disc.....	Sliding, 3...	Shaft.....	122"	3,500	36 x 4 — 36 x 5
Pierce—Great Arrow...	6,500	65	6	7	Cone.....	Sliding.....	Shaft.....	135"	3,900	36 x 4½ — 36 x 5
Matheson—Landaulet and Limousine.....	6,500	50	4	7	Disc.....	Selective....	Double chain	123"	3,450	36 x 4 — 36 x 5
Packard—Limousine..	5,500	30	4	7	Int'l Exp'd'g.	Sliding, 3...	Shaft.....	122"	3,300	34 x 4 — 34 x 4½
Peerless.....	5,000	45	4	7	Int'l Exp'd'g.	Selective, 4...	Shaft.....	114"	3,300	34 x 4 — 34 x 4½
Walter.....	.....	40	4	7	Disc or Cone	D'ble Slid.	Shaft.....	124"	3,200	36 x 4 — 36 x 5
Walter.....	5,500	50	4	7	Disc or Cone.	D'ble Slid. 4.	Shaft.....	124"	3,600	36 x 4 — 36 x 5
Hewitt.....	5,500	50-60	8	7	Disc.....	Planetary 2..	Shaft.....	112"	.....	85 x 105

*NOTE.—In order to avoid confusion by unnecessarily encumbering the table, the progressive or straight sliding type of change speed gear is merely designated as "sliding," and the selective type as "selective" only, the following numeral in each case representing the number of forward speeds, it being understood that there is always a reverse. For the same reason a multiple disc type of clutch, being designated as "disc," though on light runabouts with planetary change speed gear a single disc is usually employed. Where two sets of figures are given under tires, the smaller are those of the front wheels and the larger those of the rear. Where a runabout and touring car of the same make are listed together, the specifications given apply to both, except where separate figures are given, in which case the upper applies to the runabout.

*Simplex. Price of 30-35 horsepower touring varies according to cost of body, that given being the minimum. Chassis alone sells at \$4,950. Wheel-bases given are optional.

*Stearns. 30-60 horsepower. This is explained by the fact that a special system of carburetion has been made a feature of the motor. It consists of a small and a large carburetor fed from a common float chamber. On the small one the motor develops 30 horsepower, the large not coming into service until the small one is fully open. Control is by the usual throttle lever.

DETAILS OF IMPORTED CARS SHOWN AT MADISON SQUARE GARDEN

CAR	Price	Power	No. Cyls.	Seats	Clutch	Change Speed Gear	Drive	Wheel-base	Weight	Tires
Darracq.....	\$6,500	20-32	4	7	Cone.....	Special Slid- ing, 3.....	Shaft.....	120"	2,800	880 x 120 mm.
Renault (Chassis).....	5,500	30	4	7	Reverse Cone	Sliding, 4..	W Shaft.....	118"	2,300	{ 875 x 105 880 x 120 mm
Isotta Fraschini— Runabout.....	7,250	35	4	7	Disc.....	Selective, 4..	Double chain	120"	1,870	{ 910 x 90 mm. 920 x 120 mm
Panhard (Chassis).....	7,800	} 35	4	7	Disc.....	Sliding, 4..	Double chain	124"		920 x 120
Runabout.....	8,050									
Rochet Schneider.....		16-20	4		Cone.....	Sliding, 3..	Shaft.....	111"		815 x 105
Rochet Schneider.....		16-20	4		Int'l Exp'd'g.	Sliding, 4..	Double chain	118"		920 x 120
Rochet Schneider.....	7,000	40-50	4		Int'l Exp'd'g.	Sliding, 4..	Double chain	122"		{ 920 x 120 935 x 135
Renault.....		14-20	4		Reverse Cone	Sliding.....	Shaft.....	107½"		875 x 105
Renault.....		10-14	4		Reverse Cone	Sliding.....	Shaft.....	98½"		800 x 95
Renault.....	5,750	35-45	4		Reverse Cone	Sliding, 4..	Shaft.....	118"		{ 875 x 105 880 x 120
Hotchkiss—Runabout	9,250	50	6	3	Cone.....	Selective, 4..	Shaft.....	132"	2,650	{ 875 x 105 880 x 120
Fiat.....	7,500	35	4	5	Disc.....	Selective, 4..	Double chain	136"		{ 910 x 90 920 x 120
Isotta Fraschini— Runabout.....	10,250	50-65	4	3	Disc.....	Selective, 4..	Double chain.	132"		{ 910 x 90 920 x 120
Hotchkiss.....	6,750	35	4		Cone.....	Selective, 4..	Shaft.....	118"	} 2,350 (Chas's)	875 x 105
Panhard.....	15	4	4		Cone.....	Sliding, 4..	Double chain	111"		880 x 120
Panhard.....	24	4	4	4	Disc.....	Sliding, 4..	Double chain			
Panhard.....	8,050	50	4	7	Disc.....	Sliding, 4..	Double chain	134"		920 x 120
Darracq—Touring.....	8,000	40-60	4	7	Cone.....	Selective, 3..	Shaft.....	125"	3,000	935 x 135
Clement-Bayard.....	10,750	60	4	7	Disc.....	Selective, 4..	Double chain	130"		36 x 4½—36 x 5½
English Daimler.....	6,500	30	4	6	Cone.....	Selective, 4..	Double chain	114"	2,850	920 x 120
English Daimler.....	7,500	35	4	6	Cone.....	Selective, 4..	Double chain	114"	2,850	880 x 120
English Daimler.....	8,500	45	4	7	Cone.....	Selective, 4..	Double chain	114"	2,850	895 x 135
De Dietrich.....	10,500	40	4	7	Metallic.....	Selective, 4..	Double chain	128"		{ 820 x 100 925 x 120
C. G. V.....	6,500	35	4	7	Cone.....	Sliding, 4..	Double chain	120"		920 x 120
C. G. V.....		14-20	4	4	Cone.....	Sliding.....	Shaft.....	110"		815 x 105
Clement-Bayard.....		24-32	4	4	Disc.....	Selective.....	Shaft.....	118"		880 x 120
C. G. V.....		20-24	4	4 or 7	Cone.....	Selective.....	Double chain	112½"		880 x 120
Clement-Bayard.....		30-40	4	5	Disc.....	Selective.....				880 x 120
C. G. V.....		75	4	5 or 7	Cone.....	Selective.....	Double chain	118"		880 x 120
De Dietrich.....		60	4	5	Metallic.....	Selective.....	Double chain	130"		935 x 135
Rochet Schneider.....		70	4		Metallic.....	Selective.....	Double chain	129"		920 x 120
Hotchkiss.....		20-30	4		Cone.....	Selective.....	Shaft.....	118"	} 2,250 (Chas's)	875 x 105
										880 x 120

AMERICAN ELECTRIC VEHICLES SHOWN AT MADISON SQUARE GARDEN

CAR	Price	H.P.	Wheelbase	Weight	Tires	Battery	Mileage
Cantono—Fore-Brougham Ex- tension, Straight Front.....	\$3,500	5	90"	3,000	2½" Solid.....		
Babcock—Stanhope.....	1,650	2½	63"	1,900	Solid.....	40 Cells.....	50
Babcock—Roadster.....	1,400	2½	78"	1,500	32 x 3½" Pneumatic.....	24 Cells.....	100
Babcock—Victoria.....	1,600	2½	78"	1,550	32 x 3" Pncumatic.....	24 Cells.....	75-100
Cantono—Fore-Landaulet.....	3,500	5	96"	3,000		44 Cells.....	40
Columbus—Stanhope.....	1,600		68"	1,600	30 x 3½" Pneumatic.....	24 Cells.....	40-75
Columbus—Coupe.....	1,900		60"	1,600	30 x 3½" Pneumatic.....	24 Cells.....	40-75
Columbus—Surrey.....	2,500		80"	2,200	34 x 4" Pneumatic.....	24 Cells.....	60
Columbus—Surrey.....	3,000		80"	2,400	34 x 4½" Pneumatic.....	24 Cells.....	50
Pope-Waverley—Vict.-Phae-ton.	1,600		68"		30 x 3½" Pneumatic.....	30 Cells.....	
Pope-Waverley—Stanhope.....	1,400		70"		30 x 3½" Pneumatic.....	30 Cells.....	
Pope-Waverley—Spec. Stanhope	2,000		76"		32 x 3½" Pneumatic.....	30 Cells.....	
Pope-Waverley—Station Wagon	2,250		77½"		30 x 4" Pneumatic.....	41 Cells.....	
Baker—Runabout.....	1,800	2	76"	1,500	30 x 3" Pneumatic.....	24 Cells.....	80
Baker—Brougham or Landaulet.	4,000	6	98"	4,000	34 x 4—34 x 4½"	40 Cells.....	40-60
Baker—Victoria.....	3,000	2	90"	2,200	36 x 4—36 x 4½"	24 Cells.....	40
Baker—Stanhope.....	1,600	1	68"	1,050	30 x 3"	12 Cells.....	40
E. V. Co.—Victoria-Phaeton...	1,500				Pneumatic.....	24 Cells.....	
E. V. Co.—Victoria.....	4,000				Pneumatic.....	44 Cells.....	
E. V. Co.—Brougham.....	4,000				Pneumatic.....	44 Cells.....	
E. V. Co.—Landaulet.....	4,000				Pneumatic.....	44 Cells.....	
E. V. Co.—Hansom.....	4,000				Pneumatic.....	44 Cells.....	
Studebaker—Runabout.....	1,135		67"	1,650	30 x 3" Pneumatic.....	24 Cells.....	
Studebaker—Stanhope.....	1,275		67"	1,565	Pneumatic.....	24 Cells.....	
Studebaker—Victoria-Phaeton..	1,775		68"	2,000	Pneumatic.....	28 Cells.....	
Studebaker—Coupe.....	2,225		68"	2,200	Pneumatic.....		
Studebaker—Special Stanhope..	1,675		74"	2,250	Pneumatic.....	36 Cells.....	
Studebaker—Surrey.....	2,085					28 Cells.....	

SPECIFICATIONS AND DETAILS OF MOTORS OF AMERICAN CARS AT GARDEN SHOW

JANUARY 12-19, 1907.

CAR	H. P.	No. Cyl.	Drive	Normal Speed	Cast	Bearings	Valve Placing	Cam-shafts	Valve Operation	Gover- nor	Cooling	Radiator	Pump	Lubrication	Ignition
Orient.....	4	1	3 1/2 x 4 1/2	1,800	Sep. Head...	Phos. Br'ze	One Side	...	Direct (au- to inlet)...	No.	Air...	...	...	Mechanical	H. T.
Oldsmobile.....	7	1	5 x 6	...	...	Babbitt...	One Side	...	Direct.....	No.	Water.	Tubular.	...	Gravity....	H. T.
Hewitt.....	10	1	4 1/2 x 6	...	...	Plain.....	...	...	...	No.	Water.	...	...	...	H. T.
Cadillac.....	10	1	5 x 5	...	Ind. Jacket	Babbitt & Bronze..	...	...	Eccentric..	No.	Water.	Fin. Tubular	Centrifugal	Mechanical	H. T.
Autocar.....	14-16	2	4 x 4	1,000	Opposed....	Bronze....	One Side	1	Inlet-rock- er Arm, Ex. Dir...	No.	Water.	Fin. Tubular	Special.....	Mechan. 3...	H. T.
Waltham Orient.....	16	4	3 1/2 x 4 1/2	1,000	Independent	Alum. Alloy	One Side	1	Direct.....	No.	Air....	...	...	Exh. Pres. 1	H. T.
Buick.....	22	2	4 1/2 x 5	...	Opposed....	Plain.....	Head....	1	Direct.....	No.	Water.	Tubular....	Gear.....	Mechanical	H. T.
Franklin.....	12	4	3 1/2 x 3 1/2	...	Independent	Plain.....	Opposite	1	R'ker Arms	Yes.	Air....	...	...	Mechanical	H. T.
Waltham Orient.....	20	4	4 x 4 1/2	900	Independent	Alum. Alloy	One Side	1	Direct.....	No.	Air....	...	...	Exh. Pres. 1	H. T.
Northern.....	20	2	5 1/2 x 5 1/2	...	Opposed....	Nickel Bab	One Side	1	Direct.....	No.	Water.	Tubular....	Rot. Eccen.	Mechan. 1...	H. T.
Cadillac.....	20	4	4 x 4 1/2	...	Ind. Jackets	Babbitt & Bronze..	One Side	1	Direct.....	Yes.	Water.	Tubular....	Helical....	Mechanical	H. T.
Franklin.....	20	4	4 x 4	...	Independent	Plain.....	Opposite	1	R'ker Arms	Yes.	Air....	...	...	Mechan. 4...	H. T.
Stevens-Duryea.....	20	4	3 1/2 x 4 1/2	800	Independent	Plain.....	One Side	1	Direct.....	No.	Water.	Cellular....	Centrifugal	Mechanical	H. T.
Locomobile.....	20	4	3 1/2 x 4 1/2	1,000	Pairs.....	Babbitt & St'l Alloy.	Opposite	2	Direct.....	Yes.	Water.	Cellular....	Centrifugal	Mechan. 3...	L. T., Spec. Mag.
Corbin.....	24	4	4 1/2 x 4 1/2	1,200	Independent	Parson's Wh. Bress	Head....	1	R'ker Arms	No.	Air....	...	...	Mechan. 7...	H. T.
Elmore.....	24	3	4 1/2 x 4	800	Independent	Babbitt & Bronze..	Two Cycle	...	Two Cycle..	No.	Water.	Cellular....	Gear.....	Mechan. 5...	H. T.
Columbia.....	24-28	4	4 x 4 1/2	900	Pairs.....	Babbitt & Bronze..	One Side	1	Direct.....	Yes.	Water.	Cellular....	Centrifugal	Circ'l'tg Sys.	L. T.
Knox.....	25-30	4	4 1/2 x 4 1/2	1,200	Independent	Babbitt & Bronze..	Head....	1	R'ker Arms	No.	Air....	...	...	Mechanical	H. T.
Autocar.....	30	4	4 1/2 x 4 1/2	1,000	Independent	Bronze....	One Side	1	Inlet-r'ker Arm Exh. Dir.....	No.	Water.	Tubular....	Special.....	Mechanical	H. T.
Cadillac.....	30	4	4 1/2 x 5	...	Independent	Babbitt and Bronze..	One Side	1	Direct.....	Yes.	Water.	Honeycomb.	Gear.....	Mechanical	H. T.
Winton.....	30	4	4 1/2 x 5	1,000	Pairs.....	Plain.....	One Side	1	Direct.....	Yes.	Water.	Tubular....	Centrifugal	Mechan. 8...	H. T.
Haynes.....	30	4	4 1/2 x 5	1,000	Pairs.....	Roller....	Opposite	2	Direct.....	No.	Water.	Honeycomb.	Rotary....	Mechan. 6...	H. T.
Packard.....	30	4	5 x 5 1/2	...	Pairs.....	Opposite	2	Direct.....	Yes.	Water.	Tubular....	...	...	Sin. Plunger P'mp Cir. System.	H. T. Eism & Ac.
Locomobile.....	35	4	4 1/2 x 5 1/2	1,000	Pairs.....	Babbitt & Alloy St'l	Opposite	2	Direct.....	Yes.	Water.	Cellular....	Centrifugal	Mechanical	L. T., Spec.
Elmore.....	35	4	4 1/2 x 4	800	Independent	Babbitt & Bronze..	Two Cycle	...	Two Cycle..	No.	Water.	Cellular....	Gear.....	Mechan. 6...	H. T.
Oldsmobile.....	35-40	4	4 1/2 x 4 1/2	750	Pairs.....	Parson's Wh. Brass	One Side	1	Direct.....	No.	Water.	Tubular....	Gear.....	Gear Pump, Circ. Sys.	H. T.
Knox.....	35-40	4	4 1/2 x 5 1/2	1,000	Independent	Babbitt & Bronze..	Head....	1	R'ker Arms	No.	Air....	...	...	Pressure....	H. T.
Thomas.....	40	4	4 1/2 x 5	800	Pairs.....	Comp. Al'y	One Side	1	Direct.....	No.	Water.	Tubular....	Centrifugal	Mechan. 6...	H. T.
Peerless.....	30	4	4 1/2 x 5 1/2	...	Pairs.....	Opposite	2	Direct.....	Yes.	Water.	Tubular....	...	...	Mechan. 6...	H. T.
Stearns.....	30-60	4	5 1/2 x 5 1/2	...	Pairs.....	D. W. F. B'll	One Side	1	Direct.....	No.	Water.	Tubular....	Rotary....	Mechanical	H. T. Mag. and Ac
Pope-Tribune.....	16-20	4	...	...	Pairs.....	Plain.....	One Side	1	Direct.....	No.	Water.	Planetic....	...	Mechanical	H. T.
Pope-Hartford.....	25-30	4	...	...	Pairs.....	Head....	1	R'ker Arms	No.	Water.	Planetic....	...	...	Mechanical	H. T.
Buick.....	25-30	4	4 1/2 x 4 1/2	...	...	One Side	1	Direct.....	No.	Water.	Tubular....	...	...	Mechanical	H. T.
Stevens-Duryea.....	35	6	3 1/2 x 4 1/2	1,000	...	Plain.....	One Side	1	Direct.....	No.	Water.	Cellular....	Centrifugal	Mechanical	H. T.
Winton.....	40	4	5 x 5	1,000	Pairs.....	Plain.....	One Side	1	Direct.....	No.	Water.	Tubular....	Centrifugal	Mechan. 8...	H. T.
Haynes.....	50	4	5 1/2 x 6	900	Independent	Roller....	Opposite	2	Direct.....	No.	Water.	Honeycomb.	Rotary....	Mechan. 6...	H. T. Mag. and Ac.
Pierce Great Arrow.....	45	4	5 x 5 1/2	900	Independent	...	Opposite	2	Direct.....	No.	Water.	Cellular....	Centrifugal	Spec. Pump Circ. Sys...	H. T. Bosch Mag. & Ac. L. T. Mag.
Matheson.....	50	4	5 1/2 x 6	600	Independent	Bronze....	Head....	1	R'ker Arms	No.	Water.	Honeycomb.	Centrifugal	Mechan. 10.	H. T.
Northern.....	50	4	5 x 5 1/2	...	One Piece.	Wh. Brass.	Head....	1	R'ker Arms	No.	Water.	Tubular....	Cams'ft G's	Floot-feed 2	H. T.
Matheson.....	35	4	4 x 6	600	Independent	Bronze....	Head....	1	R'ker Arms	No.	Water.	Honeycomb.	Centrifugal	Mechanical	L. T.
Peerless.....	45	4	5 1/2 x 5 1/2	...	Pairs.....	Opposite	2	Direct.....	Yes.	Water.	Tubular....	...	...	Mechanical	H. T.
Columbia.....	40-45	4	5 x 5	900	Pairs.....	Babbitt & Bronze..	One Side	1	Direct.....	Yes.	Water.	Cellular....	Gear.....	Mechan. 7...	H. T.
Matheson.....	50	4	5 1/2 x 6	600	Independent	Bronze....	Head....	1	R'ker Arms	No.	Water.	Honeycomb.	Centrifugal	Mechan. 10.	L. T.
Simplex.....	30-35	4	4 1/2 x 5 1/2	...	Pairs.....	Bronze and Babbitt	Opposite	2	Direct.....	Yes.	Water.	Honeycomb.	Centrifugal	Pressure....	H. T. Bosch Mag.
Simplex.....	50	4	5 1/2 x 5 1/2	...	Pairs.....	Bronze and Babbitt	Opposite	2	Direct.....	Yes.	Water.	Honeycomb.	Centrifugal	Mechanical	H. T. Bosch Mag.
Pierce Great Arrow.....	30	4	4 1/2 x 4 1/2	900	Independent	...	Opposite	2	Direct.....	No.	Water.	Cellular....	Centrifugal	Spec. Pump Circ. Sys.	H. T. Bosch Mag. & Ac. L. T. Mag.
Thomas.....	60	4	5 1/2 x 5 1/2	...	Independent	Spec. Alloy	Opposite	2	Direct.....	No.	Water.	Cellular....	Gear.....	Mechanical	H. T. Bosch Mag., Atw Kent G.
Franklin.....	30	6	4 x 4	...	Independent	...	Opposite	1	R'ker Arms	Yes.	Air....	...	...	Mechan. 6...	H. T.
Royal Tourist.....	45	4	5 1/2 x 5 1/2	...	Pairs.....	Spec. Alloy	Opposite	2	Direct.....	No.	Water.	Cellular....	Rotary....	Mechanical	H. T. Bosch Mag. & Ac.
Pierce Great Arrow.....	65	6	5 x 5 1/2	...	Independent	...	Opposite	2	Direct.....	No.	Water.	Cellular....	Centrifugal	Spec. Pump Circ. Sys.	H. T. Bosch Mag. & Ac.
Lozier.....	40	4	4 1/2 x 5 1/2	900	Pairs.....	Bronze....	Opposite	2	Direct.....	Yes.	Water.	Honeycomb.	Centrifugal	Pressure....	H. T.
Lozier.....	60	4	5 1/2 x 6	900	Pairs.....	Bronze....	Opposite	2	Direct.....	Yes.	Water.	Honeycomb.	Centrifugal	Pressure....	H. T.
Stevens-Duryea.....	50	6	4 1/2 x 5 1/2	1,000	Independent	...	One Side	1	Direct.....	No.	Water.	Cellular....	Centrifugal	Mechanical	H. T.
Studebaker.....	30-35	4	4 1/2 x 5 1/2	...	Pairs.....	...	...	1	Direct.....	No.	Water.	Cellular....	...	Mechanical	L. T. Mag.
Peerless.....	45	4	5 1/2 x 5 1/2	...	Pairs.....	Opposite	2	Direct.....	Yes.	Water.	Tubular....	...	...	Mechanical	H. T.
Apperson.....	50	4	5 1/2 x 5	...	Independent	...	Opposite	2	Direct.....	No.	Water.	Tubular....	Piston....	Mechanical	H. T. Mag. and Ac.
Walter.....	40	4	5 x 5 1/2	900	Pairs.....	...	Head and Side....	1	Direct.....	...	Water.	Honeycomb.	...	...	H. T. Mag and Ac.
Walter.....	50	4	5 1/2 x 6	900	Pairs.....	...	Head and Side....	1	Direct.....	...	Water.	Honeycomb.	...	...	H. T. Eism. Mag. & Ac.
Hewitt.....	50-60	8	...	900	Independent	Plain.....	One Side	1	Direct.....	No.	Water.	Cellular....	Centrifugal	Mechan. 14.	H. T. Bosch

SPECIFICATIONS AND DETAILS OF MOTORS OF FOREIGN CARS
MADISON SQUARE GARDEN.

CAR	H.P.	No. Cyl.	Motor Dimensions	Normal Speed	Cast	Bearings	Valve-placing	Camshaft's	Valve Operation	Governor	Radiator	Pump	Lubrication	Ignition
Renault.....	10-14	4	75 x 120		Pairs.	Plain.....	Op'site.....	2	Direct.....	No.	Special.....	Ther-Siphon	Pump Circ'n	H. T. Mag.
Renault.....	14-20	4	90 x 120		Pairs.	Plain.....	Op'site.....	2	Direct.....	No.	Special.....	Ther-Siphon	Pump Circ'n	H. T. Mag.
Panhard.....	15	4	90 x 130		Indp't	Plain.....	Op'site.....	2	Direct.....	No.	Honeycomb.	Pump.....	Mechanical.	H. T. Eisemann Mag.
C. G. V.....	14-20	4	95 x 102		1 Piece	Plain.....	Op'site.....	2	Direct.....	No.	Honeycomb.	Centrifugal.	Pressure.....	H. T. Eisemann Mag.
Panhard.....	24-30	4	110 x 140		Indp't	Plain.....	Op'site.....	2	Direct.....	No.	Honeycomb.	Centrifugal.	Mechanical.	H. T. Eisemann Mag.
Renault.....	20-30	4	100 x 140		Pairs.	Plain.....	One Side	1	Direct.....	No.	Special.....	Ther-Siphon.	Pump Circ'n	H. T. Mag.
Darracq.....	20-32	4	112 x 120		Pairs.	W'te Metal	One side	1	R'k'r Arms	No.	Gilled Tube.	Gear.....	Mechanical.	{ L. T. Bosch Mag. H. T. Accum.
Fiat.....	20	4			Pairs.	Plain.....	Op'site.....	2	Direct.....	No.	Honeycomb.	Centrifugal.	Automatic.	H. T. Bosch Mag.
Renault.....	34-45	4	100 x 140		Pairs.	Ball.....	One side.	1	Direct.....	No.	Honeycomb.	Centrifugal.	Automatic.	H. T. Bosch Mag.
Panhard.....	50	4	160 x 175		Indp't	Ball.....	Op'site.....	2	Direct.....	No.	Honeycomb.	Centrifugal.	Mechanical.	H. T. Eisemann Mag.
Fiat.....	60	6			Pairs.	Ball.....	Op'site.....	2	Direct.....	No.	Honeycomb.	Centrifugal.	Automatic.	H. T. Bosch Mag.
Isotta Fraschini.....	35	4												
Fiat.....	35	4	125 x 150		Pairs.		Op'site.....	2	Direct.....	No.	Honeycomb.	Centrifugal.	Automatic.	L. T. Mag.
Panhard.....	35	4	130 x 140		Indp't	Plain.....	Op'site.....	2	Direct.....	No.	Honeycomb.	Centrifugal.	Mechanical.	H. T. Eisemann Mag.
Hotchkiss.....	35	4	125 x 125	1,000	Pairs.	Ball.....	Op'site.....	2	Direct.....	No.	Honeycomb.	Centrifugal.	Mechanical.	H. T. Eisemann Mag.
Hotchkiss.....	50	6		1,000	Pairs.	Ball.....	Op'site.....	2	Direct.....	No.	Honeycomb.	Centrifugal.	Mechanical.	H. T. Eisemann Mag.
Isotta Fraschini.....	50-65	4	145 x 160		Pairs.	Ball.....	Op'site.....	2	Direct.....	No.	Honeycomb.	Centrifugal.	Pressure.....	H. T. Bosch Mag.
Darracq.....	40-60	4	130 x 130		Pairs.	W'te Metal	One side	1	R'k'r Arms	No.	Gilled Tube.	Gear.....	Mechanical.	{ L. T. Bosch Mag. H. T. Accum.
Rochet-Schneider.....	16-20	4	100 x 120	900	Pairs.	Ball.....	Op'site.....	2	Direct.....	No.	Tubular.....	Rotary.....	Gear Pump.	H. T. Mag.
Rochet-Schneider.....	30-35	4	120 x 160	800	Pairs.	Ball.....	Op'site.....	2	Direct.....	Yes	Tubular.....	Rotary.....	Gear Pumps.	L. T. Mag.
Rochet-Schneider.....	40-50	4	140 x 180	700	Pairs.	Ball.....	Op'site.....	2	Direct.....	Yes	Tubular.....	Rotary.....	Gear Pump.	L. T. Mag.
C. G. V.....	35	4	121 x 152		1 Piece	Ball.....	Op'site.....	2	Direct.....	No.	Honeycomb.	Centrifugal.	Pump Circ'n	H. T. Mag.
Clement-Bayard.....	60	4			Indp't	Ball.....	Op'site.....	2	Direct.....	Yes	Honeycomb.	Centrifugal.	Pressure.....	L. T. and H. T. Z.
C. G. V.....	75	4	140 x 150		1 Piece	Ball.....	Op'site.....	2	Direct.....	No.	Honeycomb.	Centrifugal.	Pump Circ'n	
Clement-Bayard.....	24-32	4	105 x 140		Indp't	Ball.....	Op'site.....	2	Direct.....	Yes	Honeycomb.	Centrifugal.	Pump Circ'n	H. T. Mag.
C. G. V.....	20-24	4	111 x 133		1 Piece	Ball.....	Op'site.....	2	Direct.....	No.	Tubular.....	Centrifugal.	Pump Circ'n	L. T. Mag. and Ac'm.
Clement-Bayard.....	30-40	4	95 x 130		Indp't	Ball.....	Op'site.....	2	Direct.....	Yes	Honeycomb.		Pressure.....	H. T. Mag.
De Dietrich.....	40	4	130 x 160		Pairs.	Ball.....	One side.	1	Direct.....	No.	Honeycomb.	Centrifugal.	Mechanical.	L. T. Mag.
De Dietrich.....	60	4	146 x 180		Pairs.	Ball.....	One side.	1	Direct.....	No.	Honeycomb.	Centrifugal.	Mechanical.	L. T. Mag.
Rochet-Schneider.....	70	4	160 x 160		Pairs.	Ball.....	Op'site.....	2	Direct.....	Yes	Tubular.....	Rotary.....	Gear Pump.	L. T. Mag.
Hotchkiss.....	20-30	4	115 x 120	1,000	Pairs.	Ball.....	Op'site.....	2	Direct.....	No.	Honeycomb.	Centrifugal.	Mechanical.	H. T. Eisemann Mag.
English Daimler.....	35	4	140 x 150		Pairs.		One side.	1	Direct.....	No.	Tubular.....		Gravity.....	H. T. Mag.
English Daimler.....	45	4	150 x 150		Pairs.		One side.	1	Direct.....	No.	Tubular.....		Gravity.....	H. T. Mag.
English Daimler.....	30	4	130 x 150		Pairs.		One side.	1	Direct.....	No.	Tubular.....		Gravity.....	H. T. Mag.

NOTE: Carbureters.—This head has been omitted altogether, principally from the fact that it would be impossible to set forth briefly the differences in the various types used by different makers, beside which the majority describe their carbureters as "automatic" or merely as "float feed" or again the "best," none of which convey any great amount of information.

Ignition.—Except where a magneto is mentioned, it is to be understood that the current is supplied by accumulators, one or two sets being employed, though on the lighter cars dry cells are employed as a reserve. Where the numeral 2 follows the statement of the ignition it indicates that two entirely independent systems are employed. "H. T." and "L. T." refer to high and low tension.

General.—Under the head of valve operation "direct" means with the usual push rods and tappets, and "rocker arms" by overhead arms or walking-beam. Under lubrication "mechanical" refers to a motor-operated type of force feed oiler, the numeral following giving the number of independent leads. The numeral following the type of change speed gear, such as "Selective 4," indicates the number of speeds forward. Under engine bearings "plain" is merely stated in distinction to ball bearings where the maker has not supplied more definite data, such as bronze, babbit, alloy, etc.

DETAILS OF AMERICAN GASOLINE COMMERCIAL VEHICLES
MADISON SQUARE GARDEN.

CAR	H.P.	No. Cylinders	Cooling	Transmission	Drive	Tires	Wheel-base	Type	Carrying Capacity	
Winton.....	40	4	Water...	Selective...	Shaft.....	{ 36 x 4" 36 x 7" Twin }	Solid..	13 ft.	Heavy Truck.	10,000 lbs.
Knox.....	40	4	Air.....	Selective...	Shaft.....				Aux. Fire Dep't Wagon..	Special Des'n.
Knox.....	40	4	Air.....	Selective...	Shaft.....				Truck.....	5,000 lbs.
Knox.....	40	4	Air.....	Selective...	Shaft.....				Truck.....	6,000 lbs.
Olds.....	16-18	2	Water...	Planetary..	Chain.....	34 x 4" Solid.....	96"		Light Truck or 'Bus.....	3,000 lbs.
Franklin.....	12	4	Air.....	Sliding....	Worm.....	30 x 3 1/2" Sold.....	90"		Light Truck..	2,000 lbs.
Cadillac.....	10	1	Water...	Planetary..	Chain.....	30 x 3" Pneumatic....	76"		Delivery.....	1,000 lbs.

DETAILS OF AMERICAN ELECTRIC COMMERCIAL VEHICLES
MADISON SQUARE GARDEN.

CAR	Motors	Cells in Battery	Drive	Tires	Type	Capacity
Pope-Waverley.....	1	42	Chain.....	32 x 3—36 x 3"	Delivery.....	1,000 lbs.
Pope-Waverley.....	1	40	Chain.....	30 x 3"	Light Truck.....	1,000 lbs.
Pope-Waverley.....	2	42	Chain.....	36 x 3—42 x 3"	Light Truck.....	2,000 lbs.
Pope-Waverley.....	2	42	Chain.....	36 x 6—42 x 6"	Heavy Truck.....	10,000 lbs.
McCrea Motor Truck Co.....	1	22	Chain.....	36 x 2 1/2"	Delivery.....	1,000 lbs.
General Vehicle Co.....	1	44	Chain.....	32 x 3"	Delivery.....	1,000 lbs.
General Vehicle Co.....	1	44	Chain.....	36 x 4"	Light Truck.....	2,000 lbs.
General Vehicle Co.....	2	44	Chain.....	36 x 6"	Heavy Truck.....	7,000 lbs.
General Vehicle Co.....	2	44	Chain.....	36 x 7—36 x 48"	Heavy Truck.....	10,000 lbs.
Studebaker.....	2	40	Chain.....		'Bus.....	14 pass.

PREDETERMINATION OF MAXIMUM MOTOR POWER*

BY R. ARNOUX, VICE-PRESIDENT TECHNICAL COMMITTEE, AUTOMOBILE CLUB OF FRANCE.

ACCURATE predetermination of the maximum power of an internal combustion motor of given dimensions is a subject of great interest for the organizers of great racing events, both for cars and motor boats, as well as for designers. For the engineer and the manufacturer this interest is represented by the knowledge he wishes to have of the maximum output, which, by means of the usual conventional modifications of design, he can hope to obtain from a motor of certain dimensions, or one having a cylinder of a given cubic capacity. For the organizers of racing events, the subject is of interest, in that it provides a means of equalizing the chances of the various competitors in the same event by giving a basis for a handicapping system.

As this power is at once the result of the pressure developed by the explosion of the volume of the cylinder in which the explosion takes place and the angular velocity of the moving parts, it would appear impossible, *a priori*, to establish any formula permitting the determination of this maximum power output with a degree of precision sufficient for practical purposes, where only the cylinder volume or one of its dimensions is known. But this apparent impossibility disappears when the philosophy of the internal combustion motor is examined more at length, as we shall do here. Internal combustion motors all possess a common characteristic, that of drawing from the surrounding atmosphere, of which the pressure, and in consequence the density, are constantly varying, the oxygen necessary for their operation. On the other hand, it is not the bulk of the air thus drawn in that produces combustion, and in consequence the complete utilization of the combustible gaseous mixture, but an invariable proportion between it and a given amount of fuel. This, in the case of ordinary petroleum spirit, or gasoline, is one part gasoline to 15 parts air by weight, that is, 12 cubic liters of air to one gram of gasoline, this proportion permitting of the disengagement of the maximum amount of heat obtainable by the most efficient utilization of this combustible.

This established, we may take up the subject of determining as accurately as possible the exact influence of the different factors that limit the maximum power output of the internal combustion motor. It is well known that the energy developed by a gaseous mass, in passing from the volume v to volume V , is equal to the integrated value of the product of the pressure p , by the corresponding elementary variation dv of the volume. That is to say:

$$\int_v^V p \, dv$$

In explosion motors, this quantity of energy, that is, indicated power, is valued by a diagram traced in rectangular coordinates, across which the abscissæ are proportional to the course of the piston, and the ordinates to the corresponding pressure. The spaces on this diagram are determined with the aid of a planimeter, and if these spaces are given by the instrument in square millimeters, for example, it will suffice to divide by the length of the maximum abscissa, measured in millimeters, to obtain the mean value of the Pm of the pressure. This mean pressure is that which must be constantly exerted on the head of the piston in order that it may develop the same amount of energy. Since v designates the volume at the end of compression, that is, the initial volume of the gaseous mixture; and V , the volume at the end of the stroke, there is as the value of the preceding integral between the limits v and V :

$$\int_v^V p \, dv = (V - v) P_m \quad (2)$$

Now the volume $(V-v)$ is none other than that generated by the piston during the total length of its travel, that is to say, the *cylindrical* volume, and it will be plain that the amount of

energy developed by each cylinder will be equivalent to the product of its volume by its mean pressure.

The Interesting Phenomenon of Expansion.

This last relation is interesting in that it tends to foster experiment resulting in the reduction to a minimum of the initial volume v of the explosive mixture and in consequence of the use of the highest degrees of compression possible short of causing spontaneous combustion, in order to extract from a given quantity of gas the maximum amount of energy available. A slight digression may be made here from the question of how to determine the maximum power that a motor of a given cylinder capacity is capable of developing, to recall what we said in 1903 at the Second International Automobile Congress, in our report on the subject of ignition, relative to the employment of high compression. The explanation of this growth of power with the compression, as illustrated in practice with gas engines, is very simple. It is, in fact, the phenomenon that permits us to *transform into work* all, or, more generally speaking, a part of the heat contained in an elastic fluid. This phenomenon is that of expansion. A gaseous fluid is a spring that may be tightened to advantage in heating it, and which cools upon expansion after having produced its energy. The fall in temperature, and in consequence the partial disappearance of the heat as the result of the expansion, represent the means employed by nature to pay for the work created. Regarding the quantity of heat transformed into work, this is regulated by the degree of expansion that is permitted it. The greater the degree to which it is allowed to expand, the greater the amount of energy that can be extracted from it, but in carrying the expansion to excess the variation of the initial volume of the gas during the stroke is made to alter within extreme limits. It will be quite evident that this extreme variation of volume cannot be realized in motors in actual service without the employment of an excessively high compression, that is, by further reducing, as far as practical, the volume of the gas to a point where it is subjected to a degree of heat equivalent to almost instantaneous combustion (explosion), or progressive combustion (Diesel motor), in order to convert a minimum initial value to one as high as possible. It is well to observe that the degree of expansion does not depend at all on the relative amount of travel of the piston (contrary to the generally prevailing opinion), but solely on the relation that the initial volume (at the end of the compression stroke) bears to the final volume of the gaseous mixture.

Some Advantages of High Compression.

The advantage, from a thermodynamic point of view, of the employment of high compression, or, to put it in another form, an extreme variation of volume of a gaseous fluid, may be readily calculated in a case where both the compression and the expansion are adiabatic, by which the amount that they can accomplish in a very short time can better be calculated, this being the case of the automobile motor with its extremely high angular velocity. Under these conditions, there is obtained, as an expression of the energy developed, the equation in which:

$$W = Eq \left[1 - \left(\frac{p_1}{p_2} \right)^{\frac{k-1}{k}} \right] = Eq \left[1 - \left(\frac{v}{V} \right)^{k-1} \right] \quad (3)$$

In this E is the mechanical equivalent of the calories, q the total quantity of heat generated by the explosion, p_1 and V , p_2 and v , the pressures and volumes of the gaseous mass at the beginning and the termination of the phase of compression, and k the ratio $\frac{C}{c}$ of the thermic capacities at constant pressure and volume, a ratio that does not vary sensibly, notwithstanding that it is subject to an increase of capacities with the temperature.

*Translated from "Bulletin Officiel de la Commission Technique."

These two equations show that the *thermodynamic product*

$$\frac{W}{Eg} = 1 - \left(\frac{p_1}{p_2}\right)^{\frac{1}{k}-1} = 1 - \left(\frac{v}{V}\right)^{k-1} \quad (4)$$

will be much greater, if the compression p_2 of the mixture is carried further, or its initial volume v correspondingly reduced with regard to the volume V at the end of expansion.

Experience has constantly demonstrated the economy to be gained with high compression, or, to put it in another way, an extreme variation in the volume of the gaseous mixture. In the first Lenoir gas engine the expansion was in the ratio of but 1 to 2, and the fuel consumption amounted to 3,000 liters of illuminating gas per horsepower hour, while in the Cateau motor, experimented with by M. A. Witz in 1903, this was reduced to 368 liters. the expansion or variation of volume being in the ratio of 1 to 6.

Greatly Reduced Fuel Consumption.

The fuel consumption in the case of gasoline motors has followed a similar march of progress, dropping from 1,100 grams per horsepower hour in the case of some of the earlier models in which the ratio of expansion was 1 to 3, to 180 grams of low grade oil in the four-cycle Diesel motor, in which a variation of 12.5 to 1 is attained, corresponding to a compression of 35 atmospheres. In the case of motors in which the carburetion of the charge is effected prior to its entrance to the cylinder, it is evident that carrying the compression to such an extent is not possible by reason of the fact that spontaneous combustion would take place long before such a high value was reached, and this is exactly the factor that limits the quantity of heat that is transformable into energy in this type of motor. But the compression of a gaseous mixture, when carried to such a high value as to render ignition by means of spontaneous combustion practical, presents the double advantage of rendering every mixture explosive, regardless of how poorly it may be carbureted. This fact is one that permits of a rational regulation of the engine, that is, economically, as in the Diesel motor, in which the amount of power developed is regulated by means of the degree of the carburetion of the charge, thus doing away with the necessity of advancing the point of ignition with all its inconveniences, a further advantage being found in the instantaneity of the burning of the mixture under the high compression actually employed in these engines, as revealed by indicator cards.

On the other hand, it is well known that the *density*, or, what amounts to the same thing, the pressure of an explosive mixture, is feeble, while the rate of propagation of the explosive wave is slow. This is such that in mines containing firedamp it has been frequently established by the miners that the speed of the propagation of the flame does not exceed the pace of a man walking slowly, which is less than 3.6 kilometers per hour, or about 1 meter per second. MM. Mallard and Le Chatelier have observed the same thing under conditions that are comparable in every way with those found in the explosive motor, that the speed of the propagation of the flame does not exceed .25 meter per second in weak mixtures. If, on the contrary, the explosive mixture is compressed to a point three times higher than that at which spontaneous combustion occurs, the least rise in temperature, and in consequence in pressure, is sufficient to fire it *simultaneously in every part*.

Speed of Flame Propagation.

The experiments of MM. Vielle and Berthelot have demonstrated that in such a case the explosive wave may attain a speed of 2,000 meters per second, or almost six times more than is possible in the open air. To resume, it may again be stated that, in augmenting the compression, the thermodynamic product of the motor is increased, and, as we have already seen, the necessity for advancing the point of ignition with all its inconveniences is totally done away with. Besides which, there is reduced just at the moment when it is most necessary that action of the walls of the combustion chamber, which designers have really been striving to augment by placing the inlet and exhaust valves in chambers or pockets, the surface of the walls of which is nearly double

that exposed to the action of the incandescent gas, where the valves are located in the head of the cylinder—an expedient that has already been adopted by several progressive designers.

We have already seen that the amount of energy developed by the explosion of a mass of gas during the total piston travel is equal to the product of the mean pressure developed by the variation of the volume of that mass. But in practice it is not sufficient merely to produce this work; it must be produced in the shortest possible time. It is quite evident, in fact, that a motor running ten or twenty times faster than another will accomplish in that much less *time* the same amount of work, and the rapidity of its work will be ten or twenty times greater.

It will not be amiss to dwell somewhat here, after our colleague, M. Hospitalier, on the distinction between the terms force, work and power—mechanical quantities that are quite distinct, but which are only too often confused to-day, not alone in current conversation but in technical writings. A *force* cannot be utilized industrially, except in as far as it is capable of producing displacement or change of position; of overcoming the resistance which is opposed to it. The product FL of this displacement L by the value F of the force exerted following the displacement is the measure of the work effected. The quotient of this work FL , by the time T employed in its execution, is the measure of the *speed or activity of the work*, or, to perpetuate an expression, the *power* of the motor may be equally well defined and measured by the product of the *force* by the *speed of displacement* at its point of application. If a comparison be permissible, we should say that the *work* is to the *power* as the *task* of effecting it is to the *rate* of its execution of that task, with relation to the time.

The work produced by the explosion motor is essentially *spasmodic*, or *periodic*, the *mean power* P being equal to the quotient of the work of the cylinder divided by the length of the period of its cycle T , which is determined by the formula:

$$P = \frac{(V-v) p_m}{T} \quad (5)$$

Influence of the Time Element.

If we designate by n the number of cycles effected by the motor in a given unit of time, a second for example, it is clear that the relation of the unit to the duration T of each cycle is identically the same as that of the relation that the number of cycles n bears to the time unit, as a result of which we have the formula:

$$\frac{1}{T} = \frac{n}{1''} \quad (6)$$

from which the mean power developed by the motor may be defined as equivalent to the *periodic work* by the product of that work times its frequency n . This frequency n , with which each cylinder repeats its stroke, may be readily deduced from the angular velocity of the motor. If it be observed that the motor is making ω r.p.m. its speed in turns per second will be equal to $\omega : 60$ turns per second, and as each actual cycle of the motor calls for two turns of the crankshaft, the frequency n of the work of each cylinder is equal to $\frac{\omega}{2 \cdot 60}$ and the power developed is expressed by the formula:

$$P = (V-v) \cdot p_m \cdot \frac{\omega}{2 \cdot 60}$$

or by

$$P = \frac{\pi D^3}{4} C \cdot p_m \cdot \frac{\omega}{2 \cdot 60} \quad (7)$$

in which D and C designate respectively the diameter of the piston and its total travel.

The total power developed by an explosion motor of given cylinder dimensions depends, then, upon two variables, the *mean pressure* p_m , and the frequency $\frac{\omega}{2 \cdot 60}$ with which the periodic work is repeated in that cylinder, and this is proportional to the angular velocity of the motor. It is clear that if the mean pressure be

constant the power developed by the motor will be proportional to its angular velocity. But experience has shown that this mean pressure, far from maintaining a constant value, continually decreases in proportion as the speed increases, in such a manner that the product of these two variables, which regulate the power of the motor, passes a maximum. This decrease in mean pressure is in evidence on indicator cards taken of the cycle, and drops as the speed of the motor increases, owing to the decrease of the couple or motor moment, exercised by the latter, which is equal to that mean pressure as may be readily demonstrated.

If this be designated by n , the product of the motor, or, rather, the relation that the power P' , developed at the crankshaft, bears to the indicated power P , then we have the equation

$$P' = \eta P$$

The power P' developed at the crankshaft is equal to the product of the work per turn (which is equal to the product of a certain force F applied tangentially at a distance L from the axis of the motor, by the length of the circular path traversed in one turn by its point of application) by the number of turns $\frac{\omega}{60}$ made by the crankshaft per second. This gives us:

$$2 \pi L \cdot F \cdot \frac{\omega}{60} = \frac{\pi D^2}{4} C \cdot p_m \cdot \frac{\omega}{2 \cdot 60} \cdot \eta \quad (8)$$

or, since the factor ω is common,

$$2 \pi L \cdot F = \left(\frac{\pi D^2}{4} C \right) \frac{\eta}{2} \cdot p_m \quad (9)$$

Now the product FL of the force F by the distance L of the axis of rotation measures the value of the couple or motor moment developed, and the formula (9) demonstrates that if the output η of the motor be constant its couple FL , or the work per turn $2 \pi FL$ is simply proportional to the mean pressure p_m , or the mean effort $\frac{D^2}{4}$ exerted against the head of the piston, and consequently to the work

$$\frac{\pi D^2}{4} C \cdot p_m$$

developed by the cylinder.

It will suffice to determine experimentally, for example, the relation between the work per turn of the motor crankshaft to its angular velocity, to learn what relation the work of the cylinder bears to that same angular velocity. This relation is illustrated by the curve $M' M'' M'''$ of the chart Fig. 1, taken in 1903, on a motor capable of developing 18 horsepower, and published by us at that time in *La Vie Automobile*. The experimental determination of this curve is very simply effected by varying the pressure of the brake and in measuring the angular velocity in turns per minute, for example, corresponding to the value of each

change of brake pressure. It is clear that the resulting curve reaches its maximum value corresponding to the resistant moment opposed by the brake shortly after the minimum speed that the motor can maintain is reached, and this moment constantly diminishes thereafter in proportion to the increase in angular velocity. Now, as the formula (8) demonstrates that there is a fixed ratio between the value of the motor moment and that of the work of the cylinder, which is evident, all things being otherwise equal and proportional to the quantity, or, more exactly speaking, to the mass of the gaseous mixture drawn in for each explosion, it is at once evident that the motor inspires less and less in each cylinder in proportion to the increase in the angular velocity. The charges, sufficiently voluminous at the start, become less and less copious.

And what does this indicate? Simply this, that if the depression produced by the downward travel of the piston increases with its linear speed, and in consequence with the angular velocity of the motor, on the contrary, the duration of the refilling of the combustion chamber is inversely proportional to that same angular velocity. Now, if the weight, or, more accurately speaking, the mass of the explosive mixture aspired were the direct function of the speed of displacement of the piston and inversely of the duration of the inspiration, it could easily be conceded that the mean mechanical effort set in motion by the power cylinder reached a maximum at a certain value of the angular velocity, which is the same as that corresponding to the maximum power developed by the motor at its crankshaft.

This last may be easily deduced by an extremely simple graphic calculation of the curve of the moment or motor couple. In fact, we have already seen above (equation (8)) that the power P' , developed by the motor at its crankshaft, is equal to the product of the work per turn by the frequency $\frac{\omega}{60}$ or $\frac{10\omega}{600}$

$$2 \pi L \cdot F \cdot \frac{\omega}{60} = P' \quad (10)$$

which gives us the equation:

$$\frac{P'}{2 \pi L \cdot F} = \frac{10 \omega}{600} \quad (11)$$

If we raise to the point having for abscissa 600, the ordinate 600 S, and project on that ordinate all the points of the curve $M' M''$, so that M'' corresponds to the abscissa of 800 turns per minute, and then join the origin at the point projected M'' , by a straight line terminating at W'' on the ordinate 800 M'' , the triangles $o(800) W''$ and $o(600) M''$ will give the proportion

$$\frac{W''(800)}{M''(600)} = \frac{o(800)}{o(600)}$$

which is none other than the proportion (11). Moreover W'' is a point of the characteristic curve of the power developed by the motor at its crankshaft. This was also determined by the points $W' W'' W'''$ of the power characteristic of the motor experimented on. It will be seen that this power increases proportionately to the angular velocity by the small values of the latter; then it passes a maximum, after which they decrease constantly. It will be equally evident that if the mass of the explosive mixture were constant and independent of the speed, the same would be true of the couple or the moment, and the power developed, of which the curve would be represented by a direct line, such as OP , would be proportional to the angular velocity of the motor.

(To be continued.)

Now it is the "air hog" who is causing trouble in England instead of the time-honored road animal of the same breed. He is the balloonist, who, with dragging anchor or other appurtenances peculiar to aerial navigation, does damage to windows, hothouses, fences, shrubbery and lawns, and does not pay up for the damage he causes the suburban resident. It is already proposed to make balloonists carry numbers on their airships, so that they may be identified.

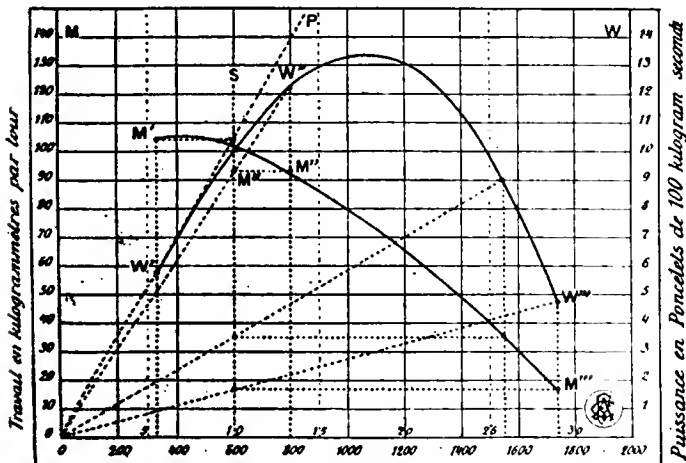
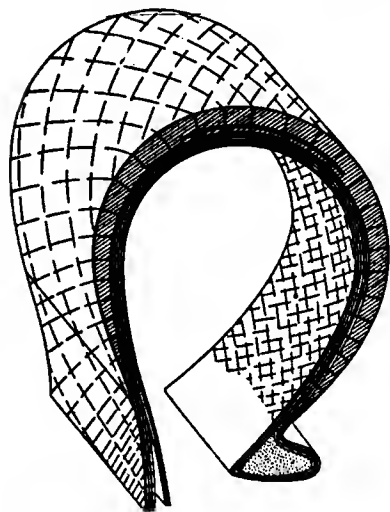


FIG. 1.—The figures 5, 10, 15, 20, etc., represent the angular velocity of the motor in turns per second, and the figures 0, 200, 400, etc., in turns per minute.

A NEW FORM OF TIRE CONSTRUCTION.

With a view to overcoming the tendency to disintegrate inherent in some forms of pneumatic tires, this being caused by the bending or crinkling of the tire body where the latter flattens against the road surface due to the weight of the load, F. A. Bragg, of Springfield, Mass., has invented a form of tire construction in which the various layers of material are mechanically bound together in addition to the vulcanization, this being done subsequently in the ordinary manner. As the bend in the



CROSS SECTION OF THE BRAGG TIRE.

movement of the layers of fabric to a minimum, the body of the Bragg tire is quilted by sewing, as will be apparent from the accompanying illustration, which pictures its construction. This is done before the vulcanizing process is carried out and the thread or cord employed is previously permeated with a substance which, when the tire is finished, causes the former to become permanently adherent to the tire body. The quilting serves to reduce the area in which movement of one layer of fabric may take place relative to another to the space located between adjacent lines of stitching, no less than 16,000 stitches being required to complete a single outer shoe.

the tire wall mentioned is constantly being shifted circumferentially by the rotation of the wheel, every part of the fabric layers and their binding element is subjected to a great strain, eventually resulting in the separation of the various constituent layers of the tire body due to the working of one upon the other, or the tendency toward such movement set up by the strain in question.

To overcome this defect by means of a binding auxiliary to the cementing effect of the rubber in order to reduce the relative

THE SOCIETY OF AUTOMOBILE ENGINEERS.

The annual meeting and dinner of the Society of Automobile Engineers will be held at the New Grand Hotel, Broadway and Thirty-first street, Thursday, January 17. The meeting will be held at 2 P. M., and in addition to the election of officers and a general discussion the following papers will be read: "Simplicity," by Henry Ford; "Some Facts Pertaining to Electric Ignition," by Henri G. Chartain; "Some Features of Construction," by Thos. J. Fay; "Alcohol," by Thos. J. White; "Change Gears and Their Journals," by Henry Hess. The dinner is scheduled for 7:30 P. M., and members may invite guests.

A TECHNICAL NEWS BUREAU ESTABLISHED.

A bureau has been established in New York City to supply articles on the design, construction, sale and use of automobiles to the automobile and popular press. Arrangements have been made with a corps of experienced writers to prepare such matter upon demand, so that the requirements of an editor in any phase of the subject can be filled at short notice. Among these writers may be mentioned Herbert L. Towle, W. P. Stephens, Joseph Tracy, Harold H. Brown and Thomas L. White. Arrangements have also been made with Edwin Levick and Nathan Lazarnick to supply photographs especially taken to accompany the manuscripts. The organization is known as the Technical Press Bureau, and offices have been opened at 25 west Forty-second street. Management of the bureau is in the hands of Harry W. Perry, for the past five years associate editor of THE AUTOMOBILE and

more recently associated with H. F. Donaldson, publisher of the *Commercial Vehicle*. Connection with the latter periodical is still retained. Associated with him is Howard Greene, who for several years has been a writer on mechanical subjects on the staff of the *Horseless Age* and THE AUTOMOBILE, having concluded his connection with the latter with the close of the year. Although a specialty is to be made of automobile subjects, it is planned to furnish special articles from time to time for technical or class papers devoted to other lines.

AN IMPROVED FRENCH WINDSHIELD.

PARIS, Dec. 20.—Since its first appearance about a year ago the swinging windshield invented by M. Huillier has had immense success. Briefly, it consisted of a glass shield hinged at its upper edge to two upright side stays curved upward at their extremity, and a waterproof leather apron uniting its lower edge to the outside of the dashboard. Its disadvantage—a disadvantage common to the ordinary type of windshield—was that it could not be raised or lowered or put out of use when not required. The inventor has improved on the first model, as will be seen by the illustrations herewith. A metal upright stay is attached to each side of the dashboard, and on it slides a sector bearing a lighter stay to which the shield is hinged, and provided with a thumb-screw by which it can be retained at any desired height. By means of the sectors the shield can be placed at any distance from the driver, or when it is lowered can be maintained at any angle. A leather apron connects the lower edge of the shield with the dashboard. Fig. 1 shows the screen lowered; Fig. 2 illustrates the screen raised to a normal height. In Fig. 3 it is lowered and placed at an angle, as it would be used in heavy rain, giving the driver some protection while offering no obstruction to the view; and in Fig. 4 the screen is raised as high as possible. A further advantage of the shield is that it can be fitted on any car without special measurement, and in position 2, 3 and 4 it may be used between front and rear seats. The shield is patented.

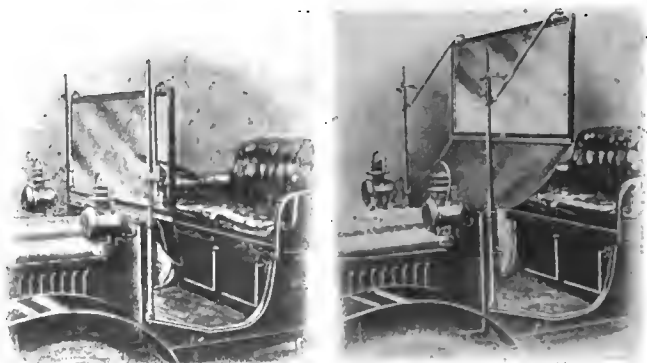


FIG. 1

FIG. 2

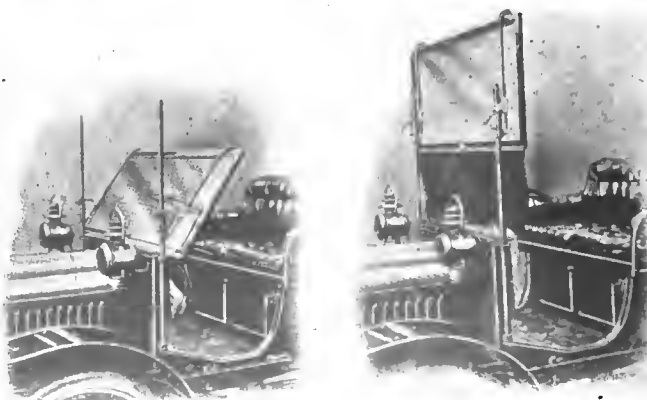


FIG. 3

FIG. 4

IMPROVED SWINGING WINDSHIELD, SHOWN AT PARIS SALON.

OPINIONS CONCERNING TWO-CYCLE ENGINES

JUDGING from the varied comment elicited by the article on the two-cycle engine, by C. P. Malcolm, which has been appearing in *THE AUTOMOBILE*, it is evident that the interest in this type of motor is far more widespread than would appear to be the case to the casual observer, particularly in view of the fact that but one firm has had the courage of its convictions in this connection where the automobile is concerned. That the two-cycle motor represents the ultimate stage of the evolution of the internal combustion engine, is the firm belief of many authorities whose experience and standing entitles their opinions to considerable weight. Simplicity, with a maximum of power from a minimum of weight, must always be the aim of the designer, as it has been in the past, and there are many who incline to the opinion that the realization of this points in the direction of the perfection of the two-cycle idea and none other. There are those, however, who maintain that two-cycle operation and high speeds are incompatible with a high degree of efficiency and will never be realized in practise. Accordingly they are seeking simplicity in another direction while still retaining the four-cycle principle, in order that a more complete scavenging of the combustion chamber between strokes may be brought about and a higher degree of compression employed, both of these being universally conceded to be among the first essentials of efficient operation. This is the case of Charles E. Duryea, whose letter is appended here, as he is of the opinion that the success of the rotary valve will eliminate the necessity for further employment of the two-cycle principle.

AN EVOLUTION IN AUTO ENGINE BUILDING.

Editor *THE AUTOMOBILE*:

Since 1899 there has been a steady advance and evolution of building engines for automobile use. At that time the Otto type of engine was the accepted type for automobile service, principally because of its being a high-speed engine, which allowed of using a similar engine utilizing this high speed and then gearing back by the means of chains to the driving axle. This type of engine was used exclusively for automobiles until 1899, when the Elmore Manufacturing Company, of Clyde, O., entered the field with a motor of the two-cycle type. This type of motor was used almost exclusively for marine purposes, and was always supposed to be a motor of very limited speed; in fact, the speed was so low that it was not well adapted for automobile work, and therefore did not have much consideration. The Elmore company, however, seeing the possibilities of the two-cycle motor, decided that it could be improved so as to make it the ideal motor for the automobile.

The first two-cycle engines, in fact nearly all of them in marine use, were of the type using valves in the crankcase, or a great many engines had been made with valves in the head of the cylinder, the same as the four-cycle, but the prevailing type was the one using a check valve in the inlet to the crankcase. The Elmore company soon found that the prevailing type of motor as used for marine purposes was not at all available for automobile purposes, and they began working on the Day, or three-port system. It took considerable experimenting and time to get the engine proportioned so as to produce the results expected, but a steady advance was made until now the evolution is practically complete. For three years past the Elmore motor has been acknowledged to possess all the qualities of the perfected motor for automobile service. It has come up fully to the expectations of its builders' and gas engine experts all over the world predict that it will be the motor of the future.

History has shown that when the limit of progress in one direction is reached, further progress has come through radical departure from these lines. However, evolutions come slow, as it is hard to make a change from one system to another until it has been clearly shown that the evolutionary system is better. In the case of the two-cycle engine this has been shown to everyone who has made a study of the situation; it is only those who are prejudiced in favor of their own system who are still doubtful. The Elmore company has made further advance in the Day type of engine than anyone else. Their product of automobiles is so well and favorably known that comment is unnecessary further than to explain the difference, or rather, similarity, of their motor to the four-cycle type.

It is generally agreed among all mechanical men that simplicity is the point to be obtained. In the two-cycle motor this point has been gained, for not only does it do away with all the complicated parts of the four-cycle engine, but theoretically it doubles the power. This means that not only is the two-cycle engine a great deal more powerful than its prototype, but it is much lighter in weight, and as it does away with most of the troublesome parts of the four-cycle it is consequently more reliable, especially in the hands of the amateur, as there are absolutely no parts that are subject to wear or displacement, even after very long and very hard service.

All history has shown that every evolution in the nature of an improvement is at first ignored, and as it gathers strength and momentum is fought by those whose interests it seems to affect. This has been true of the evolution of the two-cycle. There are probably comparatively few people who know what constitutes the difference between what is called the two-stroke cycle and the four-

(Continued on first column, page 54.)

MR. MALCOLM'S ADDED EXPLANATION.

Editor *THE AUTOMOBILE*:

I noted W. Fahrenbrink's Inquiry No. 507, concerning two-cycle engines, and I think that I might be able to give some additional information that might be of considerable value to him. In designing the ports of a two-cycle engine it is necessary to have the exhaust port as much wider than the inlet port as necessary to permit all of the pressure of the exhaust to escape before the inlet port begins to open. Before the exhaust port begins to open, the burning charge is at a bright red heat, and would ignite any fresh charge that came in contact with it, but, as in compressing a charge before it is ignited, the heat of compression keeps exact pace with the degree of compression, so in discharging the ignited gases the temperature will keep exact pace with the pressure, and the exhaust gases, which were at nearly a white heat before the port began to open, will be black as they are expanded to atmospheric pressure by being discharged in the open air. If this occurs before the inlet port opens, there will be no danger of back firing into the crankcase. In a cylinder of four or five inches stroke, the inlet port should be 3-8 inch to 1-2 inch wide, and the exhaust port from 5-8 inch to 3-4 inch wide; that is, there should be 1-4 inch lead in the exhaust port.

The bottom of these ports should be on the same vertical plane as the top of the piston when it is on its lower center, and they should extend clear around the circumference of the cylinder, with about one inch bridges to separate the exhaust from the inlet port. There should be about three very thin bridges, say about 1-8 inch thick, across the inlet port, and one, about 1-2 inch wide, across the exhaust port.

The object of extending the ports clear around the cylinder is not only to get the greatest port capacity with the least possible loss of effective piston stroke, but also because that is the only way by which the exhaust gases can be effectually swept from the cylinder by the incoming charge. This construction of ports has contributed more towards making the two-cycle an efficient gas engine than any other one thing.

It is only a few years since the usual, in fact the universal practice, was to make the ports of a six-inch bore cylinder about 2 1-2 inches, or at the farthest 3 inches long, and the charge would be deflected to the inside of the cylinder and over the top and down the exhaust side, and out of the exhaust port, leaving the larger part of the exhaust gases on each side of it undisturbed in the cylinder. If you have thick bridges across the intake port, there will be arches of the exhaust gases, extending across the cylinder from each bridge to the exhaust port, that the incoming charge cannot sweep out ahead of it, because they are shielded by the bridges. It is necessary to have bridges across the ports to prevent the piston rings from springing out into the port and catching, and probably breaking, but 1-16 inch bridge will steady the rings across the port just as well as thicker ones, but 1-8 inch is about as thin as you can bore out the cylinder with and not have the edges crumbled by the cutting tool. The exhaust port bridge, or bridges, should not be so thin, as there is nothing to be gained by it, and they will get hot quicker, being exposed to the hot exhaust gases for an instant, each revolution of the engine. The exhaust port being so much wider than the intake port, the port room that thick bridges take up is not needed for port capacity, but do not put more than one 1-2 inch bridge in unless the bore is over 6 inches.

In designing two-cycle engines the usual practice is to make the crankcase compression space as small as possible in order to get as

(Continued on second column, page 54.)

AN EVOLUTION IN AUTO ENGINE BUILDING.

(Continued from first column, page 53.)

stroke cycle engine. The difference is in the manner of admitting gas to the combustion chamber of the engine. In the four-cycle this is accomplished by a number of very accurately finished valves, which are operated by a complicated system of cams, levers and springs. This system is subject to variation, first in the timing of the valves, on which probably no two builders agree—in fact, experimenting is going on even at this late date to determine just what timing is proper for the valves of a four-cycle engine. Even if the valves are timed right in the first place, they are subject to the variation of the valves corroding as they are exposed to the extremely hot gases of the combustion chamber, and they are also subject to variation from lost motion in levers or cams. These valves perform the service of letting the gas into the cylinders, and also let the gas out of the cylinders, so that one revolution is used for the working stroke or power of the engine, and the next revolution the engine is idle and does no work at all, therefore the four-cycle engine is working only half the time. This idle stroke is a great detriment to the four-cycle engine on account of having to carry a very heavy flywheel to keep the momentum of the engine up while it is doing no work, which, as said above, is one-half the time. As stated above, the two-cycle engine not only does away with the highly sensitive valves and their attendant mechanism, but also has no idle stroke, producing a power stroke at every revolution, even though carrying much less compression, which allows of easier starting and much smoother running, and the two-cycle, by losing this idle stroke, gains infinitely more power, with a smoothness of action that it would take double the number of cylinders of the four-cycle type to produce. This has been acknowledged by builders of the Otto type of engine by the fact that they are multiplying their cylinders in order to overcome these spasmodic impulses and the elimination of the heavy flywheel, but in multiplying the cylinders they also multiply the parts for actuating the valves.

The entire action of the four-cycle having been explained, it will be very easy for even a layman to understand the principle and advantages of the two-cycle as now explained. The piston in the two-cycle engine performs its duty just the same as the piston in a steam engine, which nearly every one understands. In its backward and forward movement it opens and closes the inlet and outlet ports for admitting the gases into the explosion chamber and for letting it out after being burned. It performs this function with an evenness and reliability that is surprising to the oldest steam engineers. As every one knows, the piston of a gas engine, as well as a steam engine, is not subject to wear or displacement, and on this account the longevity of the two-cycle engine cannot be questioned. In fact it has been repeatedly proven in hundreds of cases of actual practice that a two-cycle motor of the best make, even after very long and hard service, will show the same or more power than it did when new. Unfortunately for those who wish to design a two-cycle engine, there is no reliable data in the hands of anyone but those who have had years of experience in the practical making and marketing of this type of engine.

While the Elmore company has been eminently successful in building this type of engine, it was proven by their first experiments that faulty design will entirely nullify all the natural advantages of the two-cycle engine, and that considerable experience must be possessed by the designer to take advantage of its simplicity.

Clyde, O.

B. A. BECKER.

DISSENTS FROM MR. MALCOLM'S STATEMENT.

Editor THE AUTOMOBILE:

In Mr. Malcolm's article on the "Development of the Two-Cycle Engine, Part II," is a statement that "With the engine running at any speed the valve will not lift, so the only practical way of using this device is to place the valve in a horizontal position"—all this referring to the small momentum valve in the piston head. Where does Mr. Malcolm get his authority for this startling assertion? The combination two-and-four-cycle engines, made in this country by a Chicago concern, were fitted with momentum valves of the type which Mr. Malcolm so emphatically condemns, and, whatever troubles may have been had with their other details, trouble with these valves was not one of them. Also, in the early Daimler V-shaped gasoline engines, which gave most excellent service, piston air valves were regularly used to supply additional air for much the same reason as constitutes the excuse for the auxiliary air admission of the modern compensating carbureter. These valves were not only held by the momentum, but were also held by very stout springs, and it is not on record that there ever was any trouble with their failing to open. Some of the engines had an arrangement whereby the spring pressure was relieved mechanically at the end of the stroke, but even this was not applied to all of the engines. I would be very much interested to know what actual tests Mr. Malcolm is familiar with, as a basis for his condemnation of this type of valve, located horizontally in the top of the piston.

New York City.

ROBERT MILLER.

MR. MALCOLM'S ADDED EXPLANATION.

(Continued from second column, page 53.)

high pressure as you can, so as to move the charge into the cylinder as quickly as can be. Some even go so far as to fill up the piston as much as they can and core it out hollow, so that it has the appearance of a solid piston, with a space in it for the end of the connecting rod. I do not think this is good practice. But you need not be afraid of back-firing with ports constructed as described, no matter how much crankcase compression you may have, for the igniting heat is all out of the cylinder before there is any chance for the charge compressed in the crankcase to get into or have any communication with the cylinder.

I do not know the size nor the style of engine that he intends building, but have assumed that they were vertical cylinders, and, if they are four or five inches bore and stroke, they should be able to run at least 2,000 R. P. M. for their highest efficiency, with the ports constructed as indicated.

A very good form of deflector, though not the best, is to have it a little farther from the cylinder walls than the inlet port is wide, and about one and one-half times the width of the port high, straight up and parallel with the cylinder walls and extending around the piston the length of the inlet port, at the ends of which it turns at a right angle into the cylinder walls. This deflector should be securely fastened to the piston if not cast integral with it, and turned off with the piston. The deflector and the part of the piston above the first piston ring should be turned off 1-100 inch smaller than the bore of the cylinder, or the heat on the surface of the piston head will expand it so as to cause the piston to set fast in the cylinder until it is allowed to cool off. The edges of the deflector also may scratch the cylinder.

If you place these two cylinders vertically, and side by side, with the cranks opposite, or 180 degrees apart, you will have a perfectly balanced engine and will get as many explosive impulses as you would with four cylinders of the four-cycle type, and from 50 to 75 per cent. more power than you could get from two four-cycle cylinders of the same size. As the cylinders are nearly cut in two by the ports, the walls of the chambers surrounding them should be cast thick enough to give the necessary strength to the cylinder. To regulate the speed, it is better to throttle the intake port of the cylinder than to throttle between the crankcase admission and the carbureter, although either will do, if the inlet to the crankcase is a check valve, or anything but a third port.

C. P. MALCOLM.

Detroit, Mich.

MR. DURYEA ON ROTARY VALVES.

Editor THE AUTOMOBILE:

Your correspondent, Mr. Putnam, asks concerning the rotary valve exhibited by us at the New York show, and we think likely more information would be appreciated by him. We have been testing this valve as time and opportunity permitted for several seasons and have built it in two or three sizes and in several forms. We have used this valve both taper and straight, and also along in separate lengths, one for each cylinder. Our experience points to the single piece straight valve carefully made as the most simple and satisfactory form. We have run engines containing this valve until the cylinders were so dry from lack of lubrication that the engine stopped. We did this to find out whether or not the valve would give trouble. We found in each case that the valve was still in good order because it is on the underside of the cylinder, where it gets oil from the piston at every piston movement and where any oil that splashes against the cylinder head flows by gravity into the valve. Further, since the valve is on the underside it is sure to get water more free from steam bubbles than the upper walls of the cylinder, while the presence of water in the center of the valve insures that it cannot overheat. From our experience we believe that regrinding will not be necessary oftener than once per season, and that when reground and fitted with new bushings the valve will be ready for another season's use at less expense than the ordinary poppet valves can be maintained. The saving in noise, flexibility, timing trouble and adjustment is enormous, and this device, in our opinion, makes the four-cycle engine as simple as a two-cycle, while retaining the four-cycle advantages.

Reading, Pa.

C. E. DURYEA.

THE AUTO ADVANCING INTO INDIA.

Few people realize the strides automobiling has made in India within the past two years. Cars are penetrating into the far away mountain fastnesses of the northern border land. An auto recently sold to a purchaser at Newshera made the difficult trip successfully to Dargai and the Malakand Pass, which it ascended to a height of 3,000 feet, making a continuous climb of six miles. Another trip by the same car was successfully made to the mouth of the Khyber Pass.

LETTERS INTERESTING AND INSTRUCTIVE

The Merits of Steel and Cast-iron Bearings.

Editor THE AUTOMOBILE:

[527.]—What are the comparative merits of steel and cast-iron as materials for plain bearings, as compared with the bronzes and babbitt more commonly used for this purpose? I notice that many gasoline motors of high reputation have steel-bushed connecting rod eyes working on steel piston pins, while others have steel piston pins held tightly by the connecting rod and oscillated in the piston, thus giving steel to steel in the one case and steel to cast-iron in the other. If these materials can be made to wear so well under the severe duty encountered within the hot piston, not even provision for adjustment being usually made, why should they not prove equally serviceable and durable for crankpin and crankshaft bearings, besides being considerably less expensive to manufacture?

New Rochelle, N. Y.

ERNEST C. HENCKEL.

The argument usually urged in favor of bronze and babbitt plain bearings is their comparative immunity from troubles due to faulty or inadequate lubrication. This is especially true of babbitt, the best qualities of which are possessed of really remarkable "anti-friction" properties and are capable of giving some service when dry. Moreover, when run dry too long they simply melt out without injury to the expensive shaft, thus bringing about a difficulty easily corrected by a comparatively simple and inexpensive replacement. Bronze and brass are more likely to injure shafts, while with steel or cast-iron to steel, the briefest failure of the lubrication system will be followed by overheating, scoring and seizing, to the ruination of both bearing and journal. A very important advantage of babbitt is the facility with which it can be cast in place around the journal, thus producing a close fit and perfect alignment at a minimum cost. Cast-iron usually contains an immense number of minute particles of graphitic carbon, disseminated throughout its mass, which is supposed to account for its superiority to steel as a material for sliding surfaces. With the improved and almost perfectly-reliable lubricating systems now in use, there is no particular reason why steel and cast-iron bearings should not come more and more into use. They have been used with the greatest success on some of the heaviest steam engines and other machinery ever built, and are recognized as good practice in several important departments of mechanical engineering. The subject is well worth the serious consideration of practical auto builders.

The Direction of Engine Rotation.

Editor THE AUTOMOBILE:

[528.]—Though not the owner or user of a car, I am a regular reader of "The Automobile," and as such take a great interest in the industry. Recently a friend of mine and I have had an argument about the direction in which an automobile engine, gasoline, revolves. To settle this argument, we will appreciate it if you will explain in "Letters Interesting and Instructive" whether an automobile engine can run either way, and which direction, if either, is usually preferred.

THOMAS CLANCARTY.

Latrobe, Pa.

There is no possible reason why an automobile engine should not be built to run one way just as well as the other, though almost invariably they are made to run in such a direction that the starting crank must be turned in the direction of the hands of a clock to effect the starting. Automobile engines of the four-cycle internal-combustion type rarely are capable of being reversed, however, if this is the idea you have in mind. To be able to reverse, self-starting would be presupposed, and since self-starting is neither highly developed nor extensively applied, the provision of reversing cams and the other necessary adjuncts would still require cranking to produce the change in direction. A few self-starting and reversing four-cycle motors have been made, and at least one is on the market to-day, while it seems probable that more may be built in the future. Most two-cycle engines can be reversed—usually by simple manipulation of the spark while running.

An Easy One and Then a Hard One.

Editor THE AUTOMOBILE:

[529.]—Were any of the cars in the Vanderbilt race of the two-cycle type? What is the idea of such manufacturers as the Mercedes, Fiat, De Dietrich, Pope-Toledo, Locomobile, and Thomas in using chain-drive after seeing shaft-driven cars win all the cup races to date? What is the trouble with a 30-horsepower shaft-driven car with a four-cylinder, four-cycle engine, which acts as follows: The car starts off perfectly and runs nicely for about a quarter of a mile, and then, cylinder by cylinder, the motor ceases working until only one cylinder is working and then, cylinder by cylinder, begins working again? This happens repeatedly, especially when one attempts to speed the engine or in taking a grade.

Bayside, N. Y.

A SUBSCRIBER.

No cars driven by two-cycle engines have been entered in any of the three Vanderbilt Cup races. Your next question is simply enough answered by the fact that cars equipped with double-chain drive have won race after race in the great road contests of Europe, several of which have been won over greater distances and at higher average speeds than have resulted from any Vanderbilt Cup race. This makes it perfectly reasonable that the advocates of double-chain drive should consider this detail of construction no bar to success. It is very difficult, without knowing more details of your car's construction and condition, to diagnose its troubles with any degree of positiveness. Your meager description sounds like carburetor trouble of some sort, such as might occur if the fuel feed were partially obstructed in some manner, particularly if the obstruction were such as to permit the float chamber to fill slowly, after being exhausted quickly by a heavy demand for power. Why the cylinders should cut out one after another instead of all dying down together from this cause, however, unless the intake piping has most unequal leads, is beyond us, and we shall be interested to see if the ingenuity or experience of our readers may suggest some more plausible explanation than we are able to advance.

Some Mixture and Ignition Phenomena.

Editor THE AUTOMOBILE:

[530.]—Would you be so kind as to answer the following questions in your journal? I understand that an explosive mixture of gas in a motor will take time (even though it be but a trifle) to burn up entirely. It is understood that we are using perfect mixture, not too rich or too weak. A fully retarded spark takes place in the combustion chamber just as the piston is returning on its outward stroke. The full charge of gas will not be entirely burned until the piston has traveled some distance on its outward stroke, and it is not long after that the exhaust valve opens to let the burned charge out. In my idea a charge fired by a retarded spark ought to give little power and hardly any heat at all, being that the burned charge is in the cylinder but a short time. Others say that a retarded spark will create heat. Why?

An advanced spark, it is said, will run a motor cool and faster than a retarded spark. My view is this: An advanced spark will enter the cylinder combustion chamber just before the piston reaches the dead center, and therefore the entire charge would be burned up entirely just as the piston is at dead center (if sooner will cause a knock). Compression is then at its highest, the explosion is greatest, and speed highest. Why, then, doesn't a strong explosion and high speed, and besides allowing the burned gas to remain in the cylinder much longer than with a retarded spark, cause more heat than with a retarded spark? The above is my own theory, and would like to know where I am at fault.

Chicago, Ill.

LOUIS ROCCA.

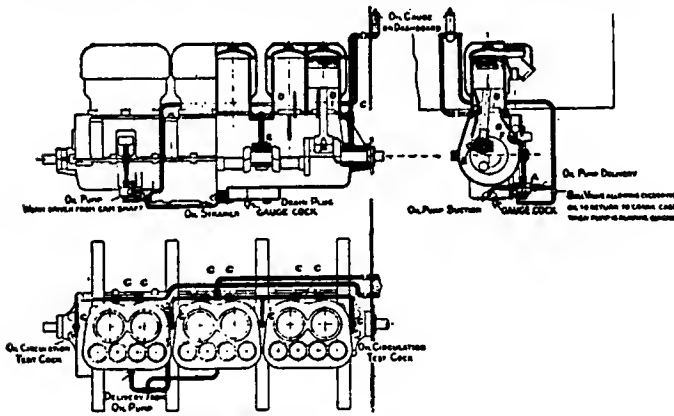
You are perfectly correct in assuming that the combustion of the charge of gaseous fuel within a gasoline-engine cylinder takes time, though it is a common error to regard the combustion as much slower than it really is. With retarded ignition, as in the case you assume, the power result is small because the combustion, with consequent pressure development, takes place after the mechanical elements of the engine—the piston, connecting rod and crank—have progressed to a position that precludes utilization of the heat. But the heat is produced none the less, and

while the burned charge is in the cylinders only a short time, this simply means that it continues to burn as it passes out through the exhaust valve and on its way to the muffler. It only requires a very slight advance of the spark itself (not inconsistent with a considerable advance of the time of commutator contact) to insure completion of combustion by the time dead center is reached, but there is no reason why a knock should occur merely because of slightly greater advance, if all of the bearings are in good condition. As a matter of fact, the knock usually attributed to undue ignition advance can hardly appear until the advance is so great as nearly to stall the motor. Power may be lost, of course, as a result of less advance than this, but since all of the pressures work downward, both during the compression and explosion strokes, what would there be to occasion a pound or knock because of too early ignition in the compression stroke? It is the practical completion of combustion before the exhaust valve opens, with consequent utilization of the heat, that keeps a motor from overheating. On the other hand, the retarded combustion, with the result that the gases are in full flame as they pass through the exhaust valve, causes the troubles usually summed up in the single word "overheating."

A Simple and Efficient Lubricating System.

Editor THE AUTOMOBILE:

[531.]—In your issue of November 8 I have read with great interest the article on forced feed lubrication for motor car engines, and I inclose you full particulars and a diagram of the Napier system of lubrication, which, I think, you will agree with me, is better than



NAPIER SYSTEM OF CONSTANT OIL CIRCULATION.

any system of drip lubrication or any system of lubrication by which the skill of the operator is called into account. Since adopting it we have never yet had a case of a car having a fired bearing when in the hands of the ordinary user. This is a good deal to say, and really, unless the chauffeur was abominably stupid, I do not see how it could happen.

S. F. EDGE.

London, England.

There are no drips in connection with the Napier oiling system, and merely one oil gauge, situated on the dash. On the left side of the crankcase a small direct-acting pump A is carried, which is driven by a worm on the half-time shaft. The oil is collected by this pump through a strainer from a well in the bottom of the crankcase. The amount of oil necessary is determined by means of a Napier gauge cock, operated by means of a lever inside the bonnet. The crank chamber is filled up each morning to the correct level, that is, until oil runs out of this small gauge cock; when this is obtained, the cock is shut and the lubrication of the car is right for the day.

The oil is delivered from the pump by means of a large bore copper tube, which carries it first of all through a sight feed B on the dashboard. From the dashboard, through another large bore copper tube, it is led to the middle of the offside of the engine, where it meets a T piece, and is then carried both backwards and forwards and distributed by means of oil studs C to the four main bearings direct, and also a certain definite determined amount is fed to each of the cylinders. Between the cylinders and the crankcase there is a metal shield limiting the splash from the crank

chamber to the pistons. This shield, having a turned-up lip D, catches the oil, retains a definite quantity always in the groove formed, and delivers a portion to the bearings E and to the camshaft F.

After being used, all the oil drains into the well of the crankcase, and, after passing through a strainer, goes back to the pump. Thus a certain definite quantity is delivered continuously to each of the bearings and also to the cylinders.

It will be noticed in the plan view that at the termination of the pipes leading to the two main end bearings of the engine, there are two small oil circulation test cocks. These are merely for test purposes, to make sure occasionally that the feeds are quite free, though the pipes themselves are purposely made of large bore to obviate the possibility of stoppage. Should anything happen to the pump, which would be immediately shown by the oil gauge on the dash, all that is needed is more oil in the crank chamber, lubricating by splash until the pump can be repaired. The mechanism for oiling the "big end" is shown in section in the small diagram, where the pipe will be seen leading downwards and squirting into the small scoop, carried by the big end, marked E. The pipe leading to the camshaft is marked G. The simplicity of the system is its chief advantage. It is certainly independent of any pressure, is self-contained, does away with all drips; it starts and stops with the engine and the lubrication in every case is directly proportional to the speed of the engine.

[EDITOR'S NOTE.—This system, with slight alterations in detail, is now in use on several American cars and is found to be very simple and efficient.]

ANSWER FROM THE ELMORE STANDPOINT.

Editor THE AUTOMOBILE:

[532.]—In your issue of December 20 we note a letter and your answer to some questions on the two-cycle motor. There are, undoubtedly, good and bad two-cycle engines, just as there are good and bad four-cycle engines. We think that in general your answer to the query is all right, but we would take exceptions to some parts of it, as we believe that our knowledge on this subject is more extended than any one else's, as we have done more experimenting in the matter than any one else in the world, and we have an actual production of cars extending over six years.

The valveless, two-cycle engine is, in our opinion, the most advanced type of internal combustion engine on the market to-day. We have made engines with valves and without, and we would consider that to make a two-cycle engine with valves would be simply to throw it back in development for several years, as it would then be subject to all the inaccuracy that is peculiar to the common four-cycle type of engine.

You speak of the screen in the by-pass becoming heated so that it would cause back-firing. We wish to correct you on this point, so far as it pertains to our own type of motor. Our screen is made of two layers of perforated steel inclosing a layer of fine mesh copper wire, on which screen we have a patent. We have absolutely never known of a case of the screen becoming so hot as to ignite the gas; in fact, we can make the absolute statement that if the screen is properly placed in the by-pass of an Elmore motor it will never backfire under any conditions of weak mixture, retarded spark, or any other known cause of backfiring.

Of course, every one has not had the experience we have had with two-cycle motors, and probably a lot of the errors which are communicated to the users through the papers are unavoidable, but it is a fact that a great many of the points that are brought up against the two-cycle motor are things that we have never experienced nor even heard of in the use of our cars; in fact, they appear absurd to us.

ELMORE MANUFACTURING COMPANY.

Clyde, O.

CREDIT BELONGS TO MR. CORREJA, OF ISELIN, N. J.

Editor THE AUTOMOBILE:

[533.]—Referring to your issue of December 20, permit me to state that M. J. J. Correja, Jr., of Iselin, N. J., is the man who will donate the land necessary for the continuance of Middlesex Road at Iselin, and not the writer, as stated in the item under the caption of "A Dangerous N. J. Railroad Crossing." It has been my pleasure and aim to put on foot this project, and Mr. Correja and myself now await such energetic and effective co-operation to accomplish this as it deserves. By continuing Middlesex road and causing the Pennsylvania Railroad Company to build a bridge, the worst piece of road between New York City and Philadelphia will be made up-to-date and safe.

A. D. HYDE.

Iselin, N. J.

AN AMERICAN VIEW OF THE FRENCH SALON

By C. W. KELSEY.

DO not think that we Americans know anything about what an automobile show should be, when we compare our American shows with that at the Palais. It is a magnificent spectacle, and was visited by people of all classes and all ranks of society. It is preëminently the great spectacular show of France, and takes preference over all other shows and expositions held there, and is a much more popular institution than are our American shows. Technically, while there were not so many changes from the standard type, as at previous shows, there were a number of interesting innovations. Among these was an exhaust valve with a camshaft so arranged that it could be advanced 80 per cent. This makes it possible to use the exhaust as a brake, relieving the compression in an emergency, and making a quick stop when necessary. This, taken all in all, is one of the most noteworthy new ideas seen at the show. It was regulated by a lever conveniently located at the dash, making it possible to advance the camshaft to any degree required.

Generally speaking, the foreigners are ahead of us in metal work, but on designing I think that we are at least a very close second, and that within a few years we shall closely approximate the best foreign ideas. I was surprised to see that practically no chrome nickel steel was used in the construction of this year's models. The front axles are generally made of high-grade iron; the Lemoyne, the popular axle, being built of that metal, and a number of other prominent makers following the same lead. There seems to be a strong tendency to use silico-manganese steel in gears. This compound makes a very hard metal and a very satisfactory one, but it is not easy to make, as there has heretofore been a great deal of trouble getting the mixture uniform. This has been overcome almost entirely by the best foreign workers.

In making castings the French are far ahead of us. The more general custom in America is to cast single cylinders. The French have outgrown this condition. They have reduced the possibility

of blowholes and other imperfections to a minimum, and therefore do not feel that they are taking any large percentage of chance in casting in pairs and even in sets of four and six. This system of multiple casting is used in most of the taximeter cabs, such as those turned out by the C. G. V., Clément, Renault and other companies. I noted that most all pressed steel work was hot pressed, making it possible to press out more intricate forms of frames and parts. In one booth I noted that even pistons were hot pressed from steel. Another tendency is to increase the general use of the shaft drive. Practically all the heavy cars and 'buses are now shaft-driven.

The use of the magneto is practically universal now. Foreign constructors seem to have settled on this, and to my mind this has been attained largely by the new Gionolli magneto, which, it is claimed, cannot be burned out. This is a big improvement in magnetos and is the only one which can be used successfully for a long time, so far as I have been able to discover, on six-cylinder machines. I was told at the show that the Stevens-Duryea people had ordered this magneto to be placed in their six-cylinder cars. I met Albert Champion, of Boston, at the show, and he stated that he was the American agent for this magneto.

Some American products were considerably in evidence. Among these was the Hyatt roller-bearing, which attracted a great deal of attention and had a large crowd continuously around its booth.

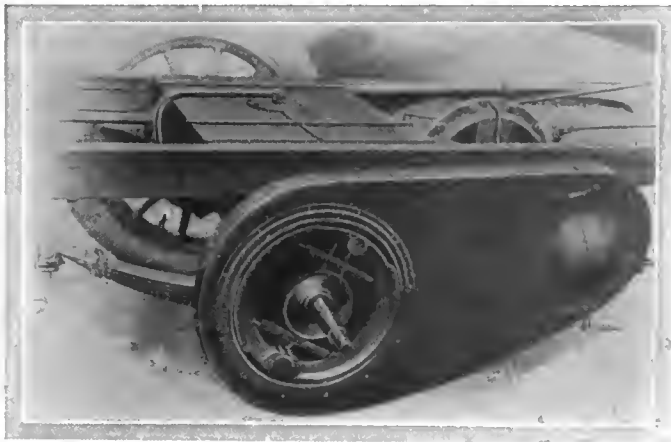
Splash lubrication with oil kept at a level by a pump is apparently the up-to-date thing abroad. I saw a great number of cars thus lubricated. Another little detail noted was that cotter-pins are almost obsolete. Lock-washers now take the place of cotter-pins. These are of special construction which does not destroy the thread or jam the bolt into the hole. In ball-bearings, the full type seems to be in favor instead of the silent type, and there is a very wide use of this kind of bearing. Offsets seem to have been generally discarded after trial by nearly all the big makers.



IN THE VICINITY OF THE GRAND PALAIS DURING THE SALON D'AUTOMOBILE, DECEMBER 7-23.

There is, of course, much interest here in the question of the six-cylinder car. In inspecting the show, I found that the six-cylinder fad was on the wane. Nearly all makers who had made six-cylinder cars were at first anxious to assert this fact, and of course there were a great number of them shown. But when I began to question the heads of concerns in their booths, I found that nearly all of them asserted that they had made the six-cylinders more for the purpose of keeping up with the procession and that they had decided not to make any large number of these cars in the future. They admitted the greater flexibility of the six-cylinder engine, but found that cost of up-keep and other deterring elements overcame the possible advantages of six-cylinder cars. I went pretty thoroughly into this subject and believe that I reflect the general feeling.

I paid a visit to the C. G. V. factory and was particularly impressed with the high quality of the workmanship there. The firm will turn out about 350 cars during the coming year. I rode in one of their 20-horsepower taximeter cabs, and found it a wonder. The car seemed to me to have at least 30 horsepower and ran perfectly with very little vibration. In this connection I want to speak of the brake construction noted at the C. G. V. factory and now generally in use in Europe. This is a steel band with cast-iron blocks running on a drum of either pressed steel



CHAIN CASE ON C. G. V. SHOWN AT SALON.

or malleable iron. Indeed, malleable iron seems to be very largely used in construction. A number of pistons are now being made of this metal.

One of the most interesting trips I took was to the Clément factory. I was much impressed with the success made by Clément during the years that he has been in the bicycle and automobile manufacture. He is one of the most remarkable men in the business. He started with nothing at all in the early bicycle days, and was so poor that he had to make one bicycle and sell it before he could make another. Later, when the Clément and Humber concerns were consolidated, Clément's rise began to be meteoric, and to-day he is represented in four big French concerns, the Clément-Bayard Company, the Clément-Talbert Company, the Clément-Gladiator Company, the Clément-Serpollet Company, and an Italian Clément company, and he is credited with being the largest stockholder in the Panhard company and its controlling factor. He is also said to be one of the largest stockholders in both the Michelin and Dunlop tire concerns, and it is asserted in Paris that he controls about half of the output of other cars in France.

Clément has a model factory for machines, and the treatment of visitors is most generous. They are placed in charge of guides and taken in parties continuously through the works, which are strictly modern in every way. The factory is very large and the raw material is taken in at one end and the finished product shipped from the other. The building is in the form of a hollow quadrangle, with a large square building erected inside. The space between the outer and inner buildings is roofed over and

serves as a roadway and testing place for the cars. Here, too, the quality of the workmanship was remarkable. I noted, for instance, that almost all the grinding of valves and other parts was done under water. Mr. Clément told me that he had already bought \$4,000,000 worth of American machinery and that he was at present awaiting the shipment of \$200,000 worth more. Incidentally, he is also looking for an American shop foreman, which seems to indicate that American skill and methods are not entirely despised in France.

All Americans are much interested in the taximeter cabs, and I was not an exception. I rode in them on every occasion possible, and was much impressed with the two-cylinder vertical motors which were used, which seemed to have a great deal of power and practically no vibration. I did not see a single cab broken down or delayed in any way while I was in Paris. The chauffeurs rent these cabs, completely furnished and equipped, by the month, and all of them that I talked with stated that their cabs had paid them well for the six months or thereabouts that they had been in use. There was, however, some question in the minds of most of the drivers whether the coming period of repairs would reduce the profits enough to make it a bad investment for them. This is a question which only the next year will settle. Nevertheless, there are about 2,000 more taximeter cabs ordered for use in Paris.

CALCUTTA TO HAVE MOTOR 'BUS SERVICE.

According to a report just received from Consul-General William H. Michael, a company known as Calcutta Motors, Ltd., has just been incorporated to conduct a general motor 'bus and freight service in that city. It is believed that it will succeed in time in driving out the bullock carts and wretched "ticcagarris" that have served in an unsatisfactory way the increasing passenger and freight traffic. A Calcutta paper says: "The development in motor conveyance for goods and passengers was sure to come. The capital of the Calcutta Motors, Ltd., is to be \$400,000. A start is to be made with ten omnibuses and ten lorries. If they could add a service of motor cars for hire by time or mileage they would confer a boon upon the community."

There are many cities in India that will make a similar change, which opens a good field for American manufacturers of motor vehicles. The sight-seeing motor car has not yet been introduced in India, and the demand for such cars should increase from year to year as the stream of visitors in the cold weather increases, as it has been doing for several years.

A SWEDISH IDEA FOR OIL MOTORS.

Consul R. S. S. Bergh sends the report from Gottenborg that J. Hesselman, a civil engineer in the employ of the gas motor manufacturing firm, Aktiebolaget Diesels Motorer, at Sjöklä, Sweden, has made an invention by which a gas motor can be reversed by a device within the motor itself, when kerosene or raw oil is used for motive power. It is remarked that if this invention is all it is claimed to be, it is very important, and will open a wide field for the use of such motors as marine engines, because they are so easy to handle compared with steam engines. A number of reversing gas engines have been experimented with in this country, but so far without practical success when put into actual service.

GLOBE-GIRDLER REACHES MEXICO CITY.

Charles J. Glidden, the Napier globe-girdler, last week arrived in Mexico City, though he had the misfortune to complete the conclusion of his journey in an ordinary railroad car. Fifty miles north of the Mexican capital his famous automobile jumped the track, and as a result was more or less wrecked, so badly, in fact, that Mr. Glidden found it necessary to ship it back to the factory in England, where it will be repaired and then sent to Port Said on the Suez Canal, where its owner and party will rejoin it later in the winter.

CHICAGO'S BIG SEVENTH SHOW.

More than 300 exhibitors of cars, accessories and sundries will hold forth during the week February 2-9, inclusive, at the Chicago Automobile Show, which is the seventh annual event of the kind. This makes it not alone the largest show that has ever graced the boards in the Windy City, but in the entire country, for, considered from the point of space occupied as well as number of exhibitors, there has never been anything approaching it in magnitude. The Coliseum and the First Regiment Armory will be impressed into service, the same as last year, and though the combined buildings provide 80,000 square feet of space, which is said to be fully 25 per cent. more than that used in any show held outside of Chicago, it has not been found sufficient to meet the demands of all who wish to exhibit.

There will be 102 separate exhibits of cars, something like 190 of accessories, and eight of motorcycles, beside which 10 applications for space from makers and something like 60 from accessory manufacturers have not been acted upon, owing to the fact that they were filed too late. Some of these will probably be accommodated, thus bringing the number over the 300 mark in the aggregate. A reduction of the amount of space allotted per exhibitor together with the fact that two additional balconies will be impressed into service this year is accountable for the increase in the number of exhibitors over last.

In accordance with what has come to be recognized as standard practise, the decorative scheme will be uniform and will be entirely in the hands of the management. Ivory, black and gold will form the dominating color motif, the carpeting being dark green set off by a red border. The center of the Coliseum will be transformed into an arched colonnade extending its entire length. The supports will be massive pillars of a cream tint surmounted by arches of staff springing from a point seven feet from the floor and rising to a height of eleven feet at their center. The arches, finished in old ivory, will, in addition, be flanked by automobile motifs; to the right a touring car; to the left a racing car at high speed, while the centerpiece of the arch will consist of a circular plaque with a wide gold border, the remainder being covered with scarlet plush. The design represents the upper half of a figure of Mercury grasping a steering wheel. The staff work was designed by Henry A. Thiede, of Chicago, while the plaque is the work of A. T. Merrick, of New York. Above the arches will be the exhibitors' signs.

In order to accommodate the additional number of accessory makers, an elevated platform has been built. The pillars of the building will be completely hidden by staffwork, and standing in front of them will be staff figures representing the chauffeur and chaffeuse, 12 of each being placed alternately. The pillars will also be used to bear the sign of the exhibitor. They will be backed with purple and run vertically. In order to secure as nearly as possible an uninterrupted view of the building as a whole, a low railing finished in gold and carrying a suitable curtain will constitute the only obstruction permitted.

The same general idea will be employed in the Annex and the Armory as well as the other departments, of which there will be six in all, except that the color scheme will be different in each case. Lighting effects have received the same painstaking attention and will be on an equally elaborate scale. The present gallery of the building will disappear in the elevated platform to be erected and from the edge of the latter will depend festoons of electric lights, while beneath and above the new gallery in suitable places will be ornamental clusters of staff of large size, each bearing eight opalescent globes.

Considered in the aggregate, the plan of decoration is the most elaborate ever undertaken in connection with an exhibition of this nature, so that the amount of labor and material its execution involves is of interest. To cover the floors 12,500 yards of carpet are required, while 120,000 square feet of material is necessary for the overhead decorations, and the building of the gallery calls for the laying of 20,000 feet of flooring. Add to this the amount of wall covering and the tons of plaster required for the staff work, and some idea of the magnitude of the undertaking may

be gained. To complicate the problem everything must be installed within 24 hours after the building comes into the possession of the show management. Consequently everything has to be in readiness to put in place, so that the work of preparing the decorations was begun two months in advance. One hundred men have been employed constantly for that period and 300 will be necessary to install the decorations. To accommodate the completed material during the interim, four stores, a loft and a basement were needed. The total cost of the work is estimated in the neighborhood of \$30,000, but this represents a saving to the industry as a whole of something like \$50,000, as under the old method every firm had to send men in advance to contract for signs, decorations and furniture, whereas now the exhibitor is called upon to do nothing more than put his cars in place.

The benefit to be derived by Chicago from the holding of such a show is also an item of interest. It is estimated that the exhibitors and their employees will number at least 2,000, while visiting dealers will account for a like number. How many prospective purchasers will visit Chicago from the surrounding country solely for the purpose of attending the show is a question that it is impossible to answer definitely, but it is thought 20,000 is not an excessive estimate. For instance, Denver, Col., will send a special delegation of dealers in three sleepers; Canadian dealers are expected to be on hand in force, and the chief dealer of Havana, Cuba, will send a representative, showing that interest is not confined to local firms by any means.

PITTSBURG TO HAVE AN APRIL SHOW.

PITTSBURG, PA., Jan. 7.—The Automobile Dealers' Association of Pittsburg is at work even now on its April 7-13 show, and the representative of every car sold in the city except one is involved in the enterprise. Herewith are the fifteen concerns which compose the association: Standard Automobile Company, Bankers Bros., Atlas Automobile Company, Fort Pitt Automobile Company, East Liberty Automobile Company, Hiland Automobile Company, Keystone Automobile Company, Winton Motor Carriage Company, Allegheny Automobile Company, Auto Repair Company, Central Automobile Company, James Motor Company, Wilkinsburg Auto Garage Company, Liberty Automobile Company, Colonial Automobile Company.

Almost every American manufacturer of prominence, whose cars have sufficient power for hilly country, is at present represented in Pittsburg—there being 56 makes, comprising over 100 models. Owing to hilly country and bad roads, automobiles, to give satisfaction in and around Pittsburg, are required to have more power, have better brakes and be better constructed than those sent into any other large city in the United States. The Pittsburg dealers realize this; hence nothing but reliable, powerful cars are handled here. At the present time there are more high-priced, high-powered cars in Pittsburg in proportion to the population than anywhere else in the United States.

The Duquesne Garden is specially adapted for holding an automobile show, the entire space being on one floor, without the view being obstructed by any pillars or partitions. Within a circle of 75 miles of Duquesne Garden there is more of a population than any similar circle drawn about any city in the United States, excepting New York and Chicago. This district, drawing from West Virginia, eastern Ohio and western Pennsylvania, is, as far as mills, mines, etc., are concerned, the most prosperous in the United States. The workmen, as a whole, receive larger wages and steadier employment than any other locality in the United States, and there is more money paid in wages in this field than any other space of the same size in the world. It is estimated that there will be \$3,000,000 expended for new automobiles in the Pittsburg district in 1907.

This is Pittsburg's first automobile show, and will cost the dealers in the neighborhood of \$50,000. The show committee, which is composed of W. H. LaFountain, Earl Kiser, Thos. I. Cochran and W. N. Murray, state that the whole of the automobile space has been sold and nearly all of the sundry spaces.

THE FARMER AND THE AUTO, TO-DAY

BY A. R. PARDINGTON, SECOND VICE-PRESIDENT LONG ISLAND MOTOR PARKWAY, INC.

BUT what of the farmer in this new era, the age of automobiles, this period of rapid transportation? Did anyone ever hear of the farmer—our one class of nobility—being left by the roadside? Never. For years now we have heard of bankers, insurance magnates, railroad investors, lawyers, and numerous other classes as being addicted to the use of the automobile. Due to the narrow-mindedness of a few, the farmer has been presented in the light of an obstructionist, an opponent of good roads, and as one who gloried in blocking the wheels of progress as exemplified by the automobile. But his attitude had some reason.

Why the Farmer Was Prejudiced at the Outset.

The early antagonism of the farmer was influenced by a very small number of the extremely thoughtless, very rich, who burned up the highways, left a trail of dead domestic animals and fowls, and the "women folks" all aquiver with their last hairbreadth escape. These very few thoughtless automobilists had been accustomed to autoing abroad, where the rural population had been through years of just such experiences, and where draft and pleasure beasts had long since become accustomed to the strange sounds and weird sights. Popular sentiment against the automobile and the automobilist was quickly aroused, and, judging from the press reports which were read daily, was soon at fever heat. Other automobilists came, driving other cars. They were of a different class, showing consideration for other users of the highway—even going so far as to stop their motors and assist the farmer to drive his beast, by leading, and by a kindly word spoken. Others, who had driven high-spirited horses—realizing the effect of the human voice—spoke to the animals as they slowly passed. There were still others, and to them belongs much credit for the quick eradication of the adverse sentiment. These, when they came up with a horse which displayed fear, stopped and urged the driver to then and there educate the horse to the presence of the automobile.

Good Work Done by the Thoughtful Autoist.

To the really fine work done by this class of autoists is due the real credit for the generally cordial relations which now exist between the non-autoing farmer and the autoist. To this class also belongs much credit for the increasing number of cars owned and operated by farmers. At these words, I hear an audible smile from some of my readers. If you do smile, and are inclined to doubt the truth of my statement, I say that I can tell you where you do not live. You do not live on Long Island, nor in certain parts of New Jersey, nor in a section of Massachusetts, nor even in good old Indiana, for the automobile-owning farmer is no rarity there, nor is he in thousands of sections of the country, where enlightenment prevails or where proper conditions obtain.

The schooling of the farmer has been rapid, but thorough. He is not likely to unlearn anything that he has learned. He has taken to the automobile with the same avidity as to the telephone. The telephone helped him to lift himself by his boot straps out of his seclusion and retirement. It broadened his view of life. It enriched his pocket. He made his sales at the high peak, and his purchases on the down sweep of the curve. He learned the weather reports before his city neighbor did. He set his watch each day on a signal from the naval observatory at Washington. He followed the progress of the world of events and was independent. Then came the automobile. His first acquaintance with it was disastrous. He watched it fly down the road, followed by a cloud of dust, and from the wreckage he dug up his pet dog—dead. He sought further and found a blooded "Rock" or "Cochin"—also dead. The cloud of dust that followed the automobile was followed by a flow of "langwidge" and of such character that its repetition would blast. Later there came

another automobile, going much slower and blowing no horns. This time our farmer friend and his wife were about to drive on to the highway, on the way to "town." The horses were quickly reined in, and the ears of the good wife were shocked at the expletive which escaped our friend's lips. Slower and slower came the automobile until it stopped short of the driveway. Its driver beckoned to the farmer to proceed, but was met by a shake of the head and "some few words." The motor is stopped, and its driver leaves the car and salutes our friend in an easy manner, with the result that an hour is lost, but a firm exponent of the automobile is found. The horse has been educated. He has even put his nose into the tonneau and forgets to scare when the car moves. There are two other horses in the barn, which are also educated. There is a converted farmer, but a doubting housewife. A ride to "village," only two miles away, and a speedy return, completes her conversion, and there you are. The result? That farmer owns a good second-hand car in which he does his "errands." His wife is taken to the sewing circle or the Ladies' Aid, and how the tongues do buzz. She hears discredit, sarcasm, unbelief, and gossip. She replies by inviting her neighbor to ride home with her when the husband comes. Another convert and another car. The first link in the chain was forged only three years ago. Already it extends half way across the Continent.

Autoing Agriculturist Is an Accomplished Fact.

An isolated case, you say? By no means; on Long Island, where I live, it is common, and is becoming more common day by day. A short time ago this conversation was overheard on a Long Island Railroad train. The writer had been in attendance upon the annual Farmers' "Institute," and was returning to the city. Seated across the aisle was a well-known Long Island farmer, one of the up-to-date kind, a representative citizen. One of those who had attended the institute entered and dropped into the seat alongside of the delegate. "Well, Charley, did your folks go into the city this winter?" "No, we stayed on the farm. We bought an automobile, and the winter has been so open that we have used it a lot." From this point the conversation lost interest, but it proved the fact that the farmer is taking to automobiles. One farmer, living in Nassau county, Long Island, who two years ago fought the proposition to hold the first race for the William K. Vanderbilt, Jr., cup on the county highways, now owns an automobile, his son owns one, and together they secured signatures to a petition to have the event held on those roads for the third time. In his arguments with his neighbors he tells them that within ten years they will be hauling their produce to market in motor trucks.

Yes, the farmer is taking to the automobile, and justly so. It has enhanced the value of his acreage; it has annihilated distances, and made every resident of his county his neighbor; it has made his farm a suburban holding and has put him into the closest possible touch with the outside world.

Commercial Importance of the Farmers' Support.

Out in Indiana, one automobile concern has a salesman, whose sole duty is to interest the farmer. Sales are an every-day occurrence, each one stimulating others. In Minnesota, due to the phenomenally successful season of 1905, hundreds of farmers, who already owned pianos, are now buying automobiles. On Long Island the automobile-owning farmer has come to be a factor to be reckoned with, particularly when good roads are opposed by the non-progressive class, who are "agin" everything that makes for the betterment of general conditions.

The logical sequence of this move on the part of the farmer will undoubtedly be the motor plow, harvester, thresher, pump, corn sheller, and in time the independent electric light installation for the house and the barn.

CLUBS BUSY OUTLINING SEASON'S WORK

Lack of Discrimination by Oakland's Police.

OAKLAND, CAL., Jan. 3.—Local automobilists, and those of San Francisco as well, are much interested in the outcome of the protest which has been filed by the Automobile Club of California with the city authorities against the abuse of official power by its police officers. L. P. Lowe, chairman of the club's executive committee, has addressed an official letter to the mayor of the city, asking that the matter be taken under advisement with a view of remedying the annoyances to which law-observing automobilists are subjected. From complaints received at club headquarters it appears that no distinction is made between drivers who are trying to observe the law and drivers who are running at all rates of speed, and practically every one has been stopped and detained at the pleasure of over-zealous officers, to the great annoyance of the feminine members of touring parties especially.

In his letter to the mayor, Mr. Lowe tersely expresses the autoists' side of the matter as follows: "As against arrests of the wilful transgressors, officers should be instructed to consider both time and place and not make arrests for mere technical violations of a speed law, as if highway users, driving no matter what kind of a vehicle, be timed over a measured distance, it is safe to say that the very great majority of them will be found to be exceeding the legal rate of speed. This is pronouncedly so in the cases of electric cars, and noticeably so with milk and bread wagons, express teams, baggage wagons, delivery wagons, etc., which must necessarily be driven with rapidity if their business is to be attended to in the time limit at their command. While drivers of automobiles are certainly amenable to the law, it must be borne in mind that so also are all other highway users, and automobiles should not, therefore, as a class, necessarily be selected for prosecution or persecution. They might, in justice to themselves, retaliate by causing the arrest of all classes of technical violators of speed laws, but if this were done the courts would be so overcrowded that these cases alone could not be heard for very lack of time. Automobilists, however, have no desire to protect themselves by such extreme and unfriendly measures, and merely ask that they be afforded fair and liberal treatment, which, I am sure, you personally feel is their due."

Preparations for New Jersey Endurance Run.

NEWARK, N. J., Jan. 7.—As it has been definitely decided that the New Jersey Automobile and Motor Club will hold a 500-mile endurance run in the spring, the club officials are gathering such advance information and statistics of other contests as will enable them to formulate conditions and rules for the government of the run that will give every competitive car an equal chance in its class. Secretary H. A. Bonnell has been gathering a volume of necessary data for the use of the committee which will prove of great value in its deliberations. The committee realizes that for the contest to be a success its rules must be stringent enough to provide that the cars not only cover the distance without need of repairs, but also cover it within a certain fixed time. The cars will, in all probability, not be required to appear at the checking stations exactly upon a certain minute, as was the case in the Glidden tour, but will be allowed some slight leeway. Most of the dealers who would enter and who, as club members, have been consulted upon the matter, have expressed the opinion that to allow a half hour deviation from the time set would be fair to all the contestants. Under this plan all the contestants would have to appear to be checked in not later than schedule time, but would be allowed to appear at the stations 30 minutes in advance of schedule time if they preferred. If the cars checked in either earlier or later than within this half-hour period they would be penalized according to the magnitude of the offense. Observers are now being chosen for the run.

St. Louis, October 19, for the Balloon Race.

October 19 is the probable date and St. Louis will be the place for the start of the International Cup balloon race. President Cortlandt Field Bishop, Alan R. Hawley, J. C. McCoy, Augustus Post, and Leo Stevens were the members of the Aero Club of America who investigated the advantages in St. Louis and reported favorably to the board of directors, which has unanimously decided in favor of the Missouri metropolis. In the announcement by President Bishop the following is contained:

"As has been previously intimated, St. Louis is, from a geographical point of view, exceptionally located, being far removed from the sea in all directions. The city authorities have set apart for the starting point a portion of Forest Park. This place can be inclosed in such a way that there will be no interference with the inflation of the balloons, and the supply of gas will be sufficient for quickly inflating any number of balloons.

The club proposes to hold the contest during the period of full moon in the month of October—probably on October 19. According to the information obtained by the weather bureau during a long period of observations with kites and pilot balloons, the usual wind prevailing at that season of the year in the upper altitudes proceeds in an easterly direction towards New York, avoiding the Great Lakes, going to the south of them. Fine weather is invariably to be expected, there being usually but three or four days of rain in the month of October. It will be recalled that the greatest known balloon flight ever made in the United States was made from St. Louis by John Wise in 1859. He landed in Jefferson county, New York State.

"The Aero Club of America is enabled to announce that gas will be furnished free of cost to all contestants for the International Aeronautic Cup. Special rates will be secured at the hotels, and if a sufficient number of members of the clubs belonging to the International Federation attend, it will be possible to secure a special rate of fare from New York to St. Louis and return.

"Besides the prizes annually offered in the International Aeronautic Cup contest, various organizations of St. Louis will offer supplementary prizes for second, third and fourth places, amounting altogether to about 5,000 francs. For those wishing to make trial flights in preparation for the International Cup contest, or for those wishing to compete for the "Lahm Cup," which will be offered for competition by the Aero Club of America, after March 1, 1907, arrangements have been made to supply gas at a specially reduced rate. This applies only to pilots recommended by the Aero Club of America. The rules of competition for the Lahm Cup will be announced later. Contestants will be afforded every facility by the gas company at St. Louis.

"You are reminded that under the conditions, entries for the 1907 contest for the International Aeronautic Cup close on February 1, 1907."

Ohio State Automobile Association Meets in February.

CLEVELAND, O., Jan. 7.—A meeting of the Ohio State Automobile Association will undoubtedly be held here during the auto show week in February. It is proposed to organize a movement which will extend over the entire State, for the betterment of road conditions. Automobile clubs are being organized in all the leading centers, and the doctrine of good roads will be disseminated thoroughly during the next few months by the organizations that are already established and have a sound and stable footing. The recently reorganized club at Akron has been incorporated, and the automobilists of Elyria are preparing to form a local organization. A Cleveland man may be elected secretary of the State organization at its meeting, and if this is done Cleveland will become the center of the movement for the Buckeye State. Already the farmers' journals of Ohio are advocating improved highways, and their support, it is believed, can be

counted upon for any reasonable system of road building that may be submitted to the next Legislature.

Plans for the sample of modern highway which will be built by the Cleveland Automobile Club between Euclid and the Lake county line, in the direction of Painesville, indicate that nothing in the nature of brick paving will be considered. Secretary Goddard is authority for the statement that the road will be built of macadam or something as good. The plans include a foundation which may be used in the future as a basis for paving if desired.

President Cobe Advocates More Liberal Auto Law.

CHICAGO, Jan. 7.—President Ira M. Cobe, of the Chicago Automobile Club, states that the present year promises to be one of great importance to the automobilists of Illinois, because State regulation through the medium of legislative enactment is practically certain to come. Last year a bill that was satisfactory to autoists passed both legislative houses, but was vetoed by the Governor. A strenuous attempt will be made this year by the Chicago Automobile Club to secure the passage of a similar act, with such changes as will meet the objections raised by the Governor to the former bill.

Standing Committees of the Long Island Automobile Club.

BROOKLYN, N. Y., Jan. 7.—Standing committees of the Long Island Automobile Club were announced at the last meeting of the club, the chairmen for which are as follows: Law and legislation, Col. James D. Bell; technical, Louis T. Weiss; good roads, A. R. Pardington; runs and tours, Charles Jerome Edwards; garage, A. C. Howe; entertainment, Edwin Melvin; membership, C. H. Galt; finance, Alfred Wilmarth. The first of the new year's exhibition nights takes place Friday, January 25, when talks will be given on the Ford, Thomas, and Stevens-Duryea cars.

Elsie Janis Joins the Worcester Club.

WORCESTER, MASS., Jan. 7.—The board of governors of the Worcester Automobile Club last week made Elsie Janis, the youthful star of "The Vanderbilt Cup," an honorary member of the club, after tendering her a reception and banquet.

CLUB DOINGS IN GENERAL.

PHILADELPHIA.—The first general meeting of the Quaker City Motor Club since its incorporation will be held at its quarters in the Hotel Majestic, February 7. At this meeting permanent officers will be elected.

AKRON, O.—The Akron Automobile Club has been incorporated by F. W. Work, S. G. Rogers, Fred C. Wood, A. H. Marks, and N. O. Mather, all prominent automobilists of this city. At the next meeting of the club permanent officers will be elected.

GUADALAJARA, MEX.—Governor Miguel Ahumada, of the province of Jalisco, has been invited as the guest of honor to the banquet of the Automobile Club of Guadalajara, which will be held the latter part of this month, in the Cedral park, at the Escoba cotton factory.

BUFFALO.—A large delegation of members of the Automobile Club of Buffalo will take advantage of the special transportation rates granted the club to visit the Madison Square Garden automobile show next week. Secretary Lewis is making the necessary arrangements for special accommodations.

CHICAGO.—At the annual meeting of the Chicago Motorcycle Club the following officers were elected for the ensuing year: President, S. W. Fahrney; vice-president, Grant W. Hunter; recording secretary, C. H. Lamb; financial secretary, C. W. Van Sickle; treasurer, E. W. Keller; captain, W. L. Johnson.

THE AUTOMOBILE CALENDAR AMERICAN.

Shows.

- Jan. 12-19.....—Annual Automobile Show of the Association of Licensed Automobile Manufacturers, Madison Square Garden, New York City.
- Jan. 19-26.....—Baltimore (Md.) Automobile Show of the Automobile Club of Maryland and Dealers' Association.
- Jan. 21-23.....—Los Angeles, Cal., Morley's Rink, First Automobile Show of the Automobile Dealers' Association of Southern California.
- Jan. 28-Feb. 2.....—Washington (D. C.) Automobile Show, Dupont Garage, Washington Automobile Dealers' Association.
- Feb. 2-9.....—Chicago Automobile Show, Coliseum and First Regiment Armory. S. A. Miles, manager, 7 E. 42d Street, New York City.
- Feb. 11-16.....—Detroit, Mich., Sixth Annual Automobile Show, Light Guard Armory, Tri-State Automobile and Sporting Goods Association. E. E. Mc Masters, manager.
- Feb. 18-23.....—Fifth Annual Automobile Show, Buffalo, Convention Hall. D. H. Lewis, manager, Teck Building.
- Feb. 25-Mar. 2.....—Portland, Me., Second Annual Automobile and Power Boat Show, The Auditorium.
- March 2-9.....—Chicago, Second Annual Power Boat Show, Seventh Regiment Armory. W. C. Andrews, manager, 19 E. Huron street.
- March 4-10.....—Kansas City, Mo., First Annual Automobile Show, Convention Hall. Frank L. Woodward, manager, Willis Wood Theatre Building.
- March 18-23.....—Providence (R. I.) Automobile and Power Boat Show, Infantry Hall. F. M. Prescott, manager.
- April 6-13.....—Montreal, Canada, Second International Automobile and Sportsman's Exhibition. R. M. Jaffray, manager, 309 W. Notre Dame street.
- April 8-13.....—Pittsburg, Pa., First Annual Show of the Pittsburg Automobile Dealers' Association, Duquesne Garden.

Race Meets, Hill Climbs, etc.

- Jan. 22-26.....—Ormond-Daytona (Florida) International Race Meet, Florida East Coast Automobile Association.

Motor Boat Races.

- Jan. 29-Feb. 1.....—Palm Beach, Fla., Annual Races of the Palm Beach Power Boat Association.
- June 8.....—670-Mile Ocean Motor Boat Race, New York to Bermuda. Motor Boat Club of America and Royal Bermuda Yacht Club.
- Sept. 2-6.....—Jamestown (Va.) Exposition, Motor Boat Races.

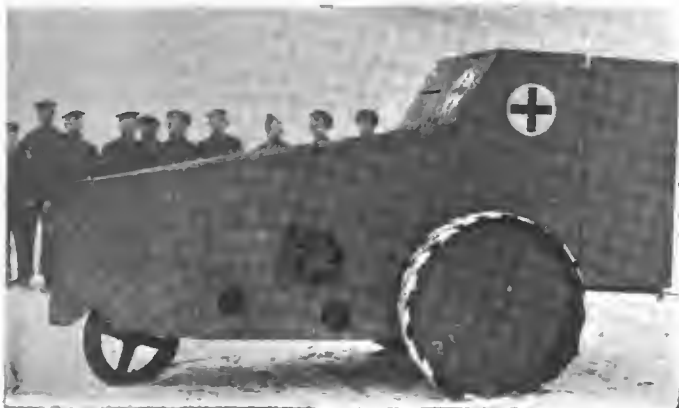
FOREIGN.

Shows.

- Jan. 5-12.....—Dublin Motor Show, Irish Automobile Club.
- Jan. 18-26.....—Birmingham (Eng.) Automobile Show.
- Jan. 25-Feb. 2.....—Liverpool Motor Show, Tournament Hall.
- Feb. 1-9.....—London, Crystal Palace Motor Show.
- Feb. 16.....—Automobile Exhibition at Turin, Italy.
- March 7-16.....—London, Olympia Commercial Vehicle and Motor Boat Show.
- April 6-13.....—London, Agricultural Hall Motor Show.
- May 1-15.....—Madrid, Spain, Automobile Exhibition, Palace of Fine Arts, Royal Automobile Club of Madrid.
- May 15-26.....—Third Annual Swiss Automobile and Cycle Show, Zurich.

Race Meets, Hill Climbs, etc.

- Feb. 23-27.....—Voiturette Contest, Automobile Club of Italy.
- March 20-27.....—Nice (France) Automobile Week.
- April 1-15.....—Spring Wheel Competition.
- April 21.....—Targa Florio Tour (Sicily), Auto Club of Milan.
- April 25-28.....—Touring Contest, Automobile Club of Touraine.
- April 28.....—Chateau Thierry Hill Climb.
- May 1-15.....—Paris-Madrid Touring Competition.
- May 29-June 1.....—Irish Automobile Club Reliability Trials.
- June 3-12.....—Herkomer Cup, Automobile Club of Bavaria.
- June 14.....—German Emperor's Cup, Taunus Circuit, Imperial Automobile Club.
- June 24-29.....—Scottish Reliability Trial, Scottish Automobile Club.
- Aug. 11-20.....—Coupe d'Auvergues, France.



RECENT TYPE OF ENGLISH ARMORED CAR.



GERMAN WAR AUTO SHOWN AT BERLIN.

AUTOS FOR THE SWORD AND PLOUGHSHARE.

During the past two years automobile shows abroad have held a potent attraction for that portion of the public that merely comes to look and wonder, to whom all ordinary automobiles look pretty much alike, and to whom an object of more than passing interest must possess unusual and bizarre features. These have been supplied by the exhibition of armored cars at the recent Berlin Show and Paris Salon, and by the agricultural implements designed to be operated by gasoline motors that have become a feature of the annual display at Olympia in London.

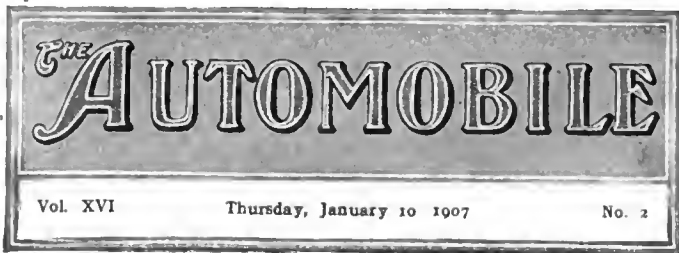
Anyone who has watched the rapid flight of an ordinary touring car over a dusty country road can picture to himself what that might be converted into were the car one of the armored vehicles that forms the *piece de resistance* of some of the maker's stands. Instead of the peaceful carload of autoists intent upon nothing more serious than breaking the local speed regulations, one of these oddly-shaped vehicles would come rushing along with no visible sign of human control or guiding hand steering it on its course. The all-enveloping cloud of dust would be supplemented by the smoke from the rapid discharges of the quick-firing rifle

mounted in the turret-like hood over the rear of the car, and this, combined with the flashes of flame shooting from the surrounding haze that marked the swift progress of the vehicle, would make the sight of one of these cars in action something long to be remembered. To come back to them, peacefully standing inert at the maker's booth, they are objects of curiosity that lead the interested visitor to poke his head into the driver's compartment and the turret, feel the armor, mentally calculating its thickness and ability to withstand projectiles and the like.

The agricultural development of the automobile motor, on the other hand, introduces a flavor of the county fair to the show. The presence of plows, harrows and reapers, though they are merely auxiliary to the motor vehicle that is to drag them in operation, is more suggestive of the local aggregation of prize-winning pumpkins and swine than it is of high-priced automobiles. But not alone their novelty and the seeming inappropriateness of their surroundings serve to make these agricultural automobiles of absorbing interest, but likewise the excellent records they have made in actual service during the past two years. They have demonstrated that they are the equal of a far greater number of horses than could be employed economically.



MOTOR-DRIVEN PLOW THAT HAS BEEN SUCCESSFULLY INTRODUCED IN GREAT BRITAIN.



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The Seventh Madison Square Garden Show. Though second in time of occurrence so far as the present show season is concerned, the exhibition of cars that will be thrown open to the public next Saturday night is first in importance for a number of reasons.

Foremost among these is the fact that, with but a very few exceptions, the ranks of the exhibitors are made up of men who have been identified with the industry in this country since its very inception. They are those who have borne the brunt of the long period of the earliest stages of development of the automobile on this side of the Atlantic—a period when the business of automobile building was in a chaotic state, when experience came high and the rewards were meager. Success was largely a comparative term, for the successful car of one year gave way to something different before the end of that same twelvemonth, the frequent necessity for totally abandoning what had only been developed after a great deal of thought, labor and expense being but one of the numerous disappointments with which these pioneers had to contend during their long term of apprenticeship.

The cars that will be staged in Madison Square Garden during the coming week are the successors of many generations of American machines that have gone before, and as such they may well be said to represent most closely the trend of American thought in automobile design and building. A composite of the aggregate can doubtless be taken as the standard American automobile, in that such a car would be truly representative of the most advanced design recognized in this country, as well as embodying the best materials procurable anywhere. Whether taken singly, or as a whole, they stand second to none in any

of the qualities that go toward making the perfect automobile, insofar as that qualification may be applied to anything human, and, more particularly, they not alone compare favorably, but can now hold their own with the finest productions from abroad.

If France levied an import duty equal to that in force here, an American car would cost as much in Paris as a French one does in New York—a fact that may be readily confirmed by noting the prices at which the French productions are sold in England. As there will be a representative exhibit of imported cars at the Garden, the show will afford an opportunity for comparison and will demonstrate that the American car is second to none.



Nevertheless, High-powered Runabouts Will Sell.

When a man gets into the habit of dwelling upon a subject that he dislikes, his aversion to it grows unconsciously; sooner or later it develops into a settled prejudice, and the latter is stimulated merely by thinking of it; his jaundiced eye can see nothing but the objectionable traits in everything it regards, and in the end he becomes wholly dominated by his dislike—by an idea. Generally speaking, his type of self-propagated and self-nurtured dislike is the result of neither fact nor reason; it is the outcome of what may best be termed mental strabismus, and the prejudiced critic who has thus set himself apart, on a pedestal as it were, finds it impossible to view things as do others.

Automobile racing has been the *bête noir* of the publisher of the *Horseless Age* ever since the inception of the sport. He has inveighed against it from afar and decried it at close range; he has called the gods to witness its utter folly and absolute inanity on every occasion, and every accident or fatality attendant upon an event of the kind has been made the subject of a voluminous “I told you so.” He cannot see any possible way in which the industry can be benefited by it; on the contrary, every racing event held is but one more setback. Racing is doing positive harm to the automobile builder and his interests, from whatever point they may be regarded. Consequently, everything pertaining to racing comes under the ban of his exceeding disapproval, and the latest to be placed in this category is the high-powered runabout. Its very appearance is suggestive of nothing but racing, and its high power makes it fit for nothing else whatever, are his conclusions. Hence, should it be banished forthwith.

In the same issue it is mentioned, in the course of an editorial, that “the easiest riding position upon a car is as nearly as possible half way between the rear and front axles.” Yet the fact that that is exactly where the seats of the high-powered runabout are placed, and that possibly comfort may be one of the *raison d’être* of that type of car, never seems to have dawned upon the authority in question. That there are autoists galore who prefer not to be compelled to travel about with several hundred pounds of empty tonneau capable of accommodating four or five passengers, is another fact that seems to have escaped him. There are others besides, but the fact that the runabout looks racy overshadows them. What else can it be but a racing demon—?



Captious Criticism That Misses the Mark.

The *Engineering Record*, in a recent two-column leading editorial, discourses on “The Automobile for Engineering Purposes,” and in the article mingles touring car, motor truck and poor roads in a rather interesting manner. After condemning the upholstery of the touring car and criticising its lack of baggage space, the writer concludes that “a bad dirt road is not the place for the present standard low-powered truck.” We think a bad road is not a good place for a horse or a mule, and not even good for walking. As to “standard low-powered trucks,” our engineering friend should recall that motor trucks are not possibly of standard equipment, but must be constructed for the special service required and all engineering necessities complied with at the same time. When this is done, the automobile will show a marked economy over horse-drawn vehicles of any kind.

ASA GODDARD'S RESULTFUL OHIO ACTIVITY.

CLEVELAND, O., Jan. 7.—The Cleveland Club is making every effort to awaken new interest in automobile matters throughout the State, and it is doing this by assisting in the formation of automobile clubs and the rejuvenation of those which have become inactive. Last week Secretary Asa Goddard went to Akron and assisted in the reorganization of the club in that city, and this week Mr. Goddard went to Elyria, where a promising club is in course of organization. The aim is to form a circuit of good, live local organizations throughout the State, so that the Ohio State Automobile Association may amount to something in the advancement of the cause of good roads, and be in a position to effectively resist the enactment of unjust laws discriminating against automobiles.

While the social features of the local organizations are talked of to a great extent, the primary idea of the local club is to place the automobilists of the State in a position to put up a strong front by the time of the next legislature, so that a suitable appropriation may be secured for good roads work and a State good roads commission, similar to those in authority in eastern States, brought about. Another piece of legislation which the Cleveland automobilists have in mind is securing better regulations relative to the registration of automobiles. As the statutes now stand, an automobile party going from one State to another, and even traveling in this State exclusively, is subjected to a great number of annoyances. Licenses issued in one State are not recognized in another State. It is hoped that a universal recognition of licenses can be obtained in Ohio, as has been done in some other States.

Secretary Goddard is being boomed for the secretaryship of the Ohio State association. Mr. Goddard has a national reputation as an automobile worker, and he has accomplished a lot of good since he assumed his present duties in Cleveland. This city will doubtless be selected as the headquarters of the State organization this year, so that Mr. Goddard could easily combine the duties of both offices.

A. C. OF SYRACUSE NOMINATES OFFICERS.

SYRACUSE, N. Y., Jan. 7.—Hurlburt W. Smith has been selected for the office of president of the Automobile Club of Syracuse by the nominating committee, and as his associates the following have been nominated for the official roster: First vice-president, Christopher C. Bradley, Jr.; second vice-president, Harry C. Pierce; secretary and treasurer, Forman Wilkinson. The retiring president, Willet H. Brown, succeeded the club's first president, T. D. Wilkin, upon the death of the latter, and has held the office ever since. It is expected the nominations will receive the unanimous consent of the annual meeting of the club to be held shortly, and at which a buffet lunch will be served and social plans perfected for the balance of the winter season.

Plans are being made for the annual banquet of the club in February, when several speakers prominent in the automobile world will be present. A busy year is expected in club matters, and it is hoped to increase the membership from its present number of 150 to over 200. Fifty members were admitted during the past year. Good roads will still be the war cry of the club for next season, and the good work of placing signboards along the roads, so well begun last year, will be continued.

TRYING OUT THE GALVESTON BEACH.

During the recent visit of "The Vanderbilt Cup" Company No. 2 to Galveston, Tex., Eddie "Cannon" Bald, driver of the 90-horsepower Pope-Toledo racer, and A. E. Webb, the pilot of the 110-horsepower Premier, tried out the beach course whereon Col. E. H. R. Green made a Pope-Toledo mile in 56 seconds a couple of years ago. Bald sent his Pope-Toledo a mile in 52 seconds. Webb was detained, and his Premier was entrusted to R. Reynolds, whose unfamiliarity with it prevented a fast mile.

BRIDGING FOR THE NEXT A. A. A. TOUR.

One of the difficulties encountered on the run from Hagerstown, Md., to Staunton, Va., while a path was being sought by Augustus Post for a possible route for next year's A. A. A. tour, was the necessity of fording the Opegnon river between Berryville and Winchester, Va. In order to remove this obstacle and make the route more attractive, and so influence the A. A. A. to run next year's Glidden Tour to the Jamestown Exposition at Norfolk, Virginians have striven to prevail upon the Turnpike company to build a bridge over this stream. The company is composed of anti-automobilists of the rankest type and flatly refused any encouragement whatever. Its attitude changed when it was brought out that its original charter compelled it to "bridge all streams," and, since it had evaded the stipulations of the charter for many years, the local men made it pretty warm for the company. A contract has now been let for a \$4,000 bridge, and the contractor is under bond to have it ready and open for travel by May 15, 1907. The ground is now broken and the work under way; the structure is to be of steel with concrete supports and approaches. All this shows how the advancing army of automobilists forces betterment in local conditions.

PROGRESS ON LONG ISLAND PARKWAY.

With President W. K. Vanderbilt, Jr., of the Long Island Motor Parkway in Europe, the greater part of the work in the construction of this much-wanted and much-talked-of automobile road has devolved upon General Manager A. R. Pardington and Treasurer Jefferson deMont Thompson. These two are more than busy, and recently had a satisfactory meeting with the local board of trade of Riverhead, Long Island. A substantial grant of land will probably follow from the Riverhead end of the route. Rights of way are gradually being obtained and generous additions to the subscription list are coming to hand. While it will require some extraordinary efforts to get the parkway finished in time for the Vanderbilt Cup race of next fall, the directors are confident that there will be no difficulty in being ready. The completion of the Long Island parkway will mean the beginning of other similar roadways, several of which have been mentioned in print. For the present, however, all possible effort will be concentrated upon the Long Island road, the success of which is assured beyond question.

OFFICERS FOR THE A. C. OF WASHINGTON.

WASHINGTON, D. C., Jan. 7.—The Automobile Club of Washington has elected the following officers for the ensuing year: President, Robert B. Caverly; vice-president, Col. C. E. Wood; secretary, Leroy Mark; treasurer, O. J. De Moll; captain, Frank H. Edmonds; lieutenant, C. Royce Hough. In retiring from the office of president, W. S. Duvall thanked the club for the support it had given him during the first year's existence of the club, which had enabled him to bring it up to a high standing.

In assuming the office, President Caverly said it would be his object during his incumbency to make the club a greater power than ever in the automobile affairs of Washington. Messrs. Wood, Mark and DeMoll were reelected, while Mr. Edmonds was promoted from lieutenant to captain. The latter has promised to devise a series of interesting tours for the club during the summer. An oyster roast was given by the club on New Year's day to members and invited guests.

OLDFIELD TO RACE IN CALIFORNIA.

Barney Oldfield has decided upon California as the scene of his exhibition track races, and he is on his way westward, this time under the management of Ernest Moross, who has again succeeded W. H. Pickens in a managerial capacity. Recently the latter issued a statement to the effect that he was no longer looking after Oldfield's tour. The energetic Pickens now has Eddy Bald and A. C. Webb for his champion-speed pair.

QUAKER CITY SHOW WINS OVER HANDICAPS

PHILADELPHIA, Jan. 9.—At 8 o'clock Saturday night last the annual show of the Philadelphia Automobile Trade Association, in the First Regiment Armory, was opened by Mayor Weaver, who touched the button that flooded the building with the light from a myriad of electric lamps, strung from the roof and scattered here and there through the foliage of trellised arbors which extend the length of the main hall. An unofficial



GENERAL VIEW OF THE MAIN FLOOR EXHIBITS.

opening of the exhibition had taken place in the afternoon, when possibly four thousand invited guests took advantage of the committee's invitation to inspect the exhibits before the evening rush.

The grossly inadequate show space afforded by the armory—the main hall is but 135 by 153 feet in dimensions—necessitated some Solomonesque adjudication to satisfy the claims of all the applicants for space, and that the committee seems to have satisfied nearly everybody argues well for their judicial acumen. All hands, however, seemed to realize the impossibility of getting a "quart foot into a pint shoe," and when the awards were made the members of the association were allowed to choose by lot the mid-floor spaces, the "unattached" tradesmen being relegated to the wall spaces and the quarters of the various companies on the first and second floors in the Broad street front. The result is that 51 exhibitors, including all the 37 concerns showing complete cars, are rather closely crowded together in the main hall, while the company rooms accommodate nearly a score of accessories exhibits—and everybody seems happy.

But this very dearth of space has turned out to be a blessing in disguise, for the committee was compelled to make arrangements for an auxiliary street show, including all the two score establishments which go to make up "Automobile Row," extending for three long blocks from Callowhill to Cherry streets. This feature was taken hold of with a will, and when the mayor turned on the current in the armory the same touch showed up both sides of Broad street for a distance of a third of a mile, decorated with continuous festoons of electric lights, which were reinforced by the individual displays of the agencies and branch houses, and managers of which seemed to vie with each other in making attractive displays in front of their several establishments. As a crowning feature the electric decorations of the City Hall, still in place from the annual New York celebration, were turned on and formed a magnificent background looking down Broad street. This feature will be continued throughout the week, and on Thursday night the general gayety will be added to when an automobile carnival, a huge fancy dress parade of autos of all varieties, will hold the boards. This has been divided into touring car, limousine and runabout divisions, and numerous prizes will

be distributed to the most tastefully decorated cars in each class. Although a few late applicants for space who desired to show cars and about a score of would-be sundries exhibitors were perforce left out in the cold, the committee feels that it has made no mistake in selecting the armory, if for no other reason than that demonstrations—a most important feature of local shows—can be given with convenience and dispatch. The close proximity of all the large "row" concerns and big garages permits of much more effective work in this particular than would have been possible had another and possibly larger but less conveniently located building been selected. The color scheme of the show is a combination of green, white and gold. The general effect is very pretty, although the overhead drapery is placed so low that it gives a squat appearance to the main hall.

As regards the number of different makes of cars on exhibition, the committee claims that the Palace show did not and that the Garden display will not equal it. About 55 distinct makes are represented in the 37 exhibits, of which seven—Mercedes, Fiat, Darracq, Rochet-Schneider, Hotchkiss, De Dietrich and Renault—are foreigners. Of the American cars the Matheson, Walter, Berliet, Pierce-Arrow and Packard seem to attract the most attention. At any rate, the combined exhibit is a most representative one, including about all the better known foreign and American cars.

Of the latter the only novelty seems to be the Autocycle, exhibited by the Vandegrift Automobile Company, of this city. It is a 6-horsepower runabout with single rear drive and single front steer wheels and with side bearing wheels. A maximum speed of 45 miles an hour is claimed for the Autocycle, and that it is a most easily handled vehicle can be attested to by the many who have been given a demonstration of its working qualities outside the armory.

The display of "battle-scarred" veterans is noteworthy. The winners in the recent endurance test, in all their hard-baked mud-diness, repose in the best places in the various booths, the Stevens-Duryea, the Autocar, and the Matheson (which, although disqualified, finished with a clean record), all contributing in this respect. At the De Dietrich booth is shown the very car which finished first in the Ardennes Circuit and third in the Vanderbilt Cup race, with the great Duray himself to add luster to the display. Joe Tracy and his racer are at the Locomobile stand.

Auxiliary Show of the Streets.

In addition to the "Overflow Show," which includes practically the third of a mile of "Row" establishments, there is an



AN ATTRACTIVE CORNER AT THE PHILADELPHIA SHOW.

auxiliary exhibition on the street outside the Armory, where the commercial vehicles and not a few pleasure cars lay all day, with conversation artists in charge, to descant on their merits. Here may be seen the Mitchell, National, Frayer-Miller, Deere, American, and other cars whose agents were unable to secure space, besides others for which there is no room in the rather limited allotment secured by their representatives inside, who were compelled to choose between which of two or more cars they prefer to show. The Kelsey Company, handling the Maxwell, is showing the new four-cylinder car at the salesrooms. The Quaker City Automobile Company, which handles six cars, gave up the attempt to make a comprehensive display, and but one each of the Pope-Hartford, Pope-Tribune, Pope-Waverley, Pope-Toledo, Franklin and Peerless is shown, the big salesrooms down the street housing the remainder of the exhibit.

as long as he could. At six o'clock Monday night it had scored nearly 130 hours. The car shows up at the Armory at intervals between trips to Wilmington, Norristown, Westchester, relays of operators and observers being taken on every few hours.

The Accessories Exhibition Is Quite Extensive

considering the limited amount of room at the committee's disposal. One of the features of the tire department is a demonstration of the process of making Ajax tires.

But two motorcycle exhibits were in place on Monday night—the Reading Standard and the Bradley—although the Simplex exhibit was expected to arrive at any hour.

Philadelphia Car for Vanderbilt Race.

A report going the rounds of the show has it that Philadelphia will be represented in the next Vanderbilt cup race, if not in



FIRST REGIMENT ARMORY, ON BROAD STREET, PHILADELPHIA, INSUFFICIENT IN SIZE TO ACCOMMODATE THE EXHIBITS.

W. J. Sprankle is in a similar fix, and is showing what he can of his Premier-Reo-Hotchkiss line. The Foss-Hughes Company, handling the Pierce, Cadillac and Baker electric; the Rittenhouse, with the Pungs-Finch and the Wayne; T. M. Twining, with the Crawford, Marion and Autocycle; the Spencer-Wilkie Company, with the Glide and Compound, and several other "Row" concerns are all working the double-exhibit scheme. There was no help for it.

The commercial contingent, for which there is absolutely no room in the Armory, is contenting itself with a street show outside. Among the cars in evidence are the Glidden tour Knox truck, the Reliance truck and the Mitchell delivery wagon, while the Autocar is showing a brand new delivery wagon at its salesrooms in the block below.

Martin & Hart, local Thomas agents, are making a big hit with the "60" Thomas which competed in the recent endurance run to Harrisburg. The car was started at the State Capital last Wednesday morning at 8.23, and the engine ran so beautifully all day that Aubrey H. Martin decided to keep it going

the final, at least in the elimination event. The car in question will be the Bergdall-Ambler, built by the recently organized Bergdall-Ambler Company, of this city, which is now erecting a huge salesroom, garage and factory at the northeast corner of Broad and Wood streets. Few details are obtainable, except that the car will develop 75 horsepower, and that the preparations have passed beyond the paper stage. The Bergdall-Ambler Company recently obtained the United States rights for the Benz, a German car.

The "first sale" competition, a feature of each recurring show here, was won by L. E. French, the local Cleveland agent, who disposed of a car to George S. Rominger, a local merchant, at 2.30 Saturday afternoon. The souvenir fiend even has a look-in. The local Glide agents are handing out a song entitled "A Jolly Old Ride in a Glide," and at the Quinby booth a handsome 12-page calendar exhibiting various styles of automobile bodies is being distributed gratis.

Among the numerous novel advertising schemes adopted by the various concerns, that of the White Company is attracting most

attention. Four huge kites hold aloft several American flags and a yellow banner setting forth the fact that the White is at the top of the heap. At night a searchlight, located on the roof of a nearby building, throws shafts of colored light on the kites and their burden.

Roll Call of the Philadelphia Trade.

The following are the active and associate members of the Philadelphia Automobile Trade Association:

Officers: President, Gilbert F. Smith; vice-president, H. Bartol Brazier; secretary and treasurer, George T. Thompson; assistant secretary, Arthur J. Pursell.

ACTIVE MEMBERS.

The Autocar Company, 249 North Broad street.
H. Bartol Brazier, 38th and Market streets.
Diamond Motor Car Company, 2119 N. Broad street.
Eastern Automobile Co., 326 N. Broad street.
Ford Motor Car Company, 451 N. Broad street.
Foss-Hughes Motor Car Company, 201 N. Broad strsst.
Gawthrop & Wister, 244 N. Broad strset.
Hamilton Auto Company, 206 N. Broad street.
Hills Motor Car Company, Broad and Chsrry streets.
Thomas B. Jeffery Co., 242 N. Broad street.
Kelsey Motor Co., 238 N. Broad street.
Keystone Motor Co., 238 N. Broad street.
Locomobile Company of Amsrica, 249 N. Broad street.
Marion Motor Car Company, 218 N. Broad street.
Martin & Hart Motor Car Co., 215 N. Broad street.
Mercedes Import Company, 153 N. Broad street.
Motor Shop, 317 N. Broad street.
Philadelphia Reo Motor Car Co., 242 N. Broad strset.
Quaker City Automobile Co., 138 N. Broad street.
Smith Mabley Co., 1407 Locust street.
Titman, Leeds Company, 316 N. Broad street.
Winton Motor Carriage Company, 246 N. Broad strset.
White Sewing Machine Company, 629 N. Broad street.

ASSOCIATE MEMBERS.

Diamond Rubber Co., 304 N. Broad street.
The Flak Rubber Co., 138 N. Broad street.
G & J Tire Company, 711 N. Broad street.
Jas. L. Gibney & Brother, 211 N. Broad street.
Hartford Rubber Works Co., 138 N. Tenth strset.
Michelin Tire Agency, 322 N. Broad street.
George W. Nock, 126 N. Fourth street.
Penn Auto Supply Co., 201 N. Broad street.
Pennsylvania Rubber Company, 615 N. Broad street.
Philadelphia Automobile Accessories Co., 2041 Arch street.
Paul P. Ripplen, 1207 Race street.
Ross Manufacturing Company, 910 Arch strset.

KANSAS CITY SHOW PLANS ARRANGED.

KANSAS CITY, MO., Jan. 7.—Kansas City's automobile show, March 4 to 10, will be in charge of an advisory committee appointed by the Dealers' Association, although a private organization will have charge of the details, subject to approval by the dealers. The dealers will get 50 per cent. of the net profits, pro rated according to the space they occupy. This ends a fight which has been waged for recognition by the dealers and in which they have been eminently successful. It has also resulted in the formation of an effective association, something the Kansas City trade has needed for a long time. Next year, according to the agreement made with the promoters of the show, the event will be entirely in charge, in all details, of the dealers. For this year space has been liberally taken in Convention Hall, of more than ample size to accommodate all exhibits. Interest in the show, in spite of its rather late date, is considerable and promises to give the trade a considerable boost.

After several preliminary meetings, the dealers got together January 3 and organized with the following officers: President, F. B. Doddridge, Missouri Valley Motor Co.; vice-president, C. F. Ettwein, Ettwein Motor Car Co.; secretary and treasurer, E. P. Moriarty, E. P. Moriarty & Co.; directors, W. R. Demster, Demster Machinery Co.; C. C. Meade, Ford Motor Co.; C. E. Cook, Palace Auto Co.; J. J. Wittman, Pope-Toledo Motor Car Co.; W. S. Hathaway, Buick Automobile Co.; Frank Bales, Cadillac agent.

CLEVELAND AND BUFFALO SHOWS CONFLICT.

CLEVELAND, Jan. 7.—The Cleveland and Buffalo local shows conflict in dates this year, coming exactly at the same time, but it is not believed that there will be any serious interference either in the matters of exhibits or attendance. Practically all the cars exhibited here will be shown through local agents, and the same is true of most of the lines of accessories, as the big Cleveland houses now handle practically everything that is built for or used on a car. The Cleveland show probably has somewhat the best of the bargain from the fact that it has secured a sanction from the motor and accessories manufacturers and will receive the support of that organization. It is claimed that had the local dealers been so inclined they could have nipped the plans of the Buffalo people before they were fairly developed. Instead they replied that they had no objection to the Buffalo show being held the same week, believing, as stated, that there would be no interference.

George Collister, manager of the Cleveland show, has received a communication from D. J. Post, president of the Motor and Accessories Manufacturers (Inc.), asking that the local officials do all in their power to correct one of the abuses which has heretofore annoyed people at local shows; that of allowing parties who purchase no space to roam from booth to booth with samples in their pockets and solicit orders.

WORCESTER TO HAVE AN AUTO SHOW.

WORCESTER, MASS., Jan. 7.—Frederick N. Prescott, promoter of the Portland and Providence automobile shows, plans to have a show in Mechanics Hall. It will be the first Worcester has ever had, and will be the first in New England this season, the Boston and other shows following a month or two later.

Mr. Prescott has room, according to his plans, for about twenty large exhibits, Worcester dealers being let in first. The only hitch will be in getting the big cars into the hall, which is of the two-story kind. If he cannot get the cars in the hall, he has arranged matters whereby he can secure other quarters in Worcester. There is scarcely any doubt about the show going through. Whether or not the Worcester Automobile Club will have anything to do with the affair has not been definitely determined, although President J. P. Coughlin is soon to be a dealer. As now arranged, the show will be held the week beginning February 11.

TEMPORARY RECEIVER FOR E. H. V. CO.

O'Brien, Boardman, Platt & Dunning, attorneys, of New York City, acting for four creditors of the Eisenhuth Horseless Vehicle Company, of Middletown, Conn., have filed a petition in the United States District Court asking that the company be declared bankrupt. Creditors named are Charles L. Hoffman and George D. Provost of New York, N. Townsend Thayer of Brooklyn, and W. F. Faulkner of Morris Park, N. Y., and the amount of their claims is \$1,107.91. They allege further that the company has more than twelve other creditors. Acting upon the petition, George T. Schull, of Middletown, has been appointed temporary receiver of the company, and is required to file a bond of \$50,000. The Eisenhuth company has had considerable financial trouble in the past, and the action taken was not unexpected.

TRADE CREDIT ASSOCIATION MEETING.

The annual meeting of the Automobile Trade Credit Association will be held Thursday evening, January 17, at the New York Athletic Club, at which time directors will be elected to fill vacancies. The meeting is scheduled for half past five o'clock in the afternoon, and will be followed in the evening by an elaborate dinner. The members of this association are located in all parts of the country, and are banded together for protection against the extension of credit to weak or unscrupulous buyers. Its aims are effected through mutual cooperation of the members throughout the country. The association's offices are located at 80 Wall street, New York City.

APPRAISING IMPORTED CARS FOR CUSTOMS DUTY

By HARRY W. PERRY.

UNUSUAL interest will center in the work of the United States appraisers at the port of New York during the present week because of the large number of foreign automobiles that will arrive on the European steamers for exhibition at Madison Square Garden.

Owing to the great urgency of giving the importing agents immediate delivery of the exhibition chassis and complete cars



REMOVING A CRATE FROM AN IMPORTED CAR.

as soon as they are landed, and to the limited facilities of the appraiser's office, a special arrangement has been made with regard to show cars. The appraiser has consented to permit the machines to be taken, as soon as landed, direct from the wharf to the Garden, where they will be examined and appraised for the collection of the import duty.

Probably very few automobilists except the regular importers, and possibly the rare American who purchases a machine abroad and brings it home with him, know anything about the routine that a car goes through in its passage through the Custom House when it comes into the country.

"In the first place," said Deputy Collector H. L. Swords, when interviewed in his office at Christopher and Washington streets, "the machine comes from the wharf on a truck to the government garage and the invoice is placed in the hands of the examiner. No examination is made until the invoice is in hand. The car is then stripped of its wrappings and examined as to horsepower, maker's number, and accessories. If the price entered on the invoice is found right the return is made to the Collector, and delivery is made of the car when the duty has been paid at the Custom House on Wall Street."

For more specific information as to the method of making an examination, the writer was referred to Examiner Thumb. "We verify the bore and stroke dimensions as given on the invoice by making measurements of the cylinders," he said. "We do not go by the horsepower ratings, which are given at the minimum on the other side because of the horsepower tax in France. Bodies and all regular equipment as commonly included when a car, as distinguished from a chassis, is bought, are assessed at the same rate as the chassis—45 per cent. duty. Separate bodies take 30 or 45 per cent. as manufactures of wood or aluminum, as the case may be.

"Cars are often passed in a day," said Mr. Thumb, replying to further inquiries. "Frequently cars that come into the garage in the morning are released the same day. The examination sometimes does not take more than ten minutes, if the invoice is all right. But sometimes the machine is away down in the bottom of the hold of the ship, and it takes two or three days to land it.

"We sometimes get as many as twenty-two machines in a day," he continued, "and if the importations continue to increase as fast as they have during the last year, it looks as if I would have to have some help."

Mr. Thumb is the only examiner of automobiles for New York, and the number of cars imported during the year just closed averaged close to five for every working day. Some interesting figures showing the rate of growth of imports were given by Assistant Appraiser Harvey T. Andrews, who exhibited a sheet of figures giving the number of automobiles passed through the Appraiser's office each month from May, 1903, to the end of 1906. As this was merely a private record kept for the convenience of the office, he declined to give it out for publication. But the statement showed that the total number of cars imported through New York for the year 1904 was 602. For the following year the number had increased to 1,054, and the year 1906 showed an increase of 50 per cent., the number reaching 1,561.

Some very interesting sidelights on the work of the Appraiser's office, and the enormous volume of goods that it is called upon to inspect, were given by Mr. Andrews. "This is the ninth division of the United States Appraiser's Warehouse," he said. "It passes all manufactures of wood, stone and metal, including automobiles. Last year the imports through this division reached a total aggregate value of \$95,000,000, of which \$5,488,690 represent foreign automobiles. You can get some idea of the marvelous increase in the country's imports when I tell you that the increase in this division alone is represented by import values aggregating \$25,000,000 more than similar imports during last year. This is only the increase, mind you, while eight years ago the total valuation of all imports passing through this division was only \$20,000,000. The importations of automobiles have been on a gradually increasing scale year by year. When the present tariff law was passed in 1897 there was no such thing as an automobile coming through the port, and so there is no specific provision in the law to cover them. But the increase has been so rapid of late that it became necessary last October to set aside a special building for their storage while awaiting and undergoing appraisal. This building affords 7,000 square feet of floor space, and will hold from twenty-five to thirty cars at a time, which number is sometimes exceeded when the imports are heavy, as they always are in October and in January. For instance, you see that October was the largest month last year, when 220 were brought in, and also in 1905, when there were 138. Probably more than 200 will come in during January this year, and next week there will be an unusual number because of the auto show.



PUTTING THE EXAMINER'S STAMP ON THE ENGINE.

It is of interest to note, by the way, that we are already beginning to feel the influence of balloons and airships. About this time last year we passed several for the automobile show, and a number came through since then, so that it looks as if we shall soon have airships as an article of commerce. At first the department was at a loss to know what division to assign them to, but finally gave them to our division because of our familiarity with automobiles and their engines, and because all manufactures of wood and metal pass through the ninth division.

"The renting of a separate building for automobiles minimizes the danger of scraping and marring the fine finish of the cars and also facilitates the handling. The building is at Christopher and West streets. When the machines are taken there they are under the control of the Collector, who acts as custodian. We have nothing to do with them until they are turned over to us with the invoices for examination, and when the examination is finished they are returned to his care. Our work is simply to put the price on them; the Collector's force calculates the amount of duty from the prices and rates we give, and then collects the duty for the Government."



UNLOADING IMPORTED CARS AT GOVERNMENT GARAGE.

In the background is shown the United States Appraiser's Warehouse, where hundreds of millions of dollars' worth of imports are handled annually.

Asked how the valuation of a car was arrived at, Mr. Andrews replied: "We keep posted on the prices of all makes of cars and chassis by means of price lists furnished from abroad, and frequently know the prices even before the importers. Then the prices must also be sworn to on the invoices. If the price is not on the invoice, or does not seem correct, we mark our own valuation on it, and nobody can force us to change that valuation. Either the importer or the Treasury Department can ask for a second appraisal, if the former thinks the price is too high or the Government thinks it is too low. Then, if one or the other is not satisfied with our figures, appeal can be taken to the Board of General Appraisers, on the seventh floor of this building."

As it may not be generally known how the high duty of 45 per cent. comes to be charged on automobiles when such machines are not specified in the tariff, the assistant appraiser gave the following explanation:

"The law provides that where *ad valorem* duties are assessed the value for customs purposes is that which obtains in the country from which the article is imported when sold in the usual and ordinary wholesale quantities. As there was no specific provision in the tariff law of 1897 covering automobiles, they are classified for duty under paragraph 183 of the tariff, otherwise known as the 'catch-all' paragraph, which provides a duty of 45 per cent. *ad valorem* on all manufactures of metals not otherwise provided for."

"How is it," Mr. Andrews was asked, "that the automobiles brought in for exhibition at the show all have to pay the full 45-per-cent. duty? Is there not a provision in the law or some

department ruling to the effect that cars can be brought in free if re-exported within a certain period, as three months or six months? The question has created some discussion."

"No," replied the assistant appraiser, "there is no such provision relating to cars for exhibition. When exhibits of any sort are brought in for world's fairs they are, by special arrangement, permitted to come in free of duty under bond, and if not sold the deposit under the bond is refunded when they leave the country inside of a certain period. In 1903 the Treasury Department made a ruling that a tourist might bring in a car under bond for three months' use in this country. Afterward this was limited to apply only to foreigners. This ruling was broadened again about a year later so as to include cars imported for racing purposes.

"So at present there are three cases in which a car may be imported free, the first being the case of a tourist from a foreign country, who, by giving a bond, can enter his car for three months; the second, that of a foreign firm which may import a car for racing purposes; and, third, the case of any person who has owned and used a car abroad for not less than twelve months, and who may import it free under what is known as the 'household effects' clause. Thus there is no provision in the law nor any department ruling that will let us admit machines for the annual shows free of duty. However, most of the cars put on exhibition are those of leading French, German and Italian firms, whose products have been so well advertised that the demand exceeds the capacity of the factories, and the cars seen at the shows are already sold or are certain to be bought before the shows end. In either case the car will remain in this country and duty will have to be paid, so that nothing would be gained by bringing it in free under bond, even if it could be done."

It will perhaps be of interest to add that any car taken abroad for touring and reimported, whether of domestic or foreign manufacture, is admitted free of duty, provided that only the ordinary necessary repairs and replacements have been made on it. This might include a set of new tires, a new lamp to replace one damaged, and other replacements, but if the car has been completely overhauled, repainted and refitted with foreign equipment, so as obviously to enhance its value, it must pay the regular 45-per-cent. duty, not merely on the increased valuation, but on the whole car and fittings. The only concession is that it will be appraised as a second-hand car, and the amount of duty to be paid will be correspondingly lower than on a new machine.

FROM THE INDIANA AUTO FIELD.

INDIANAPOLIS, IND., Jan. 7.—With factories already working overtime, all State agencies closed and sample cars displayed, and with several new concerns being organized and building plants, everything looks encouraging for a record-breaking output in Indiana this year.

Work has been started on the new plant of the Maxwell-Briscoe Motor Company at Newcastle, and it is expected that it will be ready for occupancy about July 1. Contracts for the foundation, calling for about 1,200 yards of concrete, have been let, and the steel work will be put up as quickly as possible. When completed, a force of about 1,200 men will be employed, and the yearly output will be fully 5,000 automobiles.

The Murillo Automobile Company, of Marion, has been reorganized as the Coppock Motor Car Company, and incorporation papers showing a capital stock of \$100,000 have been filed. Directors are: Harry Reynolds, M. Earl Brackett, Harry Ward and Lambert W. Coppock. It is the company's intention to manufacture a car suitable for carrying both merchandise and passengers.

Another new company is the Garrett Automobile Company, of Garrett. It has a capital stock of \$10,000, and will begin manufacturing automobiles shortly.

The Stanley Automobile Company, at Mooreland, is preparing to manufacture cars. One model, especially adapted for country and city use, will be made.



PLOUGHING THROUGH THE RICH RED MUD THAT ANSWERED FOR ROADS IN VIRGINIA AND NORTH CAROLINA.

OLDSMOBILE ON FLORIDA SOIL.

Despite the almost impassable nature of the country that has been traversed, the end of a week and a half of strenuous endeavor finds the variously christened Oldsmobile "alligator," "mudlark," and "pathfinder" across the Florida line, and almost within hailing distance of the long-sought goal.

Charlotte, N. C., was left behind last Friday afternoon, and after a strenuous drive of several hours the night was spent in a little place called Rock Hill—too small to be dignified by so much as a dot on the map. Whether Rock Hill is in North Carolina or South Carolina is a question that probably even the pathfinding party could not answer correctly. At all events, it is pretty near the line one way or the other, so that the next day's trip brought the party to Columbia—about half way across South Carolina, where the car and its occupants were greeted by the usual demonstration and bombarded with an endless string of questions regarding themselves, the car and the trip, not omitting a frequent invitation "to have something." The car and its passengers are arousing a great deal of curiosity.

Leaving Columbia the next day, Batesbury, S. C., was reached, where the next night was spent, another day's run bringing the party to Augusta, Ga., on the Savannah river, which marks the

boundary line between the two States. After crossing the river into Georgia the roads took on a totally different appearance and character. Instead of the red clay of South Carolina, which sticks to everything like a long-lost brother, the deep and shifting sand of the Georgia pine forests was encountered, and, so far as the running was concerned, there was not a great deal to choose between them. And the pines brought another disadvantage with them, for Sunday found the party lost in what appeared to be an interminable stretch of pine trees, so tall and thick as to practically shut out the sunlight. These woods are higher and the roads are excellent except that they are so narrow that there is scarcely room for the car to pass without the hubs striking the trees, and they wind in every direction of the compass so that they are utterly bewildering. It is like a beautiful mystic maze, but so puzzling as to render one absolutely helpless. After several hours of aimless wandering, a clearing was stumbled upon and, after inquiring the way of the inhabitant of the sole house in sight, it was decided to put up there for the night.

To go back over the route that has been followed, the party found themselves in Danville, Va., on the evening of New Year's day, but twenty miles having been covered since morning, when



A FORD IN VIRGINIA OF WHICH THERE WERE MANY.



A TOUGH CASE OF BLOCK, TACKLE, AND JACK.



IN EVERY SOUTHERN TOWN THE TOURISTS AND THEIR CAR WERE A SOURCE OF MUCH WONDER AND EXCITEMENT.

Chatham, Va., was left. The roads are sticky red clay, which is a close brother to the "gumbo" mud of the West. This surfacing is a foot or more in depth and makes hard pulling under any circumstances, but on long upgrades the strain is terrific as such a mass of it has to be carried and shoved along by the car. But worse than the mud are the mud holes; they were always filled with water and gave no hint of their depth, so that the car frequently plunged into mud and water three or four feet deep, the differential being hung up on a rock every now and again so that the rear wheels would spin around with the engine racing at full speed until shut off. It was a good deal like a ship in a heavy sea with its propeller coming out of the water unexpectedly. Going like this has made the block and tackle, shovels and four pieces of plank the most valuable things on the car, and if there is any distinction to be made, it must be awarded to the planks, for they have proved to be worth their weight in gold.

Three miles an hour has frequently proved to be all that could be averaged, and the hour usually entailed forty-five minutes' strenuous labor with sapper's tools for every fifteen

minutes of driving. The roads surpass description; they are the worst imaginable, sometimes being totally submerged for long stretches so that the car swishes along with the mud and water almost up to the running board. The natives state that the roads in question are not used at all during the winter except in cases of urgent necessity, and then extra horses are required to make any progress at all. Mr. Owen thinks they are far better at certain seasons of the year, and with proper attention would soon be available all the year round. North Carolina has carried off the palm in this respect. The roads near the Virginia line in that State have been far and away the worst that have been encountered on the trip, and, though not a great deal better, there was sufficient difference in the southern part of the same State to make a distinction between them. Of course, a hotel is practically an unknown quantity in any place but the towns, though the people throughout the South are very hospitable.

Everywhere that a stop has been made the natives have been obliging and ready to lend every aid in their power, though frequently this has not been much, even in the line of information, and information in that section is essential.



A TYPICAL VIRGINIA HOME.



THERE ARE REAL BRIDGES.



CHAINS IN MUCH DEMAND.

A TRYING PENNSYLVANIA ENDURANCE RUN

PHILADELPHIA, Jan. 7.—The first annual endurance run of the Quaker City Motor Club, from this city to Harrisburg and return, last week was a most successful affair, thirteen of the original twenty-four starters finishing within the time limit. The winner of the Stillman Class B cup for cars costing \$1,500 or less turned up in W. George Brooks' Autocar, which had but five points penalty chalked up against it.



F. THOMPSON'S STEVENS-DURYEA WHICH FINISHED FIRST.

The fight for the honors in Class A developed a double protest against the only perfect-score cars—the Matheson and the Stevens-Duryea. The former was ruled out at Harrisburg by the committee for equipment shortcomings, its special testing body not conforming to the rule regarding touring-car trim. Mongini, who was at the wheel, took his disqualification with equanimity, left the capital at the specified time and finished without the shadow of a demerit. The protest against the Stevens-Duryea was an eleventh-hour surprise, and was filed by T. W. Berger, entrant of the Oldsmobile, which finished second in Class A, it being claimed that the Stevens lost its muffler on the outward trip, and continued the run minus that necessary article of automobile furniture, which would constitute a violation of Rule 8 of the conditions governing the contest. Berger, by the way, had very hard luck. His Oldsmobile had arrived at Harrisburg on the first day twenty-one minutes ahead of time, and was waiting behind the line, with motor running, for the officials to check him into the control, when some of the mud picked up on the way worked into the carbureter and stopped the engine. The mishap cost him the only two points charged against his car. This unusual cause of stoppage demonstrates more clearly than any word description the extraordinary bad conditions of the road. Even on a very muddy road with a moderate under-surface foreign matter will never penetrate to the carbureter. Only axle-deep mud could reach this important organ.

The protest filed against the Stevens-Duryea was subsequently allowed, but the penalty inflicted, one point, did not change the relative standing of the cars, as the Oldsmobile, which finished in second place, had two points charged against it. The local Matheson people have their car on exhibition at the Armory show, labeled "The only car which finished the endurance run with a perfect score."

A protest filed against Charles Hoffman's Simplex, on the ground that it was not fitted with a regular touring car body, was also sustained, and the car returned to Philadelphia as a free lance, doing "first aid" work and acting the Good Samaritan generally.

Some Things That Happened to the Participants.

"Wally" Owen had hard luck with his Cleveland. After plowing through the mud on the first day, and passing all the inter-

mediate controls on his schedule time, he was within half a mile of the Keystone Garage in Harrisburg—the official stopping place—when the engine stopped owing to overheating, due to a leak in the radiator. When he checked in "Wally" was 49 points to the bad.

One particularly plucky performance was that of No. 4, Aubrey H. Martin's 40-horsepower Thomas Junior. Four miles beyond second control on the outward trip—Sadsburysville, 45 miles—the main shaft snapped in half. After a council of war the crew decided to repair it. There was no machine shop at Sadsburysville, and, leaving Observer J. R. Baltz to watch the car, the others trudged back through the deep mud four miles to Coatesville, where they finally located a small shop—closed on account of the holiday. They hunted up the owner, and he accommodatingly gave them the run of the establishment. In ten hours they managed to finish up a substitute, and then floundered back through the mud and darkness to where the crippled car lay—with the faithful Baltz curled up fast asleep in the tonneau. With only the light afforded by the car's lamps, the new shaft was put in, and at 3:25 the next morning, having lost fourteen hours, the trip was resumed. Harrisburg was reached at 8:04 A.M., and the return trip was started at 8:13. The makeshift shaft made good, and the finish was made on schedule, although the car had been ruled out for not finishing the first leg of the course within the limit.

Highway Conditions a Striking Object Lesson.

The road conditions, especially during the first day's run, were simply frightful. A three-days' downpour had made quagmires of all but the best roads. Thirty of the thirty-seven miles between Lancaster and Harrisburg were so bad that the finishing of twenty-two of the twenty-four starters is considered little short of remarkable. If there was ever an object lesson given for the necessity of immediate road improvement in Pennsylvania the first midwinter run of the Quaker City Motor Club amply demonstrated it. There is no reasonable argument, barring the existence of a heavy fall of snow, to be advanced against a winter trip, such as was projected and carried out by the club, and the very fact that it was successfully accomplished speaks wonders for the pluck and endurance of the participants and the cars that were driven over the well-nigh impassable highways, if in reality, some of them are worthy of being dignified by that name.

The movement for highway improvement in the Keystone State will necessarily be advanced by the recent run, as it will bring the citizens of the commonwealth to a realization of the



W. G. BROOKS AND HIS WINNING AUTOCAR.

conditions existing, such as no other practical demonstration would be capable of presenting. The route, with the official controls, distances and schedule time, was as follows:

FIRST DAY, JAN. 1.	Distance.	Time.
Philadelphia to Malvern.....	23.1 miles	1 h. 30 min.
Malvern to Sadsburyville.....	21.5 "	1 h. 5 min.
Sadsburyville to Lancaster.....	22.7 "	1 h. 20 min.
Lancaster to Elizabethtown.....	19.4 "	1 h.
Elizabethtown to Harrisburg.....	17.4 "	1 h. 20 min.

104.1 "

SECOND DAY, JAN. 2.

Harrisburg to Lebanon.....	25.2 miles	1 h. 40 min.
Lebanon to Reading.....	29.3 "	1 h. 25 min.
Reading to Pottstown.....	20.6 "	1 h.
Pottstown to Norristown.....	15.5 "	1 h.
Norristown to Philadelphia.....	18.9 "	1 h. 30 min.

109.5 "

MacDonald and Campbell Cup, Class A.

	Penalties.
1. Stevens-Duryea; owner, Geo. F. Thompson; driver, F. W. Aurig.....	1
2. Oldsmobile; owner and driver, T. W. Berger.....	2
3. Lozier; owner, M. E. Brigham; driver, H. Michener.....	3
4. Studebaker; owner, E. C. Leeds; driver, F. H. Yerger.....	17
5. Oldsmobile; owner, G. H. Gantert; driver, John Tallies.....	48
6. Locomobile; owner, Richard Sellers; driver, J. W. Flonda....	53
7. Cleveland; owner and driver, Wallace Owen.....	117
8. Thomas Flyer; owner and driver, E. R. Kelly.....	191
9. Cadillac; owner and driver, F. W. Stockbridge.....	211
10. Stearns; owner, L. D. Berger; driver, O. H. Hoffman.....	324

H. B. Stillman Cup, Class B.

1. Autocar; owner and driver, W. G. Brooks.....	5
2. Rambler; owner, G. W. Barbier; driver, Harry Wallis.....	230

The Frayer-Miller car, which won the Berkshire Hills economy run of the New York Motor Club last November, finished No. 11 in Class A, a series of disheartening tire troubles giving it 709 points in penalties.

DELAWARE'S GOVERNOR HAS SUGGESTIONS.

WILMINGTON, DEL., Jan. 7.—The Delaware Legislature, now in session, will probably make some changes in the automobile law passed at the last session. The biennial message of Governor Preston Lea contained the following:

"The protection of the public against careless and reckless motorists has rendered necessary a revision of the present law touching motor vehicles. Accidents arising from automobile driving are frequent. Excessive speed is the chief cause and inspires the dread and prejudice on the part of the traveling public against automobiles. As a vehicle of utility the automobile should be recognized as possessing the same right as all other vehicles in the use of our highways, subject, however, to certain restrictions inherent in the character of these machines. I recommend that the present law be so amended as to provide:

"1. For an annual payment of a license fee of \$5 by the owner of every motor vehicle.

"2. For the annual payment of a license fee of \$2 by chauffeurs.

"3. For the revocation of all licenses under proper restriction, upon proof that the licensee is an incompetent or reckless driver.

"4. For the employment by every person incompetent to run a motor vehicle of a licensed chauffeur.

"5. For the payment of all such license fees, together with all fines and forfeitures imposed under the provisions of the law; to the State treasurer, who shall carry such funds to a highway improvement fund to be expended pursuant to a proper highway improvement statute.

"Pecuniary penalties have not proved effective in checking reckless and careless driving. Fine and imprisonment has been demonstrated to be the only effective check, fine for the first offense and fine and imprisonment for all subsequent offenses."

With Russian caviare concealed in the hollow rims of his automobile, a smuggler was recently detected by customs officials crossing the Russo-Austrian frontier near Cracow.



T. W. BERGER'S OLDSMOBILE, WHICH FINISHED SECOND IN THE QUAKER CITY MOTOR CLUB'S ENDURANCE RUN.

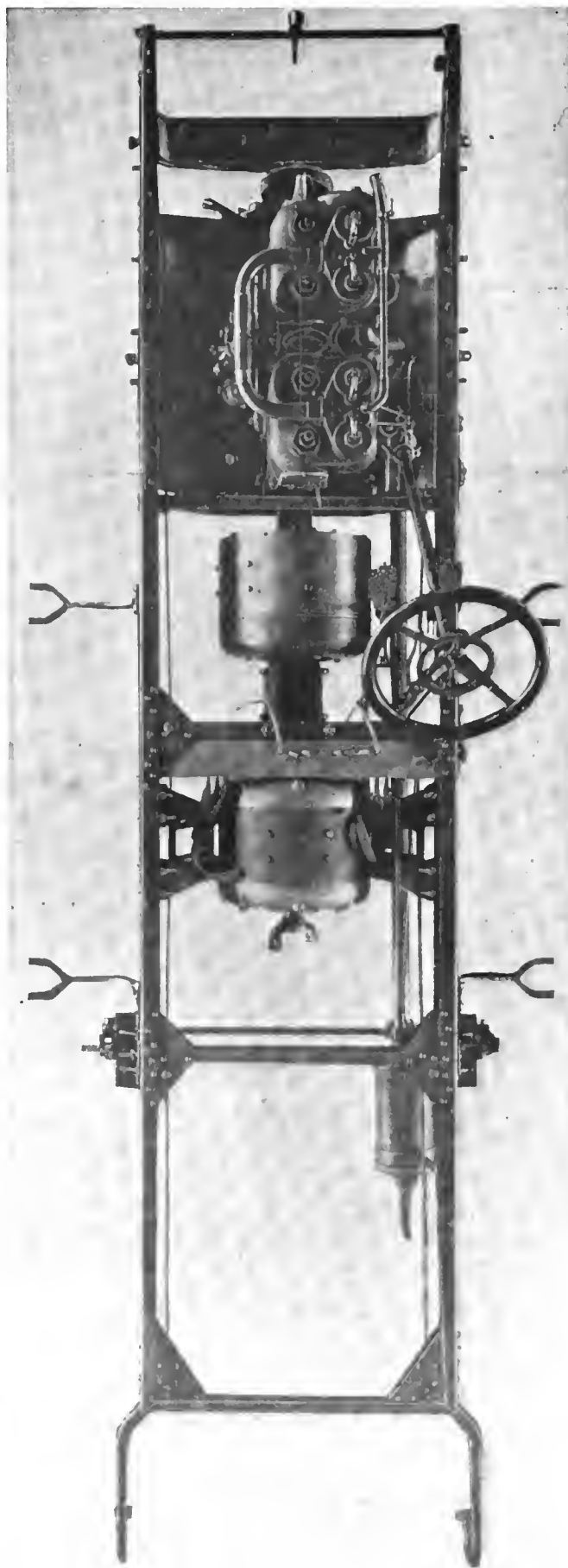
THE COLUMBIA GASOLINE-ELECTRIC.

Electricity has long been regarded as promising a solution of the vexatious problem presented by the "gearless" car which represents the aim of the designer. While others have been seeking this end along the path of multiplication of cylinders in order to attain the infinitely flexible motor, the Electric Vehicle Company has been studying the problem from a totally different point of view, that of interposing an electrical connection between the motor and the driving wheels instead of a mechanical union such as is at present typified by the usual clutch and change speed gears in which pinions are slid into mesh. The latter is a system that has always been reputed to violate the first principles of engineering, and the frequency with which early change speed gears were wrecked seemed to bear this out.

Nor has the motor of many cylinders solved the problem, although in the hands of a skillful driver it has been found possible to cover long stretches of country that would call for frequent changes of gear with the ordinary four-cylinder motor in the hands of the ordinary driver. Multiplication of the number of cylinders has undoubtedly marked a step toward the realization of the gearless, but whether it will in the end prove to be a step that will result in the achievement of this goal, or merely one taken in the wrong direction, remains to be seen. In the meantime, the long step that has been taken toward the development of electricity for the same purpose is of considerable interest. The idea of utilizing the power of the motor to generate an electric current which was reconverted into mechanical power through the medium of electric motors has been one that has appealed to investigators in this field for the past several years, and numerous systems have been devised, the majority of them involving the use of a storage battery, while the location of the motors has varied in others, being placed directly at the wheels in some cases, and directly behind the generator in others, a mechanical connection being employed in driving on the high gear in the latter case.

This is the form that has been adopted by the Electric Vehicle Company after close to two years' experimenting with various modifications of the system, during which period the new chassis has been put to continuous and severe tests under service conditions to bring out any latent defects such use would tend to reveal. As will be seen from the accompanying plan view of the new gasoline-electric chassis, the flywheel of the ordinary motor has been displaced by the generator which is direct connected to the crankshaft of the motor and which hardly occupies more space than the wheel which it displaces. In other respects the motor is of the standard four-cylinder vertical type employed on the Columbia cars. Immediately behind the generator the motor is placed, though, as already mentioned, there is no mechanical connection between the two on any but the high speed when the crankshaft of the motor and the propeller shaft terminating at the live rear axle become solidly coupled and both the dynamo and motor run dead.

The lower speeds, of which there are five forward and a reverse, are all provided by means of a small lever similar to the controller handle employed on street railway cars. This actuates the electrical controller connected to the generator and the motor and permits of the variation of the voltage and amount of current sent into the latter in order to obtain the range of speeds mentioned. This is effected by throwing the windings of the generator armature and field into different electrical relation with the armature and fields of the motor in order to avoid the use of a dead resistance which would merely waste the current at low speeds. No storage batteries are employed, thus greatly simplifying the power plant and the wiring as well as greatly reducing the weight, which has always been the disadvantage of cars on which it was a feature. The low speeds are used in starting, the motor being capable of a heavy overload, and when up to speed a clutch is employed to couple the motor and propeller shafts and the car runs exactly the same as one equipped with the usual change speed gear.



CHASSIS OF COLUMBIA GASOLINE-ELECTRIC CAR.

FRENCH GRAND PRIX AND THE GOVERNMENT

PARIS, Jan. 1.—Owing to persistent assertions in usually well-informed quarters that the French Government intended to withhold permission for the Grand Prix, the Automobile Club of France departed from its usual plan and sent a deputation to wait upon M. Clemenceau, President of the Council. In previous years a circuit has been first selected, and only when the various local and district authorities have given their approval to the scheme has the club asked for Government permission. Headed by the Baron de Zuylen, president of the A. C. F., the commission, consisting of Baron de Turckheim, Louis Renault, M. Darracq, M. Brasier, René de Knyff, M. Collot, and the Marquis de Dion, waited upon M. Clemenceau on December 26 and urged the necessity of an annual speed contest, as in the past. One of the arguments put forth was that if the race was abolished exportations would decrease. "Americans," declared the Baron de Zuylen, "only buy cars which have made a name for themselves, or, at any rate, only buy from those countries victorious in international contests."

The head of the Government having objected that the old regulations appeared to have rendered all the services that could be expected of them, and to no longer contribute towards the amelioration of touring or town cars, M. René de Knyff explained that with the new regulations limiting the fuel supply to 30 liters per 100 kilometers, it was hoped to obtain marked improvement in automobiles. Economy in fuel consumption, improvements in transmission, and reduction in the weight of chassis will, said M. Brasier, result from the new regulations.

M. Clemenceau was of opinion that the fuel consumption was high, and, before giving a definite and official reply, asked the club to prepare a report, giving the old and new regulations, and submit it for the examination of Government experts. He assured them that there would be no delay, and, immediately received, the report would be studied and a prompt reply given. By January 15, at the latest, the Government decision will be known. The committee will urge: (1) The commercial advantages which French constructors have obtained from races; (2) the progress made in automobile construction for a number of

years owing to speed contests; (3) the attention which foreigners pay to the French Grand Prix, and the hope they have that this event may be forbidden in France. The A. C. F. is confident that M. Clemenceau, who has always shown himself liberally disposed towards automobilism, will grant the necessary permission.

Several circuits have been proposed, the latest favorite being one at Soissons, near Compiègne, one hour from Paris. The 1907 circuit must have good, wide roads with a very hard soil, must not be less than 38, or more than 60 miles round, have no control, neutralizations or grade crossings, must be near some important center with railway and lodging facilities, and must be as near Paris as possible.

Proposed Auto Legislation in the French Chamber.

When the 1907 budget proposal came before the French parliament a few days ago a strong effort was made by certain deputies to put a heavier financial responsibility on automobilists and the motor industry. An increased annual taxation on every automobile was first proposed, but rapidly abandoned. Would-be chauffeurs then received attention, a proposal being made to impose a tax of two dollars on every person applying for a license to drive an automobile. A stiff struggle took place between the motor and non-motor section before this was abandoned. There is a probability of the tax being brought up again on the next occasion. Finally two deputies of the Loire district, basing themselves on what takes place in Germany, proposed a graduated tax on all foreign machines entering France for touring. For four-cylinder cars the proposed scale was \$2 per day, \$12 per month, \$25 for four months, and \$50 for a stay of not more than one year. A formidable array of figures was brought forth to prove the importance of the train of gold left behind by foreign visitors, and after discussion the *Chambre des Députés* decided, for the present, not to submit American millionaires to further imposition when traveling over the good roads of La Belle France. It is estimated that over 3,000 foreign cars toured in France last year.

A GOOD ENTRY FOR THE EMPEROR'S CUP

PARIS, Jan. 1.—With an entry list of 39 cars, likely to be increased by another dozen by the end of the year, the success of the race for the German Emperor's Cup on the Taunus circuit, June 14, is already assured. Fiat heads the engagement list, with Lancia, Nazzaro and Weillschott as her champions. Then follow Opel, Benz, Metallurgique, Bianchi, Mercedes, Adler, Protos, Minerva, Fahrzeug Fabrik, and English Daimler, most of them with three machines. On the closing of American mail France is represented by three Darracqs, to be driven by Wagner, Hanriot and Demogeot, one Mors and three Lorraine-Dietrich to be piloted by Duray, Rougier and Gabriel. Further French engagements are expected before final closing. Brasier participation will depend on the decision of the company directors to-day. N. Levavasseur, designer of the Antoinette motors, famous in motor boats and aeroplanes, gives hope of participating in the German race. Renault and Panhard, on the other hand, will certainly not compete.

Nominally a touring competition, the German Emperor's Cup is in reality a speed contest for machines with a cylinder capacity limited to 8 liters, and weighing not less than 1,175 kilos with racing body and tires, but without gasoline, oil, water or spare tires. The circuit will have a length of about 52 miles, to be covered six times, giving a total of rather more than 300 miles.

Although the exact course has not yet been decided upon, it is certain that a portion of the 1904 Gordon Bennett circuit will be utilized. Three projects are before the German Club, and a final decision will be made early in January.

The course having the most chances of being accepted starts from Hamburg to Saalburg, Wehrheim, Usingen, Graevenwiesbach, Noettau, Einhaus, this portion being the 1904 Gordon Bennett course. At Einhaus, instead of turning to left, the road continues straight to Weilburg, and at the entrance to this village turns sharply to the left and returns by Essershausen, Ernsthausen, Schmitten and Ober to Hamburg. This circuit gives forty-eight miles to the round, which, being cover five times, makes a total distance of 240 miles. There are no controls or neutralizations. Unless state affairs intervene, the German Emperor will be present at the race bearing his name.

Final entries for the German race closed at Paris and Berlin on December 31, the entrance fee being 3,000 marks per car. Gasoline and tire stations on the course are rented at an additional 1,000 marks. It has been found necessary to close the entry list six months before the date of the race in order to leave time to choose a circuit suited to the number of cars engaged. Tires and gasoline men are allowed until May for engaging stations.

WHAT MASSACHUSETTS' GOVERNOR RECOMMENDS

BOSTON, Jan. 7.—In his inaugural address to the Legislature, Gov. Curtis Guild, Jr., made some very radical recommendations for new automobile legislation, and some which are not at all relished by the automobilist. His recommendations included one for a new tax based on horsepower, and one for an examination board before which every applicant for a chauffeur's license must appear. His recommendations in part were as follows:

"Another source of taxation that I believe to be equitable is this: that he who is especially responsible for the waste and damage of public property would pay for any unusual damage that he causes. The suction of the automobile tire, for instance, is the cause of exceptional damage to the roads of the Commonwealth. I recommend a tax on all motor cars proportionate to horsepower, the entire proceeds to be devoted to the maintenance of State highways. I firmly believe that such a tax would alike remove much of the present complaint against this mode of locomotion and would vastly add to the comfort of all who use the highways for any purpose.

"It is evident that in another direction the Highway Commission must be given ampler powers. The abuse of automobiles is not decreasing; it is increasing. No engineer can take charge of a steam boiler without an examination. A locomotive engineer must serve a long apprenticeship before he is put at the throttle, though he moves only over set rails, on a line where every vehicle but one like his own is a trespasser. The automobile chauffeur, without any examination, sometimes an overconfident young man, sometimes an inexperienced girl, is turned loose on the public highways in control of an engine nearly if not quite as dangerous as a locomotive. Not even a law as to right of way checks collisions with other vehicles.

"I recommend that, as the sailing vessel has the right of way over the steamer on the high seas, so the horse and pedestrian shall for like cause be given, as the weaker, the right of way over the automobile on crossroad and highway.

"I further recommend the establishment of a board of expert examiners for chauffeurs, acting under the Highway Commission. I recommend that no person, owner or chauffeur, without a certificate of examination in reasonable practical tests in motor management, shall be longer permitted to experiment with dangerous engines on the roads of Massachusetts, at the risk of the lives of the citizens of this Commonwealth."

What the Massachusetts Autoists Think About It.

Though many of the automobilists are inclined to wait a little before giving their opinion, there is a general feeling among them that something in line with the governor's recommendation for a board of examiners would be a good move. The examination should not be too drastic and searching, but it is admitted that it is too easy at present to secure a chauffeur's license. Even a strict examination, however, would not prevent reckless and careless driving, as some of the most expert chauffeurs are sometimes reckless and are often the fastest drivers. It is thought that the proposed examination should be more strict for professional chauffeurs than for owners.

In the matter of right of way the automobilists are also inclined to agree with the governor, although they would like to have a law, if it were passed, so administered as to make horse drivers and pedestrians obey the laws of the road as well as automobilists. It is feared that if a law were passed some horse drivers would interpret it to mean that they could monopolize the whole road to the exclusion of the automobiles.

In the matter of the horsepower tax, it is hard to find an automobilist who will agree with the governor. The automobilists point out that horsepower is an extremely variable quantity; that it has no direct relation to speed or weight, both of which factors are of the most importance in the effect of an

automobile on the highway. It is suggested that if the State needs more revenue, and it is found constitutional to impose another tax on automobiles, an annual registration fee, the same for all machines, and an annual licensing fee for operators would produce the necessary revenue.

The Highway Commission in its annual report will ask for an appropriation of \$50,000 additional for repairs on the highways for damage caused by automobiles, and it is to secure this additional money that the increased tax is proposed. In its annual report the commission will devote much space to a consideration of the effect of automobiles on the State road, but it will state that it believes that it is in a position to cope with the new conditions of traffic provided it has a sufficient appropriation. The commission will make only minor recommendations regarding the automobile laws, leaving the drastic recommendations to the governor and the special committee on taxation, which is preparing a report on possible sources of increased State revenue.

During the fiscal year ending November 30, 1906, the Highway Commission will report that the gross income from automobile registration and licensing of operators has been \$33,087.50, an increase of more than \$8,500 over the twelve months of 1905. The net income for 1906 was \$19,587.50, an increase of almost \$10,000 over the net income of 1905. During the eleven months of the new fiscal year of 1906 the commission registered 6,572 automobiles, 666 motorcycles and issued 151 manufacturers' or dealers' certificates. It issued in the same time 4,649 ordinary operators' licenses, 3,391 new professional chauffeurs' licenses, and 2,043 renewed professional chauffeurs' licenses.

The growth of automobile registration and the licensing of operators since 1903, when the first automobile law was passed, is shown in the following table:

CERTIFICATES OF REGISTRATION.

	1903.	1904.	1905.	1906.
Automobile	3,743	4,261	4,889	6,572
Motorcycles .....	....	....	533	666
Manufacturers and Dealers....	100	80	102	151
LICENSES TO OPERATE.				
Ordinary Operators	3,907	3,585	3,736	4,649
Professional Operators	692	1,335	2,392	3,391
" " (renewed) .....	.....	.....	741	2,043

During the first two years the registration of motorcycles was not kept separately from that of automobiles. In 1903 the gross income from the business was \$17,684. In 1904 it increased to \$19,162, and in 1905 to \$24,490.50. On account of the change in the fiscal year of the State, the figures for 1906 cover only eleven months, but the gross income in that time was \$33,087.50. In the same time the expenses increased from \$5,531 to \$13,500.

NEW YORK'S GOVERNOR ON GOOD ROADS.

ALBANY, N. Y., Jan. 7.—In his first message to the New York State Legislature, Governor Hughes commented upon the importance of the good roads movement in the following manner:

"The constitutional amendment of 1905 authorized an indebtedness not exceeding \$50,000,000 for the improvement of highways. For the first time the State has undertaken the construction and maintenance of roads in a systematic manner. It has been reported to me that surveys and plans for the improvement of about 2,500 miles of main roads have been approved by the various boards of supervisors throughout the State; that of these 2,500 miles about 800 miles have been constructed, and that in addition between 500 and 600 miles are under contract and will be completed during the coming year.

"With the exception of three counties, every county outside of Greater New York has petitioned for improved roads. It is of great importance that this work should go forward and that the system of main highways should be completed with expedition."

FRELINGHUYSEN ALMOST A STANDPATTER.

NEWARK, N. J., Jan 7.—Senator Frelinghuysen, author of the automobile law that has been beneficial or detrimental to New Jersey, according to the viewpoint, is inclined to make few changes in the present law. Interviewed by a *Call* reporter, the senator is quoted as follows:

"With reference to automobile legislation, you may say for me that I believe the bill passed last winter has been beneficial in its effects. While it was somewhat in the nature of experimental legislation, yet I believe it has demonstrated its usefulness, the main defect being, in my opinion, inadequate provision for the proper enforcement of the law."

The senator continued: "The bill, as originally presented, called for a force of twenty-one inspectors, one for each county in the State. Experience has demonstrated that this force is inadequate, and I am in favor of amending the bill by making an additional force of twenty-five inspectors, appointed to serve without pay. That this plan is feasible is demonstrated by the fact that some of the best inspectors under the old law were appointed from the ranks of the automobilists and served without pay. Already applications have been received from this class of autoists who desire proper observance of rights of highway."

Senator Frelinghuysen concluded the interview by remarking: "At present I do not see the necessity for any radical change. I am very much opposed to any change in the speed limit."

It is also understood that Commissioner Smith, of Trenton, who is chief of the department, has some notions regarding automobile legislation that he hopes to be able to have Senator Frelinghuysen draft in any amendments that may be made.

PROTECTIVE ASSOCIATION IN BALTIMORE.

BALTIMORE, Dec. 31.—At a well-attended meeting of the Automobile Club of Maryland, the Automobilists' Protective Association of Maryland was organized for the sole purpose of securing the amelioration of conditions that the automobilists claim are intolerably oppressive, in regard to the speed law. In the new organization there are neither membership fees nor dues, and all the members were pledged to use their influence for the election of officials who will give automobilists a square deal. The following officers were elected: President, Osborne I. Yellott; secretary, Charles B. Finley. An executive committee will be appointed by President Yellott in the near future. Whenever needed the league is to actively enter upon political campaigns to attain their ends, and will do everything in their power to right what they consider an injustice. The following resolution was unanimously adopted:

We, the motorists of Maryland, as a body, stand unequivocally in favor of the adoption and strict enforcement of such laws as are reasonably necessary to protect the public at large from the reckless and unreasonable use of the automobile on the public highways of the State, and to punish those who, by their handling of automobiles in any way endanger the safety of such public; but are unalterably opposed to any law or mode of enforcing the law which results in the punishment of an entire class of persons for the wrongful acts of a few of that class.

MINNESOTA TO HAVE SOME LEGISLATION.

MINNEAPOLIS, MINN., Jan. 7.—A new automobile law is being prepared for submission to the Minnesota legislature. The law is to be the joint product of the automobile clubs of Minneapolis and St. Paul, and will provide for a new system of registration for cars throughout the State. The law will also provide that large cars cannot be driven by persons under twenty years of age. A penalty will also be provided for proper punishment of chauffeurs who use cars without permission, and for the apprehension of those who pick up machines on the street.

The legislative committee of the Montreal Trades and Labor Council will request the Dominion Government to pass a law prohibiting the employment of youths below a certain age in driving delivery wagons or acting as chauffeurs of automobiles.

COMMENDS AUTOS FOR POSTAL USE.

WASHINGTON, D. C., Jan. 7.—A very interesting document is the annual report of Frank H. Hitchcock, First Assistant Postmaster General, and it is doubly interesting to the automobile world for the mention made of the use of automobiles in the postal service. That portion of the report is as follows:

"During the past year, for the first time in the history of the department, arrangements were made for the introduction of an automobile service in the collection of city mail. Under a contract that went into effect on the 1st of October last, two specially equipped automobiles are being utilized in the collection service of Baltimore. Favorable reports have been received regarding them, and the department is now planning for a similar collection service in several other places. It is believed that in large cities automobiles can be advantageously substituted to a considerable extent for the horse carts now employed so generally in collecting mail. By the use of automobile vehicles a much speedier collection service can be organized without added expense. Plans are now being considered also for the introduction of the automobile in other branches of the city postal system with the purpose of quickening, as far as possible, the handling of the mails. Unquestionably the motor vehicle can be made an important factor in the postal service, as it already is in other business enterprises."

VERMONT WANTS REGISTRATION RECIPROcity.

MONTPELIER, VT., Jan. 7.—The principal features of the new automobile law, recently passed here by the Vermont legislature, are a speed limit of 10 miles per hour in cities, villages and thickly settled territory, and 25 miles per hour outside. The penalty for violation of this provision is \$50 fine or ten days in jail, or both, for the first offense, and not over \$200 nor less than \$25 fine, or six months in jail for subsequent offenses.

The registration fee of \$3 is for machines of 20 horsepower or less, and \$5 for machines of over 20 horsepower, with an operator's license of \$2. The fee for a distinguishing mark of a manufacturer or dealer is \$25. Residents of other States or countries are not obliged to take out a license in this State if Vermonters are allowed a like privilege in the State from which the visitors come.

A penalty is provided for operating machines while in a state of intoxication, and the rear sign on the machine is to be illuminated at night or during a heavy fog by light from the outside. The new law is silent in regard to closing any of the State highways against automobiles, and has no impounding clause. It goes into effect on February 1.



40-H.P. LOZIER WITH NEW YORK SELLING FORCE.

In the car going from the Broadway salesrooms to the Madison Square Garden Show are C. A. Emise, S. Regar, W. S. Mead, F. C. Chandler, O. F. Thomas, Rene Beauchenien, and H. Michener, demonstrator.

THINGS DOING AMONG THE GARAGES.

Model Garage to Be Built at Little Rock, Ark.

A contract is about to be let by the Little Rock Auto Company for the erection of a handsome new automobile garage on the lot recently purchased by them at 311 West Third street. The building will be of pressed brick, two stories high, occupying a floor space of 52 by 118 feet, fireproof, and constructed according to the latest design for up-to-date garages. Inside arrangements will include offices for the members, ladies' separate waiting rooms and private lockers for customers. A compressed air machine for inflating tires will be installed with a line of hose running the entire length of the building, affording an easy means of inflating the tires to any machines as they may need it. There will be a fireproof oil house for lubricating oils and an underground tank for gasoline. An elevator and turntable will also be installed. E. P. Ladd is president, John F. Boyle, vice-president, and M. A. Treadway, secretary and treasurer, of the Little Rock Auto Company, with about thirty other Little Rock citizens as shareholders.

Pittsburg Will Have Two New Garages.

The Winton Motor Carriage Company's Pittsburg branch will begin at once the erection of a new garage to replace the one destroyed by fire a few weeks ago. The new building will have a frontage of 120 feet on Beatty street and will be three times the size of the old structure.

Manager McGiehan, of the Rainier agency, will open a downtown garage this month and will provide a good stopping place for owners of cars who drive into town in the morning or for out-of-town people who come into Pittsburg when touring and want a central place to stop.

Auto Inn Garage at Elyria, O., Increases Its Space.

N. R. Spear is now a part owner of the Auto Inn automobile garage, at Elyria, O., having purchased the interest of H. B. Hine line in that concern, and takes over the active management. The whole of the lower floor of the building has been secured and during the winter months facilities for the convenience of the trade will be installed.

BRIEF NOTES OF THE GARAGES.

Doud Brothers, of Chatsworth, Ill., automobile dealers, are preparing to build a new garage. They will carry agencies for the Buick and other cars.

It is reported that a garage 60 x 140 feet is to be built in Erie, Pa., at the corner of Sixteenth and State streets, or a building erected partly for garage use and partly for other purposes.

Kansas City, Mo., now boasts its first large electric sign as the result of the progressiveness of an automobile dealer. This is over Kingsley's garage and spells the latter word out in prominent letters.

Schwender Bros., Mankato, Minn., will shortly occupy the lower story of the garage building just completed for Fowler & Pay. It is of brick construction and is modern throughout in fitting and appointments.

Two recent additions to Philadelphia's garage facilities are the DeLancey garage, at Twenty-second and Pine streets and the Fifty-third street garage, at 420 North Fifty-third street, the latter under the management of F. R. Bayle.

A new building for the L. H. Fawkes Auto Company is to be erected in St. Paul, Minn., early in 1907. The plans have been drawn, and provide for a roomy garage, with a partial second story. The new place will be conveniently located on Sixth street.

Ballston Spa, N. Y., is to have another garage. It will be located at the corner of Front street and Milton avenue and will be in the shape of a two-story building of brick, erected by George West for Tracy W. Nichols. Cars will be handled on the first floor and the offices and machine shop will be on the second story.

A remodeled building of the three stories, on Sixth street, St. Paul, Minn., is to be occupied as a garage and salesroom by the C. P. Joy Automobile Company, which has operated on Minnesota street for two years. The Joy brothers control a big portion of the St. Paul trade, handling the Pierce, Packard, Franklin, Pope-Hartford and Waverley lines.

In order to accommodate its rapidly expanding business, the Acme Garage, Tacoma, Wash., has begun work on an addition measuring 50 by 100 feet, to be erected in the rear of its present establishment, giving a total floor space of 200 by 140 feet. In addition to representing two or three different makes of cars, the agency for a number of patented sundries has been obtained.

Jacksonville, Fla., is to have an up-to-date garage. L. C. Oliver, the local agent of the Ford Motor Company, of Detroit, Mich., recently bought out the Duval garage at 29-33 West Forsyth street, and will remodel the building in order to accommodate a much larger business. J. E. McCants, who conducted the Duval garage for the past four years, will be manager of the repair department.

The Citizen's Motor Car Company has just successfully concluded negotiations for the purchase of the northeast corner of Main and Seventh streets, Cincinnati, at a cost of \$110,000, and will immediately begin the erection of a three-story concrete garage, to occupy the entire plot, which measures 93 by 130 feet, at a cost of \$100,000. The company was recently incorporated with \$100,000 capital, which will shortly be increased to \$250,000. J. W. Tarbille, formerly with the Williams Valve Company, will be the general manager of the concern.

C. J. Bronson, who represents the Winton and Cadillac interests in Grand Rapids, Mich., has recently more than doubled the floor space of his garage at 42 to 50 Kent street by the addition of an annex 75 by 100 feet. This makes a building 100 by 125 feet on the ground floor and 50 by 100 feet on the second floor, the first floor being entirely clear, as it is unencumbered with posts. The Bronson garage is the largest Michigan's capital city can boast of, the next in size being that of the Richmond-Jarvis Company, at 11-13 Park street, with 12,000 square feet of floor space.

FAKE NUMBER TAGS AND CHAUFFEUR BADGES.

ALBANY, Jan. 8.—When Police Commissioner Bingham sent a representative to-day to ask Secretary of State Whalen for permission to copy the complete list of registered automobiles and chauffeurs in the State on file in his office, it became known that there is in New York a factory which turns out false badges for chauffeurs and false number tags for automobiles.

Executive Clerk James L. Mock, who was Commissioner Bingham's representative here to-day, told Mr. Whalen that the New York factory had turned out at least 10,000 badges for chauffeurs and numbers for automobiles. Only a few days ago, Mr. Mock said, the police arrested a chauffeur whose badge bore the number 26,000, while the highest chauffeur number on file at the office of the Secretary of State is 16,195.

There are about 40,000 automobiles and more than 10,000 chauffeurs registered here.



HOW THE LITTLE SPRING MOTOR RUNABOUT LOOKS.

AN AUTO FOR YOUNGSTERS.

The Elite Junior is a small automobile intended for the use of children, and its weight does not exceed sixty pounds. This miniature car is equipped with artillery wheels and ball bearings, pneumatic tires, oil lamps, horn, number tag, and an imitation coil box. Instead of a gasoline engine or electric motor, it depends upon a large steel coil spring for its source of energy. The speed of the car is never greater than five miles an hour, while the power is being used, and it is extremely simple to operate, there being only two foot pedals that need attention. The spring motor is wound up by a crank handle, and is so geared that it becomes very easy for a child to wind. The car is designed upon the lines of an up-to-date runabout.

MICHELIN HAS NEW AMERICAN AGENT.

E. Lamberjack, of Paris, who for a long period has been the export agent for the entire product of Michelin et Cie. of France, is at the present time in New York City, and has formed a company and taken over all the rights, effects, and good will of the Michelin Products Selling Company, Inc., of 31-33 West Thirty-first street, New York City. The new concern will be known as E. Lamberjack & Co., Incorporated, and will occupy the offices and salesrooms heretofore occupied by the Michelin Products Selling Company.

Under the new arrangement Michelin et Cie. will deal directly with their patrons in America, through the new house. One of the innovations will be a material reduction in the price of Michelin tires, which has been brought about through this arrangement.

NEW CORRESPONDENCE SCHOOL FOR OWNERS.

Makers generally have long realized that one of the chief causes at the foundation of most of the minor troubles encountered by the average autoist, is to be found in the ignorance of the latter. In other words, the automobile is one of the few pieces of machinery that is permitted to fall into the hands of men with practically no technical knowledge or experience. Various makers have appreciated the need of a better knowledge of the mechanism of their own cars on the part of those who purchase them or are to drive them, and have provided instruction of one kind or another, but efforts in this direction have not been attended with flattering success in every instance.

The Maxwell-Briscoe Motor Co. is about to enter this field in a totally novel manner. It has added a department to be known as "The Correspondence School of Motor Car Practise" for the benefit of owners of Maxwell cars principally, though others may benefit by it as well. The course consists of a series of lectures, supplemented by the text-book "The Making of an Automobilst," and other pamphlets on special subjects.

The school will be conducted by H. A. Grant, and will include among its other features a "Question Department." The cost of the complete course where owners of Maxwell cars are concerned, has been merely made to cover the cost of printing, while for others it is slightly higher.

ALCOHOL TOO HIGH FOR PRESENT MOTORS.

As was predicted by the knowing ones last spring, when the legislation relieving alcohol from taxation which went into effect on the first of the year was being promulgated and its optimistic supporters were prophesying the relegation of gasoline to the background, Joe Tracy's recent 100-mile run, using the new fuel, proved that while its use is perfectly feasible in the present-day motor, it is far from economical. Speaking of his experience with it, Tracy said that "aside from the price of the fuel, I found that a very much larger quantity of it was needed than of gasoline. We used about three times as much alcohol as we would have required of gasoline to do the same work. We did not get quite as much power. This, of course, was due to the fact that the compression was not high enough. Had we been using an engine built to use alcohol we could have done much better."

In addition to the explanation afforded by the above statement, it must be taken into consideration that the test was carried out under the most adverse conditions and that, aside from recording the total quantity of fuel consumed, no data of any kind was taken. There is little doubt that with a specially designed engine using high compression and long stroke and the lower price of the fuel that is bound to come when it has been on the market longer, a far more favorable showing would result. As it is, the chief fact of importance established by the test is that alcohol may be used in the standard motor without any changes whatever, and this alone is of considerable interest.

POPE COMPANY TOO BUSY FOR RACING.

TOLEDO, O., Jan. 7.—The announcement of the Pope Motor Car Company, through H. S. Leyman, assistant manager, that it will not participate in racing events this season, will come as a distinct surprise to those who have followed automobile racing since its inception. The Pope Motor Car Company has always been an aggressive competitor in every event in which it has entered, and has always been one with which to reckon, as the many trophies which adorn the company's office will testify. No reason is assigned for the decision to eliminate racing this season, but it is probably due to the heavy demand for standard cars, which is taking every possible effort the company can make.



A. G. SOUTHWORTH, NEW YORK POPE REPRESENTATIVE.
IN HIS POPE-TOLEDO.

NEWS AND TRADE MISCELLANY.

New machinery is being added by the Swinehart Clincher Tire and Rubber Company, of Akron, Ohio, which will allow an increase of 50 per cent. over present output.

E. P. Moriarty & Co., of Kansas City, Mo., are looking for a licensed car of popular price to add to their line. They are in the market for something to sell at less than \$2,500.

Starting at exactly 12:01 on the morning of January 1, Manager Thomas Hay of the Chicago branch of the Ford Motor Company claims the first 100 miles run of the year in the new 1907 six-cylinder Ford touring machine.

Plans have just been begun for a new building to be added to the Mason Motor Car Company's plant at East Fifth and Vine streets, Des Moines, Ia. The addition will be two stories high, 44x100 feet, and will be metal sheeting.

The records of the license clerk in the office of the city clerk at Cleveland show that 956 automobile licenses were issued by the city last year, indicating that between \$2,000,000 and \$3,000,000 was spent for automobiles in the Forest City last year.

An increase from \$200,000 to \$1,000,000 has been made in the capital stock of the Glidden Varnish Company, of Cleveland, O., to meet increasing business and provide for further extensions. The company's new factory is rapidly approaching completion.

The Hayes Manufacturing Company, of Detroit, Mich., states that it is incorrect that their plant, or any part of it, has been removed to Lansing. A branch has, however, been opened at Lansing in the Olds gas engine plant to take care of the firm's increased volume of business.

Behen-Faught Motor Car Equipment Company now occupies the entire first floor at 3961 Olive street, St. Louis, next to the Diamond Rubber Company agency. Dust-proof fixtures are specialized. Jno. J. Behen, George Maynard Faught, Ed. S. Studer, S. F. Behen comprise the executive staff.

Mrs. J. H. Cuneo, of Richmond Hill, N. Y., has just placed an order with the Rainier Company for a 35-horsepower Rainier car, which will be delivered to her in March. Mrs. Cuneo has achieved distinction in numerous race meetings and was the only female driver to compete in the 1906 Glidden Tour.

A site has been purchased and the erection of a new factory building commenced at 9 Center street, Detroit, for the Ross & Young Machine Company, doing business at 133-135 Farmer street in automobile parts and general machine jobbing. The firm expects to begin business in their new plant about March 1.

Owing to increased volume of business the Piqua Blower Company, of Piqua, Ohio, is being incorporated under the laws of that State with a capital of \$50,000. This corporation will take over the interests of the Piqua Foundry and Machine Company and will make a specialty of positive blowers and gas exhausters.

In response to recent advertisements, orders for 25 car loads (100 runabouts) were received in one day, December 24, by the Ford Motor Company. Immediate delivery of Ford machines is guaranteed by the firm's system of running the factory at its full capacity every week in the year.

The December output of the factory was 42 cars per day; on January 2 it was increased to 50 per day.

Colonel Edward S. Fowler, appraiser of the port of New York, states that during the year 1906 1,561 automobiles, including 128 domestic cars, of the total appraised value of \$5,488,690.11 were imported at this port, the corresponding figures for 1905 being 1,054, including 80 domestic cars, valued at \$3,972,297.31, and for 1904, 603 cars, valued at \$2,209,492.11.

W. Hildreth, manager of the Holsman Automobile Company, of Chicago, states that on January 21 the price of their Model No. 9 machine will be advanced to \$700 and their Model No. 10 to \$750. The firm's new factory, first occupied eight months ago, is now working to its full capacity, and more space will soon be planned. In 1907 the output will be from 1,500 to 2,000 machines.

Last week G. W. Gammack ran a regularly equipped stock model electric Columbia victoria-phaeton 75 7-8 miles on one charge of the battery, averaging a speed of fifteen miles an hour. This is the highest mileage recorded in any of the company's tests, and speaks conclusively for the superiority of this model. Mr. Gammack was handicapped over most of the distance by a driving rain.

The Hartford Rubber Works Company, of Hartford, Conn., has received the following letter from Clarkson Limited, motor car and omnibus manufacturers of Chelmsford, England: "We think you will be gratified to learn that one of the 34"x3½" tires originally supplied to us by you has now done about 27,000 miles upon a 16-passenger omnibus, and is still running. T. Clarkson, Managing Director for Clarkson Limited."

In the past year the Autocar Company of Ardmore, Pa., has installed 46 pieces of new machinery in their machine shops. One of the largest and most important pieces is a Landis crankshaft grinder which alone cost \$1,800. The nicety of the construction of this machine may be better understood when it is known that the Autocar system of factory tests requires each crankshaft bearing to be ground to the fineness of a fractional part of one thousandth part of an inch.

The Allyn Brass Foundry Company, of Cleveland, has now three plants running in full operation at Cleveland, Buffalo and Detroit, making it one of the largest producers of brass and aluminum castings in the world. Work has been commenced on additional buildings on the Detroit plant. Pierce Smith, formerly of the J. D. Smith Foundry and Supply Company, of Cleveland, is now connected with the Allyn Brass Foundry Company, and is representing them on the road.

The Minneapolis tire show became a one-day affair, January 5, instead of three days, as planned. The refusal of the tire manufacturers to allow northwestern representatives to exhibit resulted in the confining of the show to local repair houses and manufacturers and retailers of accessories. The big room of the clubhouse was well filled during the afternoon and evening. Exhibits were made by L. H. Fawkes & Company, the J. N. Johnson Company, O. Renstermacher & Company, the Evans Motor Car Company, and W. P. Shattuck.

The new four-story branch house of the Winton company, on Sherman square, Broadway and Seventieth street, New

York, is one of the finest automobile establishments in the world. The building contains 84,000 square feet of floor space, and, having been constructed exclusively for automobile purposes, has every conceivable up-to-date facility. The manager of this establishment, C. W. Churchill, was formerly a Cleveland. His elevation to the New York management illustrates the Winton idea of giving preference in appointments to men in the Winton ranks.

The entire 1907 output of the Autocar Company, of Ardmore, Pa., has been sold to the following dealers: Geyler & Levy, Chicago; Middleton Motor Car Company, San Francisco; Fred S. Smith, Boston; Williamsburgh Auto & Storage Company, Brooklyn, N. Y.; Motor Car Company, of New Jersey, Newark; Thomas & Lowe Machinery Company, Providence; J. H. Brady Auto Company, Detroit, Mich.; Palace Auto Station Company, Hartford, Conn.; R. V. Conneerat, Savannah, Ga.; Citizens Motor Car Company, Cincinnati, Indiana Automobile Company, Indianapolis; Mr. Vernon Car Company, Baltimore; O. L. Barringer Company, Charlotte, N.C.; Colburn Auto Company, Denver, Col.; U. S. Automobile Company, Rochester, N. Y.; Wilmington Auto Company, Wilmington, Del.; Harry R. Hoppes, Westchester, Pa.; Norris Auto Company, Saginaw, Mich.; Youngs & Company, Newburgh, N. Y.; Autocar Sales Company, New York City; Standard Auto Company, Cleveland; Broadway Auto Company, Seattle; August Stocker, Salt Lake City; Cook Auto Company, Portland, Ore. One hundred cars have been reserved for the Philadelphia branch. The factory is now running night and day in order to make prompt deliveries.

NEW AGENCIES ESTABLISHED.

The Auto-Motor Car Company, 804 Sycamore street, Cincinnati, has taken the agency for the Rainier for southern Ohio and eastern Kentucky.

The Newark Rubber Tire Company, of Newark, N. J., has opened a repair department at 266 Halsey street, under the management of John F. Moran.

D. P. Nichols & Company, the newly appointed agents for the Frayer-Miller in Boston, have opened a salesroom in the Motor Mart, Park Square, that city.

The Franco-American Auto and Supply Company, 1404-1406 Michigan avenue, Chicago, has been appointed selling agent and distributor for the Michelin tire for the central and middle west.

The Bonney Motor Car Company, of Kansas City, Mo., has taken the garage at 1112 Locust street, formerly occupied by the Western Automobile Company. The company is Kansas City agent for the Wayne.

The Keystone 'Auto Company, of Pittsburg, Pa., has decided to open a downtown salesroom in the new Fulton building on Sixth street, where it will display its line, consisting of the White, Welch, Ford, and Stoddard-Dayton.

A permanent office has been established in Chicago, by the Willard Storage Battery Company, of Cleveland, to take care of its western automobile battery trade. The office is located in room 1535, First National Bank building.

E. L. DeCamp, of Kansas City, Mo., has taken the sales agency for the entire output of the Mason car, built in Des Moines, Ia. The car is of the double opposed two-cylinder type and has shown up well on the hills of Kansas City.

The Big Four Automobile Company, of Los Angeles, Cal., recently organized by C. S. Anthony, T. Morehouse, and Walter Heist, has secured the agencies for the Marmon and Monarch cars, and opened a salesroom at 110-14 East Ninth street.

Frank Bales has taken the agency for the Cadillac in Kansas City, Mo., and for the present will find quarters near Fourteenth on Walnut street. Later in the season he will erect a roomy garage at Admiral boulevard and Grand avenue, opposite the Midland hotel.

Chas. F. Kellum & Co., manufacturers of the well known Invader oils, have opened a retail branch at 648 North Broad street, Philadelphia, and another one at 715 Seventh avenue, New York City. The home office and warehouse of the company will remain at 128 Arch street, Philadelphia.

Agencies for the Jackson line have been placed by Ralph Temple, the Chicago representative, with C. H. Farnum, Baraboo, Wis.; Manly Brothers, Harvard, Ill.; and Jacob Dreishire, for Sandwich, Somonauk, and Plano, Ill. Thompson & Lipscomb, will represent the Jackson at Lacon, Ill.

The W. & N. Valve Lifter, described in the December 6 issue, is now controlled by the Auto Specialty Company, Chicago, A. J. Jackson, manager. This concern is also the general selling agent for the Standard Lamp Company, and has the Western agency for Gilt Edge polish and other specialties, and is adding new lines rapidly.

Lyons & Company, Grand Forks, North Dakota, have been appointed agents for the Franklin and Cadillac for the northern part of that State. This house handled the Franklin last year, and have recently taken on the Cadillac, also the agency for Indian motorcycles. They do an extensive supply business, covering all the territory west of Grand Forks to Montana.

That individuals and tradesmen may receive prompt attention and deliveries, the Hartford Suspension Company is establishing agencies in various parts of the country. Among those recently established were The Springfield Automobile Company, Springfield, Mass.; the Dominion Automobile Company, Ltd., of Toronto, Winnipeg, and Montreal, for Canada, and the Chanslor & Lyon Motor Supply Company, of Los Angeles and San Francisco, for California.

A new departure by the National Battery Company, of Buffalo, is the establishment of the National Battery Depot, at 271 Michigan avenue, Chicago, with George S. Berger in charge. A complete stock of electric vehicle and sparking batteries and parts will be carried, so that prompt renewals and repairs can be made of any standard sized battery as well as the National. The company's Chicago sales offices will remain, as heretofore, at 450 Old Colony building, in charge of Bertram Smith.

RECENT TRADE REMOVALS.

On January 1 the Chicago branch of the Rainier Company removed to its new salesrooms and garage, located at 1725-7 Michigan avenue.

The Jones Speedometer has moved its Boston office to 109 Massachusetts avenue, near Boylston street. Manager A. L. Lucas will remain in charge.

The Coppock Motor Car Company, recently organized, has purchased the Murillo Motor Car Company and is incorporated at \$100,000. Light and heavy motor trucks for delivery wagons will be constructed, and it is the intention of the company to build pleasure vehicles later. Officers of the

Company are M. Earle Brackett, president; W. M. Myers, vice-president; H. F. Reynolds, secretary; Harry Ward, treasurer; H. W. Coppock, general superintendent.

All manufacturing of Ajax tires will hereafter be done at the Trenton, N. J., plant, the New York factory having been moved to Trenton, where the Ajax-Grieb Rubber Company's assembled plants now are. General offices have been opened at Fifty-ninth street and Broadway, New York City, pending the completion of the company's new offices which will be ready about February 1. The offices of the president and the sales department are now located at Fifty-seventh street.

PERSONAL TRADE MENTION.

At a meeting of the board of directors, held January 2, Nicholas Guy Roosevelt was elected treasurer of the Dragon Automobile Company, of Philadelphia.

Owing to press of other business, O. E. Seager has retired as vice-president of the Jackson Auto Company, of Kansas City, Mo., although retaining his stock. His place will shortly be filled.

Joseph F. Gunther, manager of the Chicago branch of Thomas B. Jeffery & Company, is enjoying a three weeks vacation in Mexico. He will journey as far south as the capital city before he returns.

Raymond Martinez Hernandez has been appointed western agent for the Continental Caoutchouc Company, and will have charge of all the territory west of Chicago, with the exception of California.

H. F. Siegrist, formerly treasurer of the Swinehart Clincher and Rubber Company, of Akron, O., has severed his connection with that concern, and is succeeded by Frederick Boron for the unexpired term.

J. A. Swinehart, of the Swinehart Clincher Tire and Rubber Company, of Akron, O., who has been in Europe since the middle of December, is expected to return about January 15. He reports a giant stride in the Swinehart tire outlook abroad.

The latest accession to the ranks of the Dragon Company is Al Poole who is best remembered as the mechanic who rode with Joseph Tracy in all his Vanderbilt races. Poole is an expert mechanic and tester and will prove a useful addition to the Dragon forces. He recently rode with Joe Tracy on the alcohol test of the Dragon car held on New Year's Day, and is now working with the latter on engine tests.

Recent changes in the personnel of the managers of the branches of the Diamond Rubber Company, include the appointment of C. H. Smith as manager of the Chicago branch at 1523-31 Michigan avenue, and W. P. Cronin as manager of the New England branch at 174 Columbus avenue, Boston. Both Messrs. Smith and Cronin have had extended service with the Diamond company as salesmen in the territories over which they are to preside, and are thoroughly familiar with local conditions and requirements.

NEW TRADE PUBLICATIONS.

From the Outcall Manufacturing Company comes a colored tear-off calendar illustrating a familiar roadside scene in summer.

"Trophies Won" is the frontispiece of the Jackson Automobile Company's catalogue describing the firm's different models for 1907.

By text and design the brochure issued by P. M. Hotchkiss, 4021 Lake avenue, Chi-

cago, shows the vibrations of a car with and without the Hotchkiss anti-jolt device.

"Just a Moment," a scene at a railroad crossing, is the catcher with which S. F. Bowser & Co. holds up the motorist for a second to instruct him in the proper methods of handling and storing gasoline.

The Corcoran Lamp Company's tear-off calendar will certainly be retained and hung up in every office in which it is received. "The Signal," the central embossed and colored design, is a highly artistic piece of work.

Tinkering is not recommended, but the Pope Motor Car Company believes that any intelligent man can take care of Pope-Waverley electrics with a little instruction, and has issued a booklet of instructions to meet this end.

Light is cast on the subject of automobile and portable reading lamps by the Avery Portable Lighting Company's booklet just received. It shows how the Auto-gas tanks will light up the road before you or prove of use in country homes.

Elegance has been sought and attained in the Detroit Steel Products Company's hanging calendar for 1907. On a plain brown ground a maiden fair and wondrous beautiful presents the products of a fruitful autumn. Embossed and artistically colored, the calendar will rank among one of the best of the season.

A very comprehensive and practical automobile handbook, in the German language, has been published by M. Krayn, 11 Kurfurstenstrasse, Berlin, under the title "Automobiltechnischer Kalender und Handbuch der Automobil-Industrie fur 1907." The book was compiled from all available reliable sources by E. Rumpier, a well-known Berlin engineer, and explains and illustrates the construction of gasoline, steam and electric automobiles and their component parts, and also takes up in detail the subject of motor boats. Instructions are given for caring for automobiles of various types and practical hints given on their care and maintenance. The book includes a calendar, with blank spaces for notes, and a series of useful mathematical tables for handy reference; also rules for making various calculations required in automobile and motor work.

A SIMPLE FORM OF CAR.

The Auto Buggy presented by the Success Auto Buggy Manufacturing Company, of 530-540 De Baliviere avenue, St. Louis, Mo., is an automobile in its most simplified form. Briefly, it consists of a buggy carried on a V-shaped steel angle-iron frame with 37-41 or 40-44 wheels, either rubber or steel shod. The motor is a two-cylinder air-cooled type, 4 inches bore by 4 inches stroke, with fan in fly-wheel and positively balanced to avoid vibration, and is carried on the side of the buggy, transmitting power to rear wheels through a side chain without the intervention of a differential. Planetary transmission is employed with connecting rods and levers which are operated by pedals on the inside of vehicle. There is a 14 inch stationary steering wheel guaranteed not to rattle. Dickinson ball-bearings are employed for the road wheels, and are guaranteed absolutely water-tight. The importance of this cannot be overestimated for a machine employed on rough work over wet and sandy roads. The chief feature of the buggy, however, is the direct transmission, without differential. The invention of John Clark Higdon.

INFORMATION FOR AUTO USERS.

Quick-Acting Wrench.—There is a vast amount of time lost in adjusting monkey-wrenches, and there are plenty of men who have done this by the roadside on a cold day who have wished for something less tedious than the apparently endless screw arrangement. To meet this demand the York Electric and Ma-



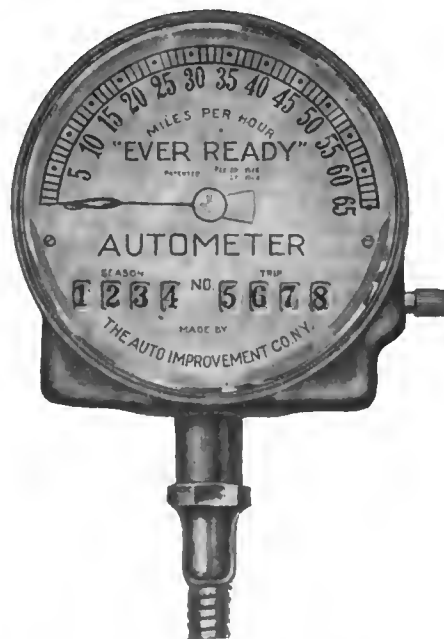
YEMCO QUICK-ACTING WRENCH.

chine Company, of York, Pa., has brought out the Yemco quick-acting adjustable wrench. In general appearance the Yemco wrench is much like the well-known adjustable wrench; but in the sliding jaw is a little button. Press this button and the jaw can be slid to any desired point, and on releasing the button will be held there securely. One advantage of this wrench is that it can be manipulated with one hand. It has another important feature. The jaw can be placed in any position, and its position can be changed by the most minute degrees—there are no fixed points of engagement. The worm which takes the place of the usual thumb worm turns easily and automatically as the jaw is moved up or down.

Quad Ignition Timer.—The ingenious timer illustrated herewith is the product of the Quad Manufacturing Company, of Columbus, O., and embodies a number of features that make for durability and accuracy. The illustration is so clear that the construction is easily understood. The shaft has two bearings, front and back, so that there is no tendency to bind and wear unequally. The peculiar form of the shaft, cut away at one side, permits the use of a very large roller, of hardened steel, running on a hardened steel pin. This insures long life to the

very large indeed for the work they have to do. The dome-shaped cover is of polished aluminum and carries the front bearing; the back piece is of gray iron, and in it is formed the main bearing. Insulation is of fiber and the contact blocks of steel; the shaft, carrying the steel roller, is of bronze. The arm carrying the roller is on a pivot and the rounded face of the roller is pressed against the contacts by a spiral spring attached to the opposite end of the arm. A felt oil retainer keeps the oil where it belongs and excludes dust. To remove the cover it is not necessary to take out the two retaining screws; they are merely loosened and the cover slightly rotated, when it can be removed, the screw heads passing through holes cut for the purpose.

"Ever Ready" Autometer.—There is a marked tendency among automobilists to clear the dashboard as much as possible. Thus the Ever Ready, combining minute and second clock, speed indicator, and sea-



FACE VIEW EVERY READY AUTOMETER.

son and trip record is likely to meet with favor among up-to-date automobilists. The instrument has a 4 inch dial, figures are large, distinct and proportional and can be read at a glance from the back seat or from any other part of the car. The mechanism and governor, working on the principle of centrifugal force, are theoretically and practically correct. There are no soldered joints or loose pieces and the apparatus is inclosed in a solid bronze dust and water-proof shell. The 65 miles universal indicator above described, complete with flexible shaft, gears, etc., is listed at \$75 by the Auto Improvement Company, 316 Hudson street, New York. Another instrument handled by the same company, without the clock, registers up to 9,999 miles for the season, and 999-10 miles for the trip, and is sold at \$70 complete. All Ever Ready speed indicators are mounted on patent adjustable brackets, allowing the instrument to be turned to right, left, face up or down, as may be desired by the operator.

An Effective Non-skid.—The Midgley Wire Grip is not a new tire, as some have seemed to think, but an effective non-skid arrangement, originated by The Hartford Rubber Works Company, consisting of five endless coils of spiral wire embedded in the flat tread a short distance from and parallel with each other. In practice each



MIDGLEY WIRE GRIP TIRE.

of these coils presents a minute wearing surface flush with the outer rubber in the tread. Now the more the tire wears down the better the non-skid device works, because each one of the coils is practically an inverted staple, taking direct and positive hold of the road or street surface over which it passes.

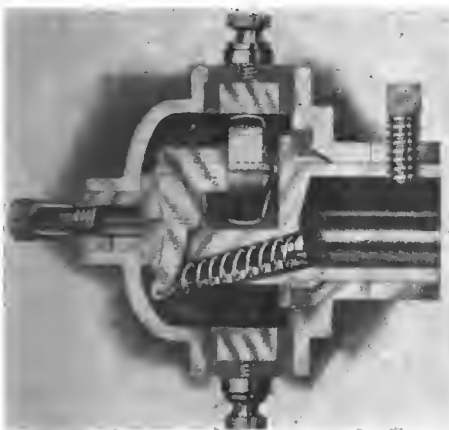
This is an absolute preventive of side-slipping under any and all conditions. Furthermore, the wire coils are so arranged that they have a slight co-operative action with the rubber, and thus subtract nothing from the resiliency of the ordinary pneumatic. While this construction prevents skidding, it adds to the "life" and wear of the tire. A Hartford Dunlop, or Clincher, fitted with the Midgley Wire Grip, is sold at an average advance of 25 per cent. over the plain casings.

The Hartford Rubber Works Company now offer to American owners of high-grade foreign cars Clincher tires made in millimeter sizes, exactly fitting the rims on all types of foreign cars.

For the first time non-skid devices are available in millimeter sizes incorporated into the tread itself. At the present time they are prepared to supply 12 different sizes but their factory is equipped to turn out any others for which sufficient demand is had.

The dimensions of these tires are not approximate, but exact. They will fit perfectly the rim on foreign cars, requiring no costly or time-consuming delays when that equipment is decided upon.

A Novel Guideboard.—It is pretty hard lines to find a guideboard so faded out that the lettering is almost invisible, especially if one is in an automobile and the weather is bad and the light failing. It's a case of getting out in the mud or snow and going up to the board to puzzle out the dim directions. A new kind of guideboard has been invented by W. P. Harmony, of 627 Franklin avenue, Sidney, O., to avoid this trouble, and it is called the Fadeless Guideboard. The



CROSS SECTION QUAD IGNITION TIMER.

wearing parts, as the roller rotates at comparatively low speed. Moreover, there are special means for constant lubrication, a dustproof oil hole opening into a little reservoir from which oil flows through suitable ducts to the bearings. While the Quad timer is of very compact build, the roller is of maximum size and the shaft and its bearings are

letters are formed by series of cup-shaped indentations in the wood, painted a color contrasting with the paint on the rest of the board; the hollows hold the paint and protect it from the effects of the weather. Even without any paint at all the inventor states that these signs are perfectly legible, and that nothing short of the destruction of the board will deface the inscriptions. The wood used is cypress, and boards are sent out with lag screws for attaching to posts. They cost no more than the ordinary type. Protecting ledges are placed at the ends and top.

Stewart Speedometer.—As a proof of the care which is bestowed on the construction of the Stewart Speedometer, a five years' guarantee is given by the manu-



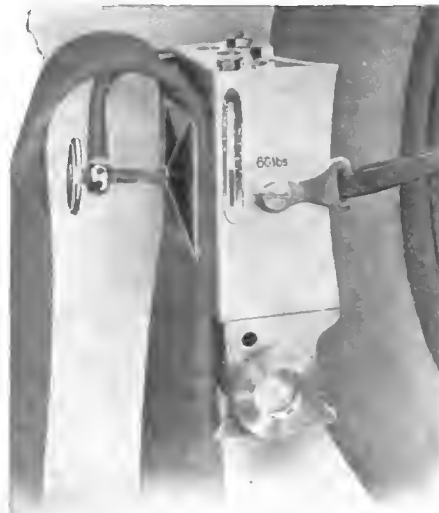
FRONT VIEW OF THE STEWART.

facturers, the Stewart & Clark Mfg. Co., 69-71 Wells street, Chicago. Having no fragile mechanism, no delicate hair springs, brass sliding parts, or soldering, the speedometer can be relied on to indicate accurately speed and distance traveled over all kinds of roads. A feature of the Stewart apparatus is a flexible shaft made of steel links that hook one into the other without riveting or splicing and which is guaranteed not to crystallize or break. While practically indestructible, in case of accident it can be easily repaired in a moment's time. Extra hooks are supplied and it requires no tools to make the repair. The shafts are mounted on ball bearings of extra quality and finish. Pivots and other bearings are mounted in hardened steps, and both steps and pivots are highly polished to reduce friction. All swinging members are mounted on long hardened pivots with step bearings. The Stewart universal joint allows the flexible shaft to hang at any angle; it obviates short bends and prevents the shaft from crystallizing and breaking.

Double Swivel Vise.—It is often necessary, when the automobilist is so unlucky as to be forced to make roadside repairs, to do all kinds of stunts to hold a bit of metal steady enough to file; and it is a very difficult matter to file off more than a very small amount of metal while holding the work by hand. Some kind of a vise would be just the right thing, and the Pittsburg Automatic Vise and Tool Company, of Pittsburg, Pa., has brought out a vise exactly suited to these conditions. To the running-board or step of the car is attached a small and unobtrusive base, which is a fixture; and

the vise is attached to this, when it is to be used, and at other times is safely packed away in the toolbox. There is no complication about the insertion of the vise into the base—it is simply set in the socket, in which it is perfectly free to turn in a complete circle. As soon as the jaws are tightened on a piece of work, however, the vise is automatically clamped in its base and cannot move. Release the work and the vise is again free to swivel. There is another swiveling motion. The jaws can be swung clear around on the axis of the screw, and, as in the case of the horizontal movement, the tightening of the jaws on the work clamps the swivel automatically. These movements make it possible to get the work into almost any imaginable position for convenience of access in filing and so on. The vise has 13-4-inch jaws, opening 31-2 inches, weighs 31-2 pounds and is nickel-plated. The parts subjected to stresses are of alloy steel and the screw is a steel forging; all parts are interchangeable. The company also makes shop vises of all sizes on the same principles.

New Vulcanizer.—Engine troubles in these days are rare, but tire difficulties still remain with us. With the Ever Ready Vulcanizer, controlled by the Auto Improvement Company, 316 Hudson street, New York City, the automobilist is able to quickly and easily make any and all kinds of repairs to inner tubes, repair all cuts, sand blisters, and sections of tread, without removing the shoe from wheel. The distinguishing feature of the Ever Ready system of vulcanizing consists in the use of a special rubber compound, which is used



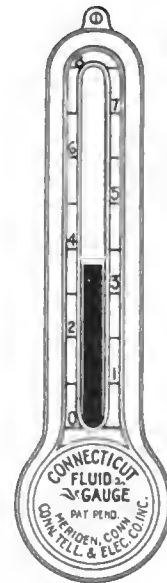
EVER READY VULCANIZER.

to fill in all punctures, blow-outs, cuts, or sections of tread, which have been removed or become detached from the canvas, and in all cases dispense with the use of patches and with the reuse of any of the old rubber, which has been removed, hence the damaged portion is in every case provided with absolutely new rubber.

The apparatus is made of tempered aluminum, is very portable, weighs only 31-2 pounds and is provided with a full set of tools, materials, book of instructions, and a fiber carrying case.

A Handy Gasoline Gauge.—The Connecticut is a little instrument to be screwed on the dash in front of driver and indicates the amount of gasoline in the tank by a column of colored fluid ascending and des-

cending between a graduated scale. In principle it is simple, the gauge consisting of a reservoir to which is connected a small pipe about one-eighth of an inch in diameter, the other end of the pipe being connected to a proportioned tube which



CONNECTICUT TANK GAUGE.

passes through the top of the tank. In the gauge proper there is a glass tube which passes down to the bottom of the reservoir in the gauge. When the fluid in the gasoline tank is raised it creates an air pressure in the tube mounted therein, which is transmitted to the surface of the liquid in the gauge reservoir. As the supply of gasoline decreases the air pressure diminishes and a corresponding fall in the liquid ensues. The gauge is very easily fitted, the connection to gasoline tank being a semi-flexible seamless drawn tube one-eighth inch diameter soldered into tank. It will be noted that no gasoline passes into the gauge itself, consequently there is no danger from this source.

Handy Electrical Contrivance.—The American Electrical Novelty Manufacturing Company, 304-8 Hudson street, New York, has produced an ingenious and simple battery wire connector, the nature of which will be readily understood on reference to the accompanying right-hand cut.

To attach the wire is but a moment's work; for it to disconnect owing to vibra-



SELF-ADJUSTING WIRE CONNECTION

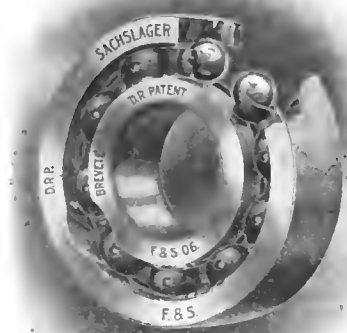
tion or road shocks, is practically an impossibility. Several size Ever Ready cells are made. Style K, 3 x 7 inches, of 27 to 30 amperes, and style J, 2 1-2 x 6 inches, of 22 to 25 amperes.

German Ball Bearings.—Annular and thrust bearings manufactured by Fichtel & Sachs, Schweinfurt A. M., Germany, will occupy space 27 at the Madison Square show. F. & S. bearings have a high reputation in Europe, being employed by such firms as Daimler (Mercedes), Darracq, Fiat, Isotta Fraschini, Adler, Opel, Benz, English Daimler, Napier and Wolsley. Though only recently introduced into the States, they are being extensively adopted by American constructors. The Fichtel & Sachs annular ball bearing consists of two concentric rings of races, grooves in the races, steel balls running in the grooves, and a cage (made in two sections and

displacement, the depth of the race grooves is much greater than the depth of the oblique cuts, and every ball is enclosed in a separate pocket, so that no harm can result from the accidental breaking of one.

An English-built Speed Indicator.—The speed indicator manufactured by S. Smith & Son, Strand, London, and enjoying a high reputation in England, France and other European countries, are now being offered to the American public. A very complete series is produced by the firm, ranging from the simple speedometer indicating only speed and mileage, to more elaborate apparatus, combining clock, speed, trip and season mileage, and electric indicator for communicating orders to driver. This latter is a particularly handsome combination and does credit to any dashboard. A great feature of the instrument is the specially light construction made possible by a new method of springing the governor. By this arrangement the instrument can be supplied in standard form, it only being necessary to alter the position of the pulley upon the metal disk attached to the wheel to obtain the necessary adjustments for the varying sizes of wheels. The speedometer is a most satisfactory one to clock, for it is practically suitable for every size of wheel and every make of car without alteration. During November, 1906, Messrs. S. Smith & Son received orders for 1,671 of their instruments. Their present output is 120 per week, but it will be increased to 200 shortly.

ratchet bar is of strong steel with milled teeth. A lifting capacity of two tons is guaranteed. By reversing a cam at one side of the jack with the fingers a reverse action is obtained that permits the axle to be lowered by an easy pumping action of the handle. The entire out-



F. & S. BALL BEARING.

permanently joined together) containing and positively separating the balls equidistant and keeping them in perfect alignment. The bearing is of steel of an exclusive analysis. Each bearing has a complement of more balls than will fill one half its circumference. The rings, or races, are each provided with obliquely cut grooves which, when brought into proper relation, will permit of the introduction under pressure of additional balls. When working under a strain the balls cannot escape from the race in reverse action to their introduction, for the circumferential action of the balls is opposed to the direction of one of the oblique grooves, the permanent alignment provided by the cage prevents

Enlarged Standard Jack.—The No. 1 Standard automobile jack has been greatly improved for the season of 1907 by an increase of nearly one-half in the size and by a change in the ratchet action. The area of the foot or base has been increased to nearly double the old size, so that there is no difficulty in making the jack stand up, and the yoke has also been enlarged to 2 1/4 inches wide, so that it will hold the axle securely. The Standard is a single-acting jack, the ratchet mechanism working only on the down stroke, when the operator can bring all his weight to bear upon the handle. A change in construction makes the leverage much more effective, so that the heaviest car can be raised without undue exertion. The



IMPROVED STANDARD JACK.

put of the No. 1 Standard jacks, which retail at \$4.50 each, is controlled by the Motor Car Equipment Co., 55 Warren street, New York City.

RECENT INCORPORATIONS.

Garrett Automobile Company, Garrett, Ind.; capital, \$10,000. Directors, Charles J. Rollins, Charles Colgrove and William Mitchell.

Motor Car Renting Company, Boston, Mass.; capital, \$10,000. President, F. E. Litchfield; treasurer, E. S. Litchfield, Brookline.

Newton Garage and Automobile Company, Portland, Conn.; capital, \$10,000. President, N. Clifford; treasurer and clerk, E. C. Verill, Portland.

Portland and Rockland Automobile Company, Portland, Conn.; capital, \$10,000. President and treasurer, J. A. Lester, South Thomaston.

A. B. C. Auto Buggy Company, St. Louis; capital stock, \$40,000. Incorporators, A. B. Cole, Robert L. Steele, Jr., and F. F. Stevens, 150 shares each.

Austin Agency, Inc., Boston, Mass.; capital, \$10,000. To make and sell autos and vehicles. President, F. E. Litchfield; treasurer, E. Litchfield, Brookline.

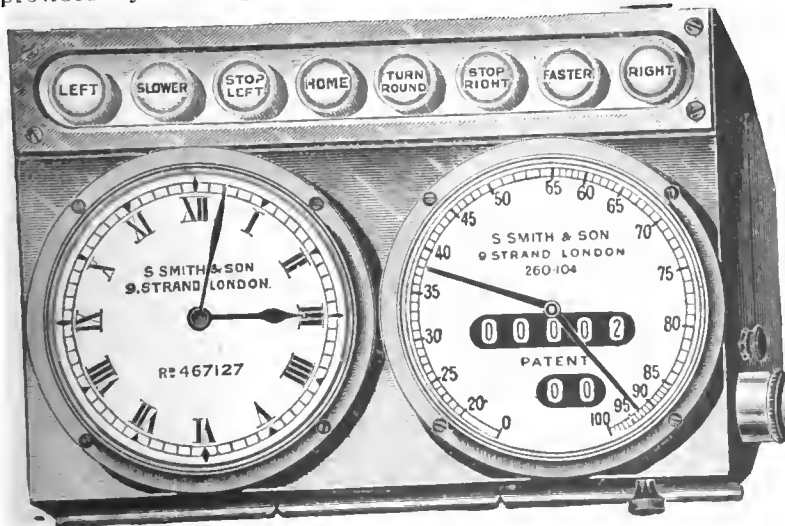
The Rivers-Jacoby Automobile Company of Toledo, Toledo, O.; capital, \$25,000. Directors, W. E. Jacoby, A. F. Nicklett, A. D. Rivers, C. G. Smith and E. E. Davis.

The Citizens' Motor Car Company, Cincinnati, O.; capital, \$100,000. Incorporators, Briggs S. Cunningham, H. E. Breneman, J. M. Richardson, J. E. Thomas, and Robert Ramsey.

Southern Automobile Company, Limited, New Orleans; to deal in and repair automobiles; capital, \$15,000. Incorporators, L. Stortz, Jr., George C. Escoffier and Solomon C. Meyer.

Auto Appliance Company, East Orange, New Jersey; capital, \$150,000. To manufacture motor vehicles, etc. Incorporators, C. L. Beck, C. O. Geyer and F. O. Ferguson, East Orange.

Model Automobile Company, Peru, La.; capital, \$50,000. To manufacture automobiles, automobile parts and supplies. Incorporators, Albert Kittner, Milton Krauss, W. S. Muer and H. P. Sullivan, directors.



COMBINED SMITH CLOCK AND SPEED INDICATOR.

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Economy, Efficiency and Safety

¶The NATIONAL Gasoline Storage System is the most economical, because it entirely eliminates evaporation and waste of gasoline. ¶It is the most efficient because the NATIONAL Pump discharges gasoline at every movement of the crank, and is always ready to operate. ¶It is the safest, because it meets ALL of the requirements of The National Board of Fire Underwriters.

Ask us for Catalogue

The National Oil Pump & Tank Co.

DAYTON, OHIO



THE AUTOMOBILE

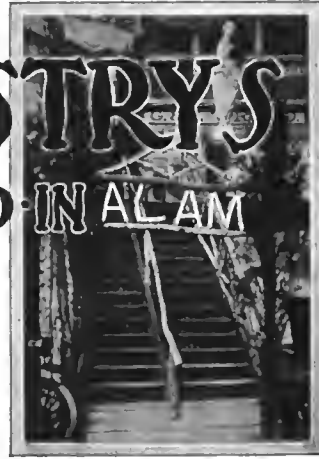
VOL. XVI.

NEW YORK—THURSDAY, JANUARY 17, 1907—CHICAGO

No. 3

AN INDUSTRY'S PROGRESS AS TOLD IN ALAM SHOW

THE second show of the Association of Licensed Automobile Manufacturers, and the seventh affair of the industry in Madison Square Garden, tells unmistakably, substantially, and artistically its own story of gratifying and unexampled progress. It is an exhibition that bears all the imprints of a successfully established in-



dustry—an exhibition that yet betrays the earmarks of youth and still gives evidence of its lusty growth. It should be mentioned here, thus early in the report of the A. L. A. M. show, that its experienced pioneers do not compose all the automobile makers of the country, for scarcely a month ago the American Motor Car





PRESS AGENT JERVIS,
Who "painted [the] lily" and
"gilded refined gold."

Manufacturers' Association supplied the greater part of another notable exhibition of the industry which the Automobile Club of America conducted in the Grand Central Palace. In realizing the magnitude of American automobile manufacture, the total must be that of two shows held in the two largest buildings of the metropolis; and in this connection comes the wish for a mammoth structure that would house all the makers and present the American show in such manner that it would surpass the famous Paris Salon, with its elaborate

decorations and roomy spaces. And the Salon includes the makers not alone of France but of Italy, Germany, England, Belgium and Switzerland; therefore the American magnitude excels that of any other single country.

New York has had six automobile shows in the Garden before, but the A. L. A. M. committee, consisting of Chairman George Pope, M. I. Brock, C. R. Mabley, and Secretary M. L. Downs, completely met the metropolitan appetite which had been whetted by the previous events of like character. Great things had been promised for this 1907 affair, promised early in the season before its predecessor had totally faded from view, and so something which would totally eclipse everything that had gone before was looked forward to.

Nor did the realization fall short in any detail of fulfilling expectations. Promptly at 8 o'clock, Saturday night, the show, which had been open for two hours before that time—if the number of visitors interestedly taking in the details of the many cars exhibited may be taken as a criterion—was formally thrown open to the public. Nearly an hour later, to add éclat to the occasion, came the representatives of foreign powers, among them being Baron Mayor des Planches, the Italian Ambassador; M. de la Fosee, counsellor of the French Embassy; Lieutenant Commander de Blanpré, naval attaché of the French Embassy, and M. de Thal, the Russian Ambassador. But the thousands who had come to pay homage to the Automobile and who were content to take their turn in slowly circulating around the all too narrow aisles in order to get an opportunity to see the different exhibits, did not have to be told that the show officially was "open." Their arrival had opened the exhibition.

Despite the gloomy and rain-soaked condition of the outer world, the Garden was a picture of many colors that proved too strong a drawing card for the weather man to counteract, and thousands poured in through the large double doors—hesitated momentarily to fully take in the details of the magnificent conception that towers twenty feet above the floor, and went either side of it to fulfill the purpose of their mission, the splashing of the fountain forming an accompaniment to the myriad footbeats. And the sight that greeted the eye was one of completeness in detail, one that lacked nothing to make it complete, not a gap here and another there, but long lines of polished chassis and complete cars, with nothing to indicate their identity but the inconspicuous signs of their makers above them, the cars and the panorama of Swiss scenery behind them blending so completely as to make it seem as if the cars were in their natural element and lacked nothing but drivers. So far as the crowd itself is concerned, it only remains to say what has been said of the attendance on opening nights for the past two or three years—it was a greater and more enthusiastic crowd than has ever before lent its aid to inaugurating an automobile show.

If the success of such an event is to be judged from the beauty of the picture presented by the tout ensemble, and by the size of the aggregation that comes to view it, then indeed is the "Seventh Annual Show" the greatest of its kind, for neither in

the elaborateness of its conception nor in completeness of advanced preparation, despite the vast amount of work that had to be condensed into a very short space of time, was there anything left to be desired. Saturday night was not a sort of preparatory view of what the show would be like later in the week, as it has been in former years, but it was a revelation of the complete whole, uncovered as it were by a sweep of the hand. The background of bare walls and columns which have formed the foundation of the setting for the automobile for seven years past are entirely lost on the present occasion in the profusion of decoration. From the thousands of yards of soft yellow that shut out the girders of the building from view, and behind which a myriad of incandescent lights twinkle, to the smallest section of canvas depicting Alpine scenery that serves to cover the walls, not a spot of the bare brick and iron have been left uncovered, the whole blending softly at every turn into a huge panorama that is complete from whatever point it may be viewed. And the realism is greatly enhanced by the effective use of rustic decorative work, which, though employed in large quantities, is as a whole subsidiary to the scheme of ornamentation and does not intrude itself upon the attention.

As for the cars themselves—and after all they constitute the jewels for which this extremely elaborate and ornate setting has been prepared—it is difficult to know where to attempt to undertake a description of the achievements they represent. Occupying the main floor of the large arena are the products of firms whose names have been closely linked with the progress of the automobile in this country ever since such a thing as an automobile industry had its inception—in fact, for a long while they were the American automobile industry. Grouped with them are a number of Europe's most noted makers, so that a comparison of the flower of automobile productions of standards obtaining on both sides of the Atlantic may readily be made—a comparison, by the way, that redounds to the credit of the American maker. Here, in all, are spread out no less than forty-seven groups of cars—the products of some of the largest and best-known factories in the world—in short, a very large portion of the real bone and sinew of the automobile industry the world over. The demand for space in which to show those same products has become so pressing that even the heavy vehicles are no longer confined to terra firma, but some have mounted heavenward to an elevated platform, specially constructed for the purpose, despite their bulk and avoirdupois. Where formerly the accessory maker held sway the great spread of cars is continued.

On the level below the main floor, the horseshoe circuit of the basement, which erstwhile dingy abode of bare brick walls and otherwise uninviting appearance has been transformed so that even those most familiar with it would fail to recognize it at first glance. Holland scenes form the basis of the decorative scheme, and they cover the long walls in panels stretching from floor to ceiling.

In the exhibition hall still another plan of decoration has been carried out, and here the electrics hold forth in all the stately dignity of their luxury of furnishing and lack of mechanism to intrude itself on the vision.

Above them in the concert hall the scene is again transformed, as are also the subject of the exhibits for which the new color scheme

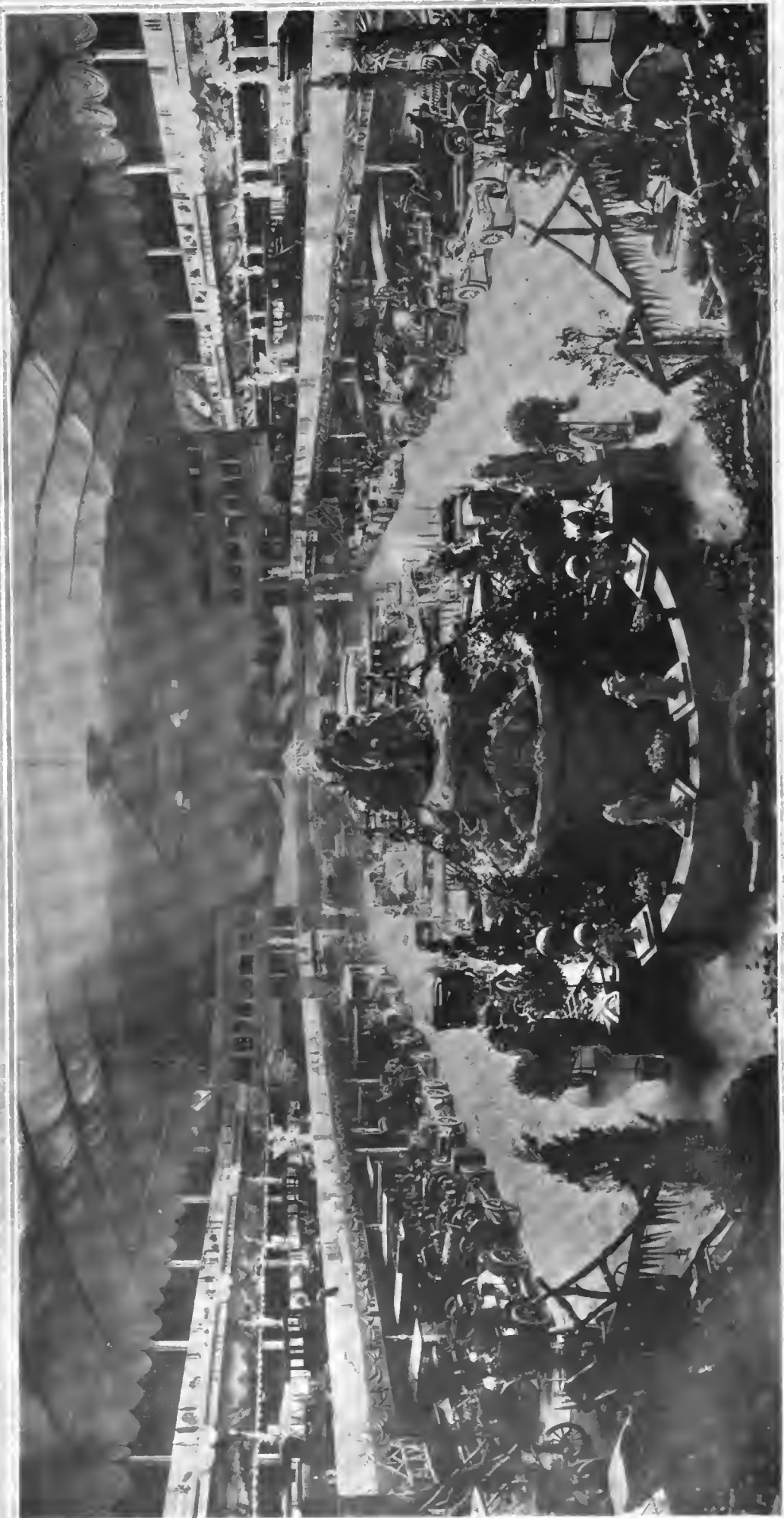


THE MADISON SQUARE GARDEN.

forms a setting. Here an oriental blending of blue, red, and green forms a background for dozens of exhibits of the materials that go to make a car.

Above the elevated platform that has been pressed into service this year to accommodate an increased number of cars, and separated from it by but a step or two, is the mezzanine floor that holds the first of that seemingly endless array of exhibits of accessories. Tier above tier they stretch around the entire circuit of the large building in uninterrupted rows. Taken all in all, it is an achievement in the successful accomplishment of which its sponsors may well take pride.

As a standard by which to judge the success of the show from the financial point of view, it may be added that not even the call for a double admission price, coupled with the uncertain weather which continued over Tuesday, was sufficient to cause any marked falling off in the attendance. And that is saying a great deal, for, before the lights are turned on, the Garden is a gloomy enough place on a dark and muggy midwinter day. Still the visitors came to see and admire, and in the evening there was the same crowd of interested spectators taking in the details of the many cars and circulating among the numerous lesser exhibits. Whether the doubling of the admission price had the desired effect of thinning the crowd down to those who numbered a greater proportion of prospective purchasers than has been the case on ordinary nights, as was presumably the intention of the management in making this innovation, cannot be said, but, judging from appearances, it did not have an unusually perceptible effect in lowering the attendance.

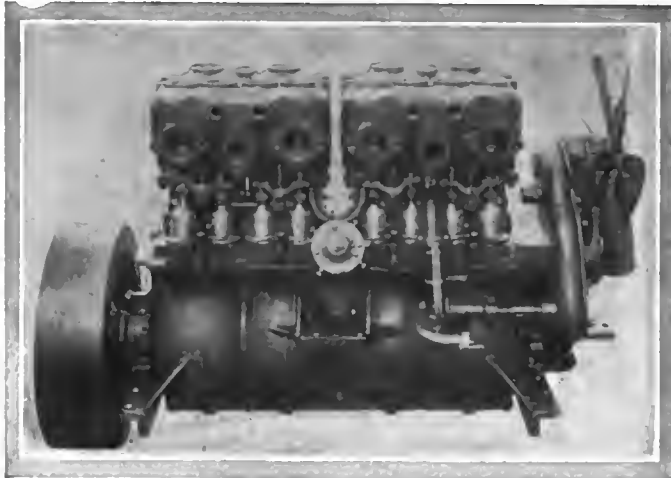


NEVER BEFORE HAS MADISON SQUARE GARDEN BEEN GIVEN SUCH AN ELABORATE DRESS AS FOR THE SECOND SHOW OF THE ASSOCIATION OF LICENSED AUTOMOBILE MANUFACTURERS.

THE AMERICAN CAR AS PRESENTED BY THE SHOW

By C. B. HAYWARD.

AMERICANS are prone to exaggerate the merits of anything that bears the stamp of the eagle; much given to over-vaunting their prowess and their achievements in every line of endeavor, whether it be one they have had long experience in, or something of recent adoption. Such is the trend of foreign opinion of the things that are said of the products sent broadcast from



EXHAUST SIDE NEW WINTON 40 HORSEPOWER MOTOR.

this country to other markets. Thus the American maker is more than proud of the American automobile and with good reason, while the foreigner, on the other hand, is given to belittling its design, its appearance, the materials that enter into it, and its capabilities, usually concluding with the consoling statement that, in the fullness of time, the American maker will learn how to build automobiles. Truth is seldom a matter of extremes and the present is no exception to the rule, so that the status of the American automobile is neither that of the invisible pinnacle of unapproachable superiority, nor the low level of mediocrity. In view of the stock consolation offered by alien and not wholly disinterested critics, it may well be asked: Has the American maker learned to build automobiles?

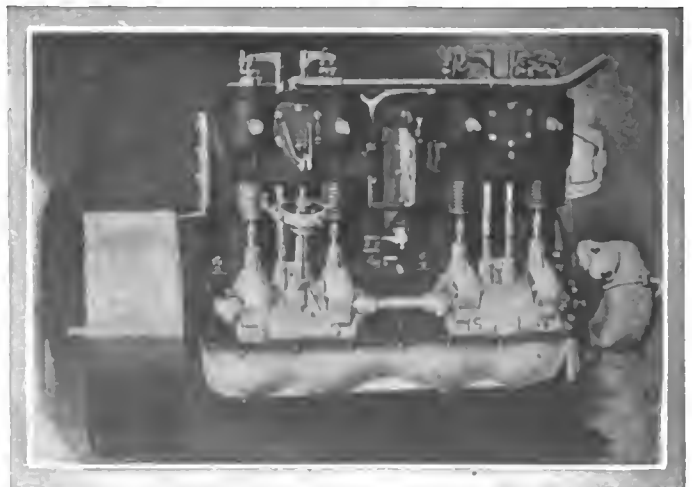
With the brave showing spread out in the Garden during the present week, it has not been difficult to formulate an answer. Giving all due credit to the sources from which he has borrowed, and at the same time admitting candidly that he was following the wrong road for some time at the outset, the American maker is certainly entitled to say that he has not alone learned his lesson, but outgrown his teachers. Starting with the very foundation of every mechanical construction—the materials—it does not require any lengthy explanation to impress upon the most casual of observers that this most essential requisite of successful automobile building has been given the attention that its importance deserves and that the metals which enter into the make-up of the American automobile are those which long investigation in the science of metallurgy has shown to be the best adapted for the purpose. The steels that enter into the frames, axles, transmissions, and minor parts and the iron used in casting the cylinders have been selected for those qualities which analysis and experience have shown to be requisite if that high degree of efficiency and smoothness of running, which are the aim of every builder of high grade cars, are to be attained.

Detailed Execution and Workmanship.

America has long stood preeminent as the home of metal-working machinery of the most advanced type, as well as methods of operation and shop practise best calculated to produce the desired

result, so that in taking up the manufacture of the automobile the domestic maker was but turning his talents to a rôle in which he was already well-versed. It is a matter of common knowledge that large quantities of machine tools of American origin are employed in the manufacture of cars abroad, so that in this respect at least, the American maker had the start of his over-sea competitor from the beginning. To realize that he has fully profited by his advantage, it is only necessary to note the quality of the workmanship that characterizes the American car as represented in the show—not the polished exhibition chassis which is a mechanical work of art requiring several times as much pains and labor as are expended on the ordinary stock car for its execution, but the car which is delivered to the purchaser. Clean, smooth cylinder castings, free from flaws of any kind, accurately turned flywheels, close-fitting gear and crankcases—an ensemble of painstaking design that would have elicited unbounded admiration could it have been suddenly revealed a few years ago alongside the work of that day, but which in the meantime has come to represent a standard of finish common to even the lowest-priced cars, so that its prevalence no longer arouses any comment.

This is but the first impression of a general observation—looking a little further is productive of revelations that only the experienced eye, familiar with what has gone before, can read aright. Slipshod methods have gone down before the steady march of improvement, and what were at best but makeshifts borrowed from past experience in which conditions met with in automobiling had played no part, have had to give way to methods of accomplishing the same thing in a manner specially designed to effect it in view of the service it will be called upon to render. The cotter pin, for instance, was an effective fastening on small parts not subject to unusual stress or vibration, and for that purpose it found a place on the automobile wherever it could be employed. As an example, it may be cited that the old-time valve spring retainer was a split or cotter pin and a common iron washer taken from the stock of the hardware dealer. Now a specially designed retainer with a recessed face to hold the spring properly constitutes a form of fastening, that it takes but a glance to see was made to do the work required of it. The thought of a camshaft with eight integral cams would have overcome the average maker a few years ago; its cost would have been prohibitive and the necessity of such refinement in manufacturing methods, in order to obtain greater accuracy and durability, would have appeared to be a waste of money. Cams were made separately and pinned in place; now the shaft and its cams are a single piece and the former are ground to a minute fraction of an



COLUMBIA 40-45 HORSEPOWER MOTOR FOR 1907.

inch, after which the faces are case hardened. Instances of the same nature might be multiplied indefinitely.

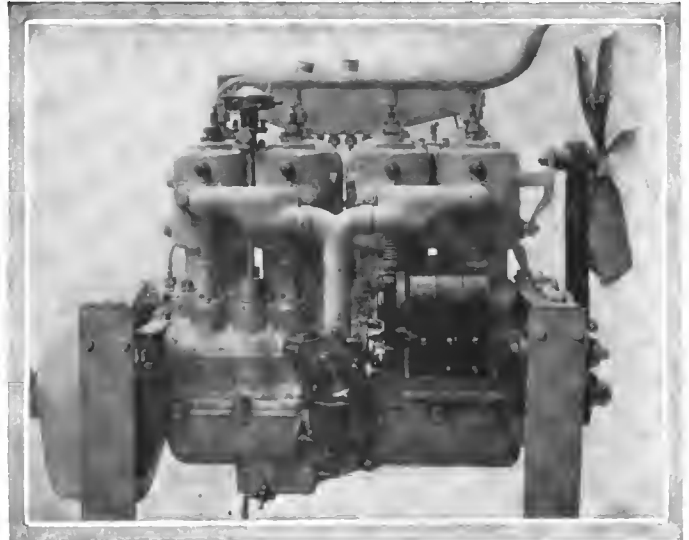
Standards of Motor Design.

It is probably useless to expect that any large body of designers will ever be thoroughly in accord on any subject involving so many opportunities for detailed differences as that of motor design, though years of experience have resulted in evolving a type of construction that is followed so closely in such a large number of instances as to warrant being termed current practise in this respect. Take the matter of cylinder casting, for example, and all the cars in the show may be immediately divided into two representative groups, those adhering to the twin type and those favoring the independently cast cylinder. There are so many things to be said in support of either method that when the advantages and disadvantages are to be weighed in the balance it becomes extremely difficult to differentiate between them. The merits and demerits being thus evenly apportioned, the number to be found ranged on either happens to depend upon which was chosen in the beginning. The matter of valve-placing is another and probably the most prolific source of difference in the case of the different designers. It would be difficult to state just what proportion of them adhere to the opposite disposition of this important essential of the motor, using deep pockets in connection therewith, and how many favor the concentration of the valves on the same side, without taking a detailed census of the cars shown. The matter is further complicated both by those types in which both valves are centered in the head and the entire interior of the cylinder is machined, which is a characteristic of air-cooling practise, and those in which the exhaust valve is placed in the center of the head and the inlet retained at the side.

This, of course, is still further influenced by the type of valve-operating gear employed, and though the majority of designers have retained what may best be termed the standard method as it is represented by far the greater of makers, there is a tendency away from it. This is the direct lift, or push rod, which is a feature of probably 90 per cent. of all the cars shown, whether American or otherwise. In some instances, it has been modified by the interposition of a lever carrying a roller between the cam and the push rod end in order to eliminate the side thrust produced by the cam, particularly that of the inlet with its elongated profile. As a direct deviation from it there is what amounts to a return to one of the oldest standards—that of the rocker arm or walking beam, long a feature of the vertical type of stationary engine, as well as that of the superimposed type in which the camshaft is placed on top of the cylinders instead of along their base. If a leaning there be toward one or the other, where the matter of valve disposition is concerned, it would probably be found to be toward the practise of placing them on the same side of the cylinders owing to the simplification brought about by the elimination of one of the camshafts, although the same end has been attained by the adoption of the overhead type of operation whether by means of rocker arms or directly from a superimposed camshaft, the opposite disposition still being retained and valve pockets done away with. The principle of offsetting the cylinders on the crankcase has come in for considerable attention though its actual advocates are not numerous.

Status of the Motor Accessories.

Though seemingly numerous at first glance, these may be readily divided into the three essentials of carburetion, ignition, and lubrication, and whether taken singly or collectively they are essentials upon which the majority of American cars reveal more of accord than difference. This is true of all three, though in the matter of carburetion there is probably more uniformity than in the other two combined. With but one or two prominent exceptions the water jacket has been considered unnecessary, so it may safely be stated that as a general rule the modern carbureter on the American car is not of the water-jacketed type. In many cases warm air is led from around the exhaust to the vicinity of the carbureter, though the instances in which even this is not considered essential, are far from few.

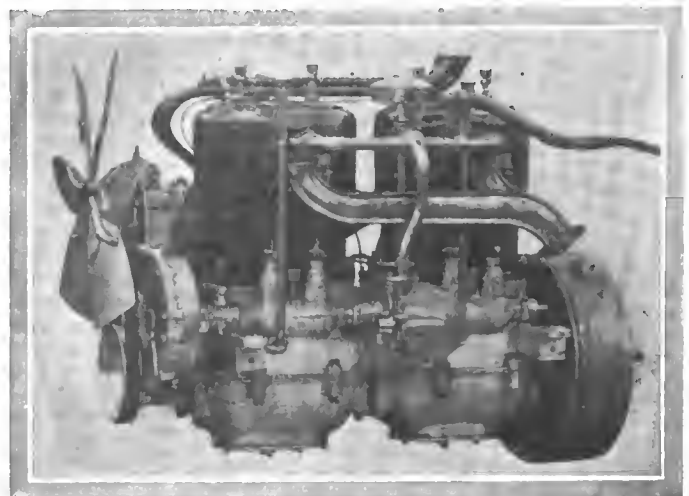


PIERCE GREAT ARROW FOUR-CYLINDER MOTOR.

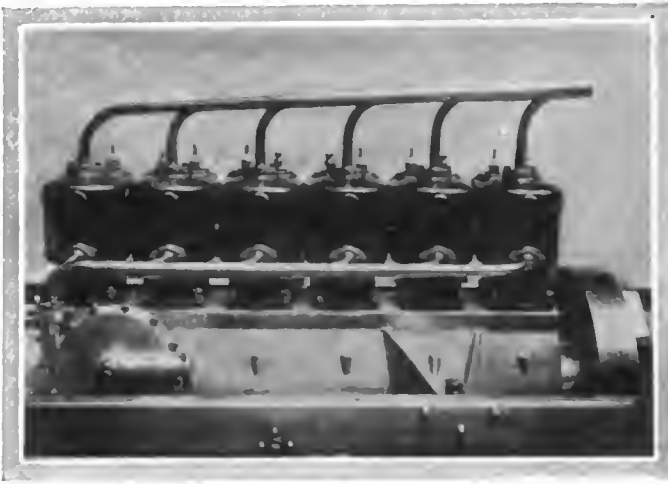
Despite the vogue given the multiple jet type on the other side, which in the end proved short-lived, it found no imitators here, the use of single jet representing practically universal practise. One deviation from this, however, is to be found in the employment of two carbureters of different sizes, fed from a common float chamber, one being employed when the engine is run at reduced power and the other at full load, the same throttle lever actuating both and keeping the larger closed until the smaller is fully open. Another innovation to be found in a carbureter of special design is the introduction of a light fanwheel set directly in the path of the mixture, the suction of the engine causing it to rotate at high speed, mechanically agitating the fuel and causing the gas and air to combine more homogeneously, as well as preventing the introduction of fuel in a liquid or semi-liquid state into the cylinder. Where the prevailing type is concerned the chief difference noticeable is in the form of auxiliary air valve employed, a few using a piston while in the majority a spring-controlled diaphragm is employed.

Ignition and Lubrication Practise.

Where the first of these essentials is concerned, advancement on the American car has been largely governed by the selling price of the latter. It is a matter of common knowledge that no matter how perfect the ignition system may be, it is subject to derangement and that the best insurance lies in its duplication, but as this involves an expenditure disproportionate to the cost of many of the lighter types of cars, its adoption was not possible



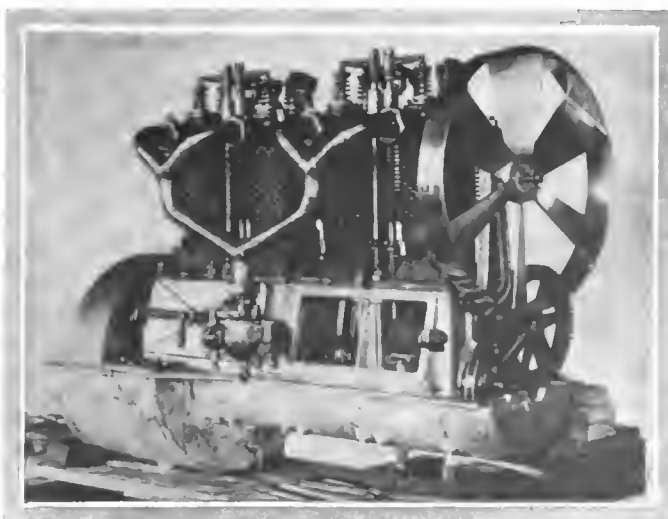
EXHAUST SIDE ROYAL TOURIST 45-HORSEPOWER MOTOR.



THE NEW STEVENS-DURYEA 35-HORSEPOWER "LITTLE SIX."

except as an extra. It takes the form of a magneto system on one side, and an accumulator and coil system on the other, each with its own independent connections throughout as well as separate sets of plugs. This is modified in some instances by dispensing with one set of plugs and in others by employing the same coil as used on the high tension magneto in connection with a special mechanical timer to commutate the battery current which is distributed to the plugs through the high tension side of the magneto. In practically every instance where duplication has been practised both sides are high tension, though there are instances extant in which both high and low tension ignition is employed on the same car. Painstaking attention to the details of coil, accumulator and high-tension cable manufacture together with the extended experience had in the needs of this essential of the car have brought the ignition system of the American automobile to a point where with ordinary care and attention it is no longer the cause of a fraction of the annoyance that it originally gave rise to in the maintenance of a car.

To judge from a census of the motor details of the cars shown, the mechanical type of force-feed lubrication is practically a standard, the advocates of pressure or other types of oil feed being very largely in the minority. The number of independent feeds employed range all the way from two to 14, in some only the most important bearings having a direct oil supply carried to them, while in others even minor bearings ordinarily lubricated by splash are likewise taken care of. The most important exception to this type of lubrication is to be found in the pump-circulating system which is represented by several well-known advocates of its extreme simplicity and reliability, which to a very large



CORBIN 24-HORSEPOWER, AIR-COOLED MOTOR FOR 1907.

extent take the matter of responsibility for lubrication out of the hands of the driver. Though differing in individual instances the system consists essentially of a liberal supply of oil usually carried in a tank in close proximity to the motor, an oil pump and a well at the lowest portion of the crankcase, partitions usually being employed in the latter to maintain the same level under each piston and connecting rod. The overflow from each compartment drains back to the well and after passing through fine screens is again circulated by the pump, this action being continuous as long as the motor is in operation.

Transmission, Drive, and Running Gears.

Starting with the first step in the transmission of the power from the motor to the rear wheels, it is noticeable that the tendency toward the adoption of a form of clutch not possessing the disadvantages of excessive inertia and momentum which are inseparable from the use of a clutch of large diameter and weight, has favored the use of the multiple disk type which is now represented to a very large extent on the American car. Owing to its compactness it has made the combination of the clutch and change-speed gear box an easy matter and this practise is noticeable in numerous instances. The size of the latter has been reduced by the more general adoption of the selective method of gear-changing so that instead of the frame being almost filled with mechanism from side to side at this point as was at one time the case, there is now comparatively little, and this is even more noticeable in the case of those cars in which the change-speed gear box and the bevel drive have been combined at the rear axle in a unit, little if any larger, than that formerly necessary for the differential and bevel drive alone.

Where the final link is concerned, it is obvious at a glance that the limit of power to which the shaft drive is applicable has been steadily increasing from year to year so that now all but the cars of the highest powers employ the propeller shaft and live rear axle, with but one or two exceptions. On heavy cars using double side chains, more attention has been devoted to the latter in order that the difference in the operation of the two types due to dirt and wear on the chains should not be so noticeable on the score of noise. To this end, chain cases are now being provided so that the chains may be kept properly lubricated and away from the deleterious influence of the mud and grit of the road. Not less important than the application of the power itself is the means of bringing the car to a stop when necessary and it is noticeable that with the increase in power much-needed attention has been devoted to the braking equipment. It has become very general to center this on the rear wheels, usually taking the form of internal expanding and external contracting brakes applied to a special drum bolted to each driving wheel, instead of causing the braking effort to act on some part of the power transmission nearer the motor, as was formerly the case.

Wheelbases having reached a point where further increases seem impossible, the use of the channel section pressed steel frame has become practically universal. With the frames of lower grade materials, or of built-up types common a few years ago, the weight in the case of the average car would have proved prohibitive. There are still a few exceptions who cling to former methods or special types of construction of their own where this part of the car is concerned, but they are so largely in the minority as to be overlooked by the casual observer unless special attention be called to this feature. Practice where suspension is concerned has undergone little if any change, although it would seem as if the use of the full elliptic spring had found a greater number of advocates than formerly. There are in addition, scattering instances of the employment of the three-quarter spring on the rear as well as the transverse platform type. Wheel diameters have undergone a very general increase, although the largely increased power of the average American car is likewise responsible for this, the small wheels formerly employed looking totally disproportionate to the remainder of the car. Thus wheels have advanced by jumps from 30 inches, to 32, 34, and 36 inches, the great majority now being of the 34-inch size.



WAGNER'S DARRACQ, SHEPARD'S HOTCHKISS, TRACY'S "LOCO."



HARDING'S HAYNES AND LE BLON'S THOMAS.

AS THE SHOW LOOKS TO A NEWCOMER

By W. F. BRADLEY.

READED in the atmosphere of the Grand Palais, with stage master Gustave Rives as instructor in the art of gorgeous decoration, one feels a strange incompleteness on entering Madison Square Garden for the first time. It is, perhaps, akin to the sensations of a Parisian *belle* on being deprived of her richest toilettes, or of a man about town on losing his *maitresse*. It is useless to argue that neither one nor the other fulfills any useful purpose, and that a chassis on a plain wooden floor is no less a chassis and is much more conveniently examined than the same machine lost among fairy-like decorations costing twice the value of the exhibit. Rives has elevated us—or lowered us, according to the viewpoint—to expect of an automobile show a spectacular display equal to that of the National opera house on a gala night.

Not even the black uniformed ambassadors, flanked by their Swiss guards, strolling through the hall with more dignity than President Fallières and his escort of fussy policemen; not the keen American salesman who has got the finest machine the world has ever seen, and who lets you know it; not even the fair ladies, clad in the best that the Rue de la Paix ever exported, can fill the void. But Rives had he been here would have had a task in making the moderate-sized Garden equal the big Palais.

* * *

"Hello, Wagner, how goes it?"

"O, vous savez, je m'ennuie terriblement ici. They are all right, these Americans; they all come to shake hands with me and I don't know half of them."

"No, I won't have a drink, thanks."

"They give me so many here that my stomach has all gone wrong. This American food, too, you know, isn't bad, but it isn't worth a good plate of French soup."

"They are getting the Cup out," said the Vanderbilt hero, nodding towards a big polished wooden box. "We brought it over with us on the *Bretagne*. It hasn't got my name engraved on it yet, but that doesn't matter to me."

"Will you take your clothes off and sit down here, Mr. Wagner?" interrupted an interpreter in broken French.

"La barbe" (whiskers), said the Frenchman. "I'm not here as an advertisement."

"Those interpreters get on my nerves; I speak as slow as possible, yet they can't understand me. If only there was somebody to speak French to."

"Just sold a car," yelled a round-faced joyous Darracq man,

who explained that he had gone into the automobile business because his legs were too short for cycling. "Tell Wagner that."

"Bon," replied Wagner, "you'll keep a commission for me; I won the Cup."

Close by, on a separate booth, stood the Darracq, the Hotchkiss, and Tracy's Locomobile racer, in charge of an attendant dressed like a Salvation Army man.

"It's the machine that won the cup," said Wagner; "we brought it with us, and are going to run it at Florida, Vevet and I."

"The race don't interest me any more than the show. We shall only run long distances. It's no use trying short spurts against steam. These beach races cannot be compared with the Vanderbilt. No skill is required. You simply open your engine out and let her run."

"Bonne chance, tout de même."

"Merci, au revoir."

* * *

A few yards further on, at the end of the foreign section, stood the Dietrich Vanderbilt racer, just arrived from Paris. Duray, the intrepid, had been unable to accompany it, and the racer will return to France without making its exhaust heard in the land of the Stars and Stripes.

On the opposite side of the hall, peacefully reposing against a background of Swiss mountain scenery were two American racers; the Thomas on which Le Blon displayed his skill, and the plucky little Haynes, which matched itself against the more powerful flyers.

* * *

To European eyes the American exhibits at the Garden Show indicate enormous activity, for which in two cases out of four, an adequate return has not been obtained. Local conditions have, of course, to be taken into consideration, and objections which hold good in Paris, would fall to the ground in New York. Gracefulness of design, compared with French and Italian productions is woefully lacking in many of the American cars. Front wheels are flush with the radiator; rear seats are well astern of the back axle and appear to have been placed to give the maximum amount of discomfort. On the other hand a number of makers have produced vehicles, which, for harmony of lines, rival anything sent from France. Light two-seated runabouts of sufficient power to travel at a rapid clip over any roads are a fine class. Speaking generally, there is more inventive genius and more variety of design—it is not necessarily all good—at Madison Square than at the Paris Show.



DIPLOMATS INSPECTING THE EXHIBITS.

Baron Edmundo Mayer des Planches, the Italian Ambassador, with Col. George Pope and C. R. Mabley of the Show Committee, and two Italian Embassy attaches.

There is not a wholesale copying of European flyers, as some have tried to make us believe, but rather an attempt on the part of each manufacturer to work out his own salvation. Makers of high-grade touring cars follow more or less closely on European types, but outside these, are numbers of distinctly American cars. Air-cooling, a type practically unknown in Europe, has been brought to a high state of perfection, and there is no doubt that some of the models on view would cause a sensation in France.

Planetary gear, overhead valves, copper water jackets, wooden side frames (on air-cooled cars), flywheels in front, and full-elliptic springs, are all, more or less, American features.

Brakes too often are of the external type, very lightly constructed. On the generally lighter chassis built here, they should, however, be quite up to their work. Very few drop frames are seen, though in Europe this type is commonly employed. Propeller shaft drive appears to be more generally adopted here than in France or Italy, where the practice still is, despite a slight ten-

dency this year towards shaft drive, to use chains for high and moderate power cars and shaft only for small machines. Judging from the bare chassis many shafts are unnecessarily inclined.

Excellent examples of coach work are shown and it is not surprising that imported chassis are frequently fitted with American-built bodies. A number of landaulet and limousine automobiles of American construction vie with anything produced in France, and there is one example of an inside steering limousine body equal to any imported article.

INCREASED PRIZE LIST FOR BALLOON RACE.

In addition to the Gordon Bennett Cup to be competed for at St. Louis, on October 19, several prizes of lesser importance will be offered. The cup winner will receive \$2,500 from the citizens of St. Louis, to be taken either in cash or converted into plate. The railroads running into St. Louis offer \$1,000 to the aeronaut making the second best record in distance traveled; John F. Hugent offers \$750 for the third best distance, and J. M. Schroerer offers \$450 for the fourth best record.

It is probable that the Aero Club of America will give a separate cup to the aeronaut who remains in the air the greatest length of time, while the German-born citizens of St. Louis have promised a special cup to the representative of Germany who makes the best record, irrespective of the showings of the other entrants. Frank S. Lahm has sailed for Europe to solicit entries for the race and represent the A. C. A.



A PACKARD ARRIVAL.



SOUTH SIDE OF THE MADISON SQUARE GARDEN EXHIBITS SHOWING STAND OF THE WALTHAM MFG. CO. IN THE FOREGROUND.



A FINE REPRESENTATION OF PACKARD "THIRTIES."



GREAT ARROWS WERE PROFUSELY DISPLAYED HERE.

SOME IMPRESSIONS OF THE LICENSED SHOW

By VICTOR LOUGHEED.

THE 30-35-horsepower Simplex presents a comparatively radical deviation from standard practise in that the cylinders are jacketed with sheetiron jackets, held in place with a multitude of small screws. In this way, all problems of core-sand removal are done away with, and the weight is reduced considerably.

The single C. G. V. chassis on view is one of the number to introduce this year for the first time, the scheme of enameling instead of polishing as an all-over finish. The practical advantage is that rusting is done away with and with it the possibility of injury to clothing from contact with the grease generally used as a protection for the high polish. The chain adjustment is of the eccentric type, which by rotation forces back the radius rods and with them the rear axle. The chain boot used on this car seems to meet with general approval.

On the Royal cars, there appears a novelty in the distance rods used, which are attached at their forward ends to the frame sides by means of a regulation ball joint, allowing free movement laterally as well as vertically, and providing takeup on the wear that at this point is so apt to produce injurious rattling and pounding.

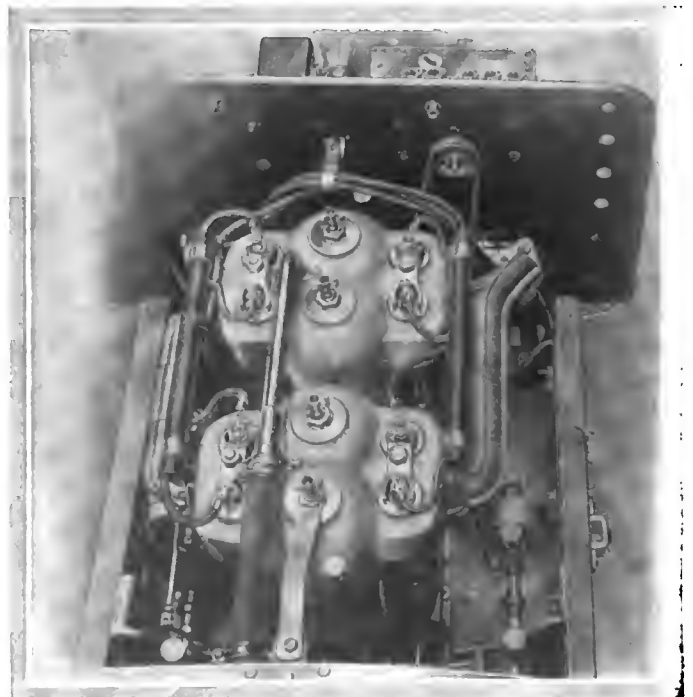
One of the unusual minor features of design, which, though not altogether new, nevertheless causes comment, is the Packard system of controlling the reverse of a sliding gear system by a separate lever, thus making it practically impossible for the reverse to be confused with any of the forward speeds.

Though the large car of the Northern line bristles with novel features, comparatively few of these features are materially different from their counterparts at the last show. The pneumatic clutch and brakes, the use of the two-to-one gears as the circulating pump, etc., are the same as they were, but the extraordinary rear springs are sure to halt the casual observer. They are 60 inches long, and are supplemented by a transverse platform spring shackled to their rear ends.

An interesting detail that appears for the first time on the 1907 Winton cars, of the more powerful type, from which the well-known pneumatic control is eliminated, is the peculiar inter-connection between the throttle pedal and the throttle lever. This inter-connection takes the form of two geared semi-circles, each like half of a bevel gear, between which there is held a floating

bevel pinion. By this means, if the bevel gear attached to the pedal is in any given position, a movement of the lever will instantly act upon the throttle through the bevel gear attached to it, its fellow constituting a fulcrum. Besides this novelty, the actuation of both valves to each cylinder by a single spring placed between them attracts attention. The transmission brake is equalized by a short whiffletree device, following common practise, but a new idea is shown in the method of equalizing the application of the rear-hub brake through means of a long transverse torsion rod, which readily twists enough to produce the compensating effect.

The Lozier people are among the newcomers to the disk clutch idea. Their show chassis is particularly well finished, and though little about it is radical almost everything about it is interesting. The Lozier commutator possibly is the most striking feature, it



PLAN VIEW OF THE 40-H.P. LOZIER MOTOR.

being mounted upon a vertical pillar and rotated in a horizontal frame by a bevel gear on one of the camshafts. There is only one rotating contact, and this consists of a wire brush which can be removed and replaced in less than a minute, making it practically impossible for an irremediable fault to occur. Chain boots are applied on this car, and the filling nozzle on the rearwardly placed fuel tank projects behind the car at a convenient angle and contains within it a simple gauge for showing at a glance the quantity of fuel contained.

Interest at the Cadillac stand centers around a sectioned working model of the new 20-24-horsepower four-cylinder engine. This model is driven by an electric motor, so that all of its parts and functions, even to the spark within the cylinder, occur as nearly as possible as they would in an operative car. This same 20-24-horsepower car departs from previous Cadillac practise in the use of a sliding change-speed gear, of selective pattern, affording three speeds forward. The show chassis is enamel finished.

Though wooden frames have been Franklin practise ever since there were Franklins, the polished and varnished frame on the show chassis will undoubtedly be the first means of impressing many casual motorists with knowledge of this authoritative use of this construction. Another detail of interest is the modification in the operation of the progressive gear shift. By very trifling changes in the form of the sector notches it is made impossible to go in either direction from the intermediate speed without unlatching, or from the low to the reverse without unlatching, though all other shifts require nothing but a push or pull on the lever.

The Pierce cars maintain their high prestige without slavish adherence to accepted forms, and still display the change-speed gear lever on the steering pillar, are equipped with the interlocking clutch control, and have irreversible steering. The brakes are equalized by whiffletrees wider than the frame, through slots in which they work. A somewhat surprising departure is the elimination of the subframe, Pierce engines now being carried on transverse manganese bronze supports, bolted directly to the main frame sills.

The inclined engine of the newest four-cylinder Knox chassis, permitting, as it does, a perfectly straightline transmission through the crankshaft, the gear-box, and the propeller shaft to the rear axle, seems the best of good engineering, as also does the very ingenious three-point support. Change-speed gear and engine both are mounted upon a massive though light aluminum casting, with an opening in it for the flywheel. The casting is held at the rear by two side arms, while at the front it is borne

upon an aluminum bronze cross member by a trunnion permitting slight movement. The irreversible device in the steering gear is interesting because of the quintuple thread and nut.

The star of the Peerless stand is the "Berlin body," which is not like anything ever heretofore seen in this country, but nevertheless looks good. It provides perfect protection for driver as well as for the other passengers and is a most imposing appearing conveyance. R. B. F. annular bearings are used, and a novelty is shown here in that regular lubrication is provided for these bearings by means of small oil boxes and individual leads—a refreshing attention to detail, in view of the more or less current belief that ball bearings don't particularly need lubrication.

The Thomas "Forty" and the Thomas "Sixty" vie with each other in their claim upon popular attention, and are especially worthy of thorough examination, because of the high quality of construction throughout, which absolutely follows the best points of foreign practise, with not a few domestic ideas that take rank with the best of the foreigners. A particular instance of this is the clutch.

Two chief points distinguish the new Pope-Toledo cars—one, the actuation of both valves to each cylinder by a single push rod; and the other, the application of Hess-Bright bearings to the crankshaft. Besides these there is the new multiple disk clutch, the placing of both valves in the cylinder head, and a number of features of minor interest.

Small as has been the growth of the two-cycle idea among the more conservative manufacturers, there is no denying that the two-cycle Elmore, as presented in the form of a splendid working model, driven by an electric motor, "looks good" to the expert and the layman alike. Certainly nothing could emphasize more strongly the absence of valves and other complications, while the answer to any other objections is found in the number of Elmore's that are running and making good.

The Oldsmobile four-cylinder car has joined the ranks of those to discard the tubular front axle for the more popular I-beam. With this, and at a slightly increased price, the stroke and bore have been both increased a quarter of an inch, raising the power from 28-30 to 35-40.

The unusual idea on the Corbin car is most strongly expressed in the double expanding brakes, a pair in each rear hub, one worked by pedal and the other by the emergency lever. Another feature that is unique is the use of Hess-Bright bearings on the crankshaft ends alone, the other three crankshaft bearings being of the plain type.



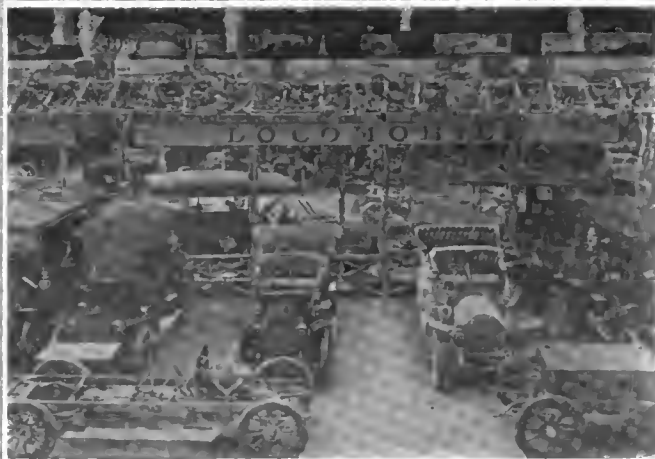
WHERE THE AIR-COOLED FRANKLINS REIGNED SUPREME.



AT THE STAND OF THE WINTONS MODEL M PREDOMINATED.



THE PEERLESS WAS EFFECTIVELY DISPLAYED.



LOCOMOBILES MADE AN ATTRACTIVE SHOWING.

THE AMERICAN CARS OF 1907 IN GENERAL

AUTOCAR models for 1907 comprise a complete series from runabouts to limousine and landaulet. One of the most radical improvements is the three-point suspension of the power plant. Motor, flywheel, clutch, and transmission are inclosed in an aluminum housing, bolted together and supported as a unit at three points, two arms from the motor to the side members of the frame, and the third point under the transmission is seated on a stiff spring. This method of supporting the power plant does away with sub-frame construction, lessening the weight of the cars. Motor is now much more powerful, frame is of channel steel, and on Model XIV. the wheelbase has been increased to 112 inches. Road wheels have been increased to 34 inches, metal mud guards are employed, side entrance is wider, there is a light mahogany dash and a new design of radiator and hood with the radiator placed directly over the front axle, giving the car a very rakish appearance.

Apperson.—The entire attention of this concern is devoted to the construction of a four-cylinder, 50-horsepower model with independent cylinders 5 1-2 by 5 inches. Valves are on opposite sides. The engine is water-cooled, a tubular radiator being carried. Ignition is by high-tension magneto and accumulator. The clutch is of the constricting band type, selective change-speed gear is employed, giving four speeds and reverse, and final drive is obtained through side chains. Selling price is \$5,000.

Buick.—A 22-horsepower touring car and four types of 25-30-horsepower touring or runabout machines constitute the 1907 Buick designs. The 22-horsepower machine has two-cylinder opposed engine, 4 1-2 by 5 inches, plain bearings, valves placed in the head, water-cooling with tubular radiator and gear pump. The 25-30-horsepower model is a four-cylinder machine 4 1-4 by 4 1-2, cylinders cast in pairs, valves on one side, disk clutch and shaft drive. A special feature of the 25-horsepower machine is the selective type planetary transmission (Buick design).

Cadillac.—Nine models constitute the Cadillac line for 1907. Of these five are made by using different bodies on the 10-horsepower chassis, as follows: Model K runabout, \$800; Model M light touring car, \$950; Model M with folding tonneau, \$1,000; Model M coupé, \$1,200, and Model M light delivery wagon, \$950. The motor in the above models is the same as the Cadillac company has used in all its small cars and has single cylinder, 5 by 5, copper water jacketed. Pressed steel frame is used, wheelbase is 76 inches. Model H, a 30-horsepower car, will form the leader of the Cadillac line. An entirely new machine is Model G, a 20-horsepower four-cylinder automobile. In designing the new models all distinctive Cadillac features have been retained.

Although the three speed planetary gear is still retained on the heavier model for 1907, Model G has been fitted with a selective type of sliding change-speed gear, designed on modern lines. Both the main driving shaft and the countershaft run on roller bearings in steel bushings. This change-speed gear gives three speeds forward and reverse, control being by a single lever operating in the usual H-shaped quadrant, and when the direct drive is employed no gears are in mesh and the countershaft is idle.

Columbia.—Chief among the Electric Vehicle Company's models is a gasoline-electric automobile. The motor is of the standard four-cylinder vertical type employed on Columbia cars with the difference that the flywheel has been displaced by the generator in direct connection with the crankshaft of the motor and hardly occupying more space than the wheel which it displaces. Immediately behind the generator the motor is placed, though there is no mechanical connection between the two on any but the high speed, when the crankshaft of the motor and the propeller shaft terminating at the live rear axle become solidly coupled and both the dynamo and motor run dead. The low speeds, of which there are five forward and a reverse, are all provided by means of a small lever similar to the controller handle on street railway cars. No storage batteries are employed. The low speeds are used in starting, the motor being capable of a heavy overload, and when up to speed a clutch is employed to couple the motor and propeller shafts, the car running exactly as one equipped with the usual change-speed gear. Gasoline automobiles include a standard touring car and a limousine, both of 24-28 horsepower and a 40-45-horsepower machine.

Corbin.—A 24-horsepower air-cooled machine is the sole representative built by this company. The engine is of the vertical four-cylinder type, cast separately and air-cooled by a special system. Cylinder dimensions are 4 1-4 by 4 1-4. Valves are placed in the head, operated by rocker arms. The clutch is of the cone type, there is selective change-speed gear and shaft drive. Wheelbase is 108 inches and weight 2,200 pounds. \$2,500 is the list price of the machine, the seating accommodation of which is five persons.

Elmore is the steadfast exponent of the two-cycle principle, all its models at the Garden Show being of this type. They consist of a four-cylinder 30-35-horsepower, with a long wheelbase and luxurious body, selling for \$2,500; a three-cylinder 20-24-horsepower touring car listed at \$1,750, and a very racy three-cylinder runabout with turtle deck, giving ample space for spare tires, dress case or trunk. Owing to numerous inquiries received relating to the two-cycle principle, the Elmore company shows

a sectional engine run by electricity. Much attention has been paid to the refinement and perfection of small details, these minor changes being responsible for the great increase in power of the new engine over last year's models.

Franklin lines consist of ten models, using three different size motors, 12, 20 and 30-horsepower. Five distinct types are exhibited at the Garden Show: Type G, four-cylinder 12-horsepower light touring car, at \$1,850, with sliding-gear transmission, shaft drive and a speed of 35 miles per hour; type D, five-seated, 20-horsepower four-cylinder car, with sliding-gear transmission, three speeds, shaft drive, giving a speed of 45 miles per hour, price \$2,800; type H, seven-seated, six-cylinder 30-horsepower touring car, with sliding-gear transmission, shaft drive and giving a speed of 50 miles per hour price \$4,000; type G is an \$1,800 four-cylinder runabout of 12 horsepower, carrying two passengers and having sliding-gear transmission, three speeds and shaft drive; type J, a light commercial truck, listed at \$2,000, develops 12 horsepower, has sliding-gear transmission, three speeds and worm gear drive. No changes have been made in distinctive Franklin features, though improvements have been made in several places. Bodies are more spacious and planned to give greater convenience. The oiler has been removed from dash and placed at side of engine base where it is operated by direct gear. Larger wheels are used, giving greater road clearance, and all models are equipped with new self-finding gear-shifting device. The transmission universal joint block is of new design, the valve action has been improved, and a new style of connectionless intake pipe is used on all models.

Haynes.—The Haynes showing consists of a 50-horsepower limousine, a 30-horsepower landaulet, a 50-horsepower tonneau, a 30-horsepower touring car, and polished chassis of both the 50 and 30-horsepower models. One of the features of the exhibit was the Vanderbilt Cup racers, recently purchased by William C. Thorn, of Chicago. Haynes models have all four cylinders, cast in pairs for the 30-horsepower machine, but independent on the 50-horsepower model. Valves are on opposite sides. Water-cooling is by honeycomb radiator and rotary pump. Ignition is by high-tension magneto and sparking plugs. Drive is by propeller shaft to rear live axle. Roller bearings are employed throughout.

Hewitt.—Two different chassis only of the Hewitt automobile are constructed for pleasure use. One, a 10-horsepower single-cylinder runabout or town car; the other, an eight-cylinder developing 50-60 horsepower. The single-cylinder machine is listed at \$1,000 as a runabout and has a seating capacity for four. Its mechanical features are disk clutch, planetary change-speed gear and single chain drive. Wheelbase is 72 inches. The 50-60 model has two rows of cylinders forming a V, two pairs on each side. Disk clutch is employed, planetary speed-change gear and shaft drive. Valves are all on one side; water-cooling is by cellular radiator and centrifugal pump.

Knox.—A patented system of air-cooling is the distinctive feature of all Knox cars, the model G, of 35-40 horsepower, being the leader for 1907. A complete line of pleasure vehicles is constructed, among them being a stanhope, a distinctly new type of high-powered runabout of light weight, and a new model, H, of 25-30 horsepower. A distinct novelty is an automobile fire wagon mounted on a standard 40-horsepower chassis, carrying chemical fire extinguishers and having accommodations for a number of firemen. Two new trucks with a load capacity of 5,000 and 6,000 pounds respectively, are also a feature of the Knox line for the coming year.

Lozier models consist of a regular 40-horsepower type F seven-passenger touring car, a 40-horsepower runabout finished in royal purple and upholstered in French gray leather, a 40-horsepower limousine and a 60-horsepower touring car. Apart from the chain cases there is nothing of a startling nature, all well-tried features of last year being retained. They include pistons lathe-turned inside and out; crankshaft machined from solid slab of 30-point carbon steel; camshafts made from solid bar; double ignition system with independent plugs for each system, Simms-Bosch magneto supplying current for one with a Witherbee storage battery for reserve. Water-cooling is by two fans, one back of radiator, the other formed by flywheel blades; sliding-gear transmission, four forward speeds, selective type; safety dog and ratchet back-stop device on jackshaft; Hess-Bright D. W. F. ball bearings throughout; multiple disk clutch in oil-tight case; a clutch brake stops motion of gears and prevents clashing. Water-cooling is fitted for brakes, and emergency brake has lever pulling towards operator. A continuous aluminum pan entirely protects motor. Drive is by side chains.

Locomobile.—Two standard models of 20 and 35 horsepower, each of which is fitted with either open or closed body, are exhibited. A distinctive feature of the showing is the number of drop forgings made for the 1907 product. The Locomobile Company has always made its own forgings, but the number of pieces for 1907 is greater than ever before owing to the fact that the facilities of the forge shop at Bridgeport have been increased materially. They range from tiny forgings the size of a door key and weighing an ounce or so to massive forgings for axles, shafts and other large components of the car. The 90-horsepower racer which Tracy drove in the Vanderbilt Cup contest was on view and attracted considerable attention.

Matheson.—Two chassis are produced by the Matheson Motor Car Company. One is of 35 horsepower and the other of 50 horsepower, these two replacing the 40 and 60 models of last year. Four different styles of body may be fitted to each chassis—runabout, regular touring body, landaulet and limousine. The Matheson carries a four-cylinder vertical motor, has sliding-gear transmission and double chain drive. A distinctive feature is the ignition system of make-and-break type with a low-tension alter-



ALL AUTOCAR TYPES FOR 1907 WERE SHOWN.



"BIG SIX" AND "LITTLE SIX" THE ATTRACTIONS.



AT THIS STAND THE TWO-CYCLE WAS KING.



SIMPLEX MODELS OF SMITH & MABLEY.

nating magneto of the Simms-Bosch make as a source of current. Extensive improvements have been made in the carbureter, which is different from that of last year, being new in many respects as the result of close study given this essential. The cylinders are cast individually with integral water jackets and mechanically-actuated valves by a special form of superimposed type of camshaft. A useful device fitted to the machine is a hill pawl by which the operator can stop the car while ascending a grade and hold it without using the brakes.

Northern.—Two distinct models of Northern automobiles are manufactured for 1907. The smaller is a 20-horsepower double-opposed motor carried transversely on the frame, cylinder dimensions being 5 1-2 by 5 1-4. The engine is water-cooled and carries a tubular radiator and rotary eccentric pump. Expanding ring clutch is employed, change-speed gear is of the planetary type, and shaft drive is used. With a touring body this automobile seats five and is listed at \$1,700. In the 50-horsepower type the four vertical cylinders, 5 by 5 1-2 inches, are of one casting, with valves placed in the head, using rocker arms. The engine is water-cooled and carries a tubular radiator; clutch is of the compressed-air type, three speeds and reverse are obtained through sliding gears and shaft drive is employed. Seven persons can be carried in the 50-horsepower model, the selling price of which is \$3,500.

Olds.—The new Oldsmobile model has a four-cylinder vertical water-cooled motor, developing from 35 to 40 horsepower, of the same design that has proved so successful during the past year. On this chassis three different styles of car will be built, a palace touring car selling for \$2,750, a flying roadster at the same figure, and a limousine listed at \$3,800. Accessibility has been sought throughout, and by removing the hood the entire motor may be examined. Mechanical features are interchangeable valves, aluminum crankcase and improved piping arrangements. Transmission control and clutch remain practically the same as last year, with a few minor changes. A larger and better equipment has been added, consisting of full set of tools, two acetylene head lamps and well designed luggage carrier. The limousine has received special attention in upholstery and finish; every detail has been well thought out down to speaking tube, electric lights, toilet set, and other small but essential conveniences.

Orient and Waltham Orient.—The models of these lines consist of three types of single-cylinder machines of 4 horsepower, with friction clutch, double chain drive, air-cooled and high-tension ignition; a four-cylinder runabout of 16-20 horsepower, selling at \$1,750, and a four-cylinder touring car of 20 horsepower, listed at \$2,100, with cone clutch, sliding change-speed gear, shaft drive, wheelbase 96 inches, weight, 1,850 pounds. All Orient models are air-cooled, cylinders, of course, being independent and valves are all on one side.

Packard.—Only one model of the Packard machine is manufactured. It is a four-cylinder 30-horsepower automobile with 5 by 5 1-2 cylinders cast in pairs, valves on opposite sides, water-cooling with tubular radiator and gear pump. The clutch is of the internal expanding type, sliding change-speed gear is employed together with shaft drive. In reality the single model divides itself into two, one being a runabout with 108 inches wheelbase, the other a touring car of 122 inches wheelbase; a handsomely equipped limousine is also shown in the Garden. Mechanical features are identical and the list price, \$4,200, is the same for the two, while the limousine sells at \$5,500.

Peerless.—Two 45-horsepower models and one 30-horsepower machine are built by the Peerless company. In each type the cylinders are cast in pairs with valves on opposite sides, water circulation being provided by a tubular radiator and a gear-driven pump. Cylinder dimensions of the 45-horsepower chassis are 5 1-4 by 5 3-4; for the 30-horsepower they are 4 5-8 by 5 1-2. Change-speed gear is of selective type; internal expanding band clutch and shaft drive are employed. Wheelbase is 109 inches on the lower power and 114 inches on the larger model. This firm is the only one to exhibit a limousine with inside steering.

Pierce Great Arrow.—A 65-horsepower six-cylinder car is the leading feature of the Pierce line for the coming season. Other types are a 45-horsepower runabout, selling at \$5,000, and a 28-32 "Suburban" model. The six-cylinder car of Glidden Tour fame has independent cylinders 5 by 5 1-2 inches, valves on opposite sides, disk clutch, sliding-gear transmission and shaft drive. Wheelbase is 122 inches and weight 3,500 pounds. Ignition is by high-tension Simms-Bosch magneto with accumulator in reserve. A cellular radiator is employed, fed by a centrifugal pump.

Pope-Toledo, Pope-Hartford, Pope-Tribune.—There is a comprehensive list of models from the Pope factories, comprising Pope-Waverley electrics, Pope-Toledo, Pope-Hartford and Pope-Tribune gasoline automobiles. Pope-Toledo models include a 50-horsepower touring machine, at \$4,250; 50-horsepower runabout, at \$4,250; also limousine, demi-limousine and landaulet. Pope-Hartford lines are 25-30-horsepower touring car, at \$2,750; 25-30-horsepower runabout at the same price, in addition to limousine and landaulet models. A Pope-Tribune runabout of 16-20 horsepower is listed at \$1,750. An entirely new model is the 50-horsepower four-cylinder Pope-Toledo with multiple disk clutch, selective type of change-speed gear and double chain drive. Wheelbase is 115 inches and weight 2,900 pounds.

Royal Motor Car Company.—Only one type of Royal Tourist automobile is constructed. Rated at 45-horsepower, it carries a four-cylinder motor with 5 1-8 by 5 1-2 cylinders cast in pairs; water-cooled by cellular radiator and rotary pump. Valves are on opposite sides. Change-speed gear is of the sliding type, cone clutch is employed, and final drive is by shaft. Wheelbase is 114 inches. Selling price is \$4,000. On this chassis several

types of bodies are furnished, ranging from a simple runabout to an elaborately finished and equipped limousine.

Simplex.—Two Simplex models are presented for 1907. One is rated at 30-35 horsepower, the other at 50 horsepower. In each case the engine is of the four-cylinder type, cylinders 4 1-2 by 5 1-2 for the 30-35; 5 7-8 by 5 7-8 for the 50 horsepower, cast in pairs. Water-cooling is employed, using a honeycomb radiator and centrifugal pump. Change-speed gear is of the selective type, giving four speeds forward and reverse, cone clutch is used, and drive is by side chains. Bronze and babbitt bearings are used throughout. The Simplex runabout is listed at \$5,760. Price of the 30-35-horsepower model varies according to body, chassis alone selling at \$4,950.

Stearns.—One type of chassis only is made by the Stearns company. Its rating is given as 30-60 horsepower; this is explained by the fact that a special system of carburetion has been adopted. It consists of a small and a large carburetor fed from a common float chamber. On the small one the motor develops 30-horsepower, the larger not coming into service until the small one is fully open. The four cylinders are cast in pairs, their dimensions being 5 3-8 by 5 7-8. D. W. F. ball bearings are used throughout and valves are all on one side. The engine is water-cooled, a tubular radiator and rotary pump being employed. The clutch is internal expanding, the selective change-speed gear gives four speeds and reverse, and final drive is by double chains.

Stevens-Duryea.—This line includes one four-cylinder, developing 20 horsepower, and two six-cylinders, one of them of 35 horsepower and the other of 50 horsepower. On all three models the cylinders are cast separately and are water-cooled through cellular radiator and centrifugal pump. Bearings are plain, valves are on one side and high-tension ignition is employed. Both four and six-cylinder types have disk clutch, sliding change-speed gear and shaft drive. The Stevens-Duryea company is a pioneer in six-cylinder construction. The success which has attended their efforts is shown by the fact that this year they produce two six-cylinder models. Wheelbase of the "big six" is 122 inches, rear springs are 54 inches in length, and front springs 54 inches. With a touring body there is seating accommodation for three persons on rear seat, two on the extra Pullman seats, and two in front. Including a full equipment, this machine is \$6,000.

Studebaker.—The chief gasoline car manufactured by this company is a 30-35-horsepower chassis, the features of which are four cylinders measuring 4 1-8 by 5 1-4 inches, cast in pairs, water-cooling, cellular radiator, low tension magneto, cone clutch, sliding change-speed gear, giving three speeds and reverse, and shaft drive. Wheelbase is 104 inches.

Thomas Flyer.—In general outward appearance the Thomas 60 horsepower flyer for 1907 does not differ materially, with the exception of the changed outline of the radiator and bonnet, from

its predecessor of the year previous, though there have been many changes in refinement, simplification and last but by no means, least lightening of the gross weight of the car. The four-cylinder motor rated at 60 horsepower is one of the points on which weight has been saved, yet it has been made stronger and better able to perform the service required of it, due to improved methods of construction. The cylinders are cast separately with integral water-jackets; valves are all mechanically operated, oppositely disposed and are interchangeable. Two separate and distinct ignition systems are fitted, each being of the high tension type and having an independent set of plugs. The current for one is supplied by a Simms-Bosch high tension magneto, while a set of accumulators working through an Atwater-Kent spark generator comprises the other system.

Thomas "Forty."—A four-cylinder engine with cylinders of 4 3-4 by 5 inches, cast in pairs, valves all on one side, water-cooling through tubular radiator and centrifugal pump, cone clutch, selective type of change-speed gear, and shaft drive are the outstanding features of the Thomas "Forty." An interesting departure from standard practise is embodied in the valve operating mechanism rendering the setting of the valves readily adjustable. The suspension is of the semi-elliptic type both front and rear, the latter measuring 52 by 2 1-4 inches, and the former 36 by 2 inches. A pressed steel frame of the usual channel section is employed, with a subframe dropped four inches for the support of the motor and transmission. Two sets of brakes are fitted.

Walter.—This line consists of a 40-horsepower car with cylinders 5 by 5 1-2 and a 50-horsepower 5 1-2 by 6, each with four cylinders cast in pairs. Valves in each case are placed in the head and on the side. Ignition is by high-tension magneto and accumulators in both cases. Each type may be had with either disk or cone clutch, change-speed gear is of the double sliding type, and shaft drive is employed. Wheelbase in each type is 124 inches. The engine is water-cooled, the radiator being of the honeycomb type.

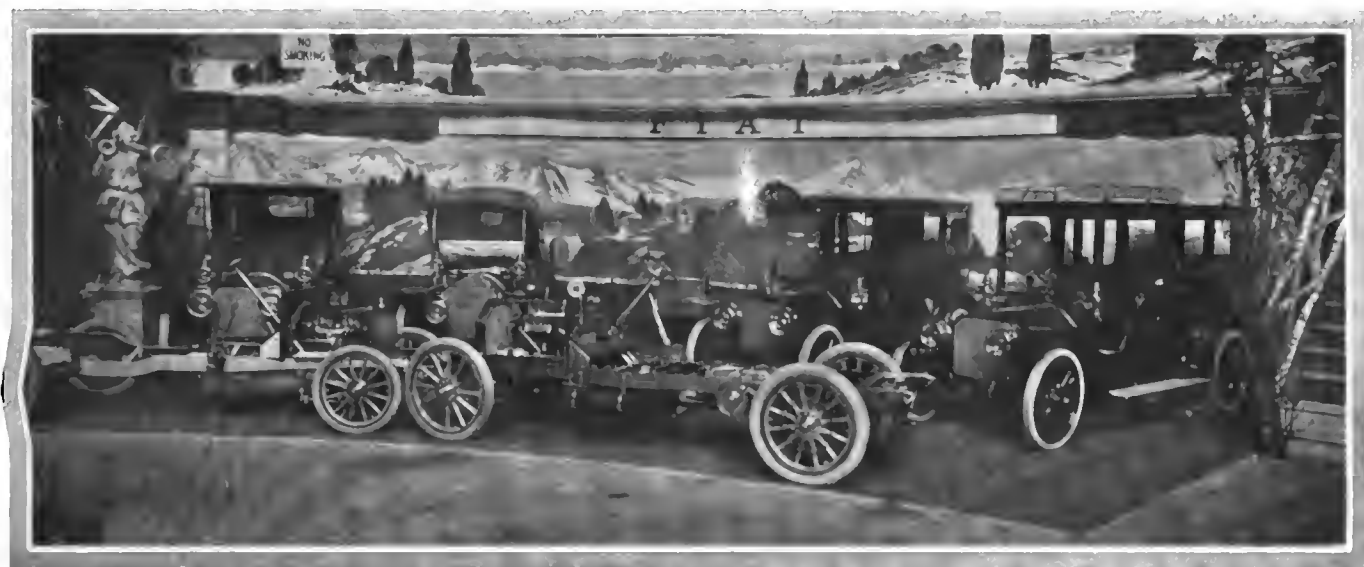
Winton.—Two distinct models are put forth by the Winton Company for 1907, a 30-horsepower car, known as Type XIV, and an entirely new machine of 40 horse power, known as Model M. The chief feature in which the latter differs from its predecessors is in having off-set cylinders, change-speed gear of the selective sliding-pinion type, and a channel section pressed-steel frame in place of the armored wood frame employed on the lighter car last year. The motor of the new car has 5 by 5 cylinders cast in pairs, with water jackets completely surrounding each cylinder. Valves are all on one side. A multiple disk clutch is employed, housed in the same aluminum casing as the change-speed gear. Four speeds and reverse are obtained by the selective type of gear-change mechanism. Final drive is by propeller shaft and rear live axle.



MATHESONS AND STEARNS WERE ELEVATED.



THE GARDEN HOME OF THE CADILLACS.



AT THE LEFT OF THE ENTRANCE TO THE BIG AMPHITHEATER THE EXHIBIT OF FIATS WAS IMPRESSIVE AND COMPLETE.

THE FOREIGNERS OF THE GARDEN SHOW

WITH twelve of the most important European firms exposing at Madison Square Garden, and including such constructors as Renault, Panhard, C. G. V., Bayard-Clément, Darracq, Hotchkiss, Dietrich and Rochet-Schneider from France; Fiat and Isotta Fraschini from Italy, and Daimler from England, the promoters may justly claim to have united the world's best automobile construction outside the United States. In every case 1907 models are shown, and although the booths do not contain an example of every model produced, in all cases the factories' best is on view. As in the case of Bayard-Clément and Darracq, small runabout models are not always handled in America owing to the high duty. European constructors are too much impressed with the importance of the American market not to make a strong effort, despite the difficulty they have in being ready for the Paris Salon, to ship over their new products for exhibition at our national show.

Renault.—Six distinct models are made by the Renault firm for 1907. The 35-45, 20-30, 14-20 and 10-14 have four vertical cylinders; a 10-14 and an 8-9-horsepower model have each two vertical cylinders. In general construction the 1907 models are very similar to those of last year, main features being cylinders cast in pairs, with mechanical valves all on one side, no governor, ignition by Simms-Bosch magneto and sparking plugs, automatic carbureter, thermo-siphon water cooling with tubular radiator forming dashboard, leather-faced cone clutch and transmission by cardan shaft to rear axle. The change-speed gear gives four speeds forward and reverse with a "straight through" lever. A new feature is the adoption of three-quarter elliptic rear springs in place of transverse rear spring previously employed. The 10-14-horsepower two-cylinder machine, extensively employed in European cities for cab work, differs from the larger models in only having three forward speeds. Transverse rear spring is retained on this model. The 8-9-horsepower is but a reduction of the larger type. A self-starter can be supplied with the larger Renault models.

C. G. V.—These cars for 1907 are of 20, 30, 50 and 75 horsepower. In addition a 14-horsepower machine has been designed specially for town use embodying many new features. All models have four separate cylinders with mechanically-operated valves on opposite sides. Ignition is by magneto and sparking plugs, transmission through countershaft and side chains to rear wheels, direct drive on the high gear, and straight-through type of lever.

Water circulation is obtained by gear-driven pumps, and lubrication is of force-feed type. Ball bearings are employed throughout. A new feature is the use of chain cases and a special device for regulating tension of chains. The 14-horsepower town model has drop frame, longitudinal C and transverse rear spring, transmission by cardan shaft to rear axle, and driver's seat placed at the left instead of the right-hand side. Levers are consequently in the center.

English Daimler.—The cylinders on this machine are cast in pairs, with all valve chambers on left-hand side and one camshaft accordingly, but a light shaft is fitted on the other side of engine for driving pump and magneto. Engine and gear box are carried by brackets direct on to frame, three-point suspension being employed. Carbureter is on usual lines, but modified to give better proportion of mixture at all speeds. High-tension accumulator-fed synchronized ignition is fitted. The low-tension contact maker and high-tension distributor are set on the top of a vertical shaft at left-hand front of engine and driven by bevel gearing from forward end of camshaft. Water is delivered from the circulating pump to the end of each valve chamber, passes across the bases of the valve chambers, flows upwards around each valve and returns to radiator over crown of combustion chambers. Standard clutch is retained, but is now carried on extension of crankshaft.

Darracq.—These models are very complete. Beginning with a six-cylinder machine, 100 mm. bore by 120 mm. stroke, they descend down in easy stages to small runabout of moderate power. The six, an entirely new machine, is the most interesting of the lot. Its distinctive features are transmission by cardan shaft with double joint between the gear box and motor to rear live axle. Cylinders are cast in pairs, with valves all on one side; ignition by high-tension magneto. Of the light cars there are a two-cylinder 10-12-horsepower and a four-cylinder 16-18-horsepower model, both made with either long or short chassis for tonneau or side-entrance body. There are two models of four-cylinder touring cars, each of 20-28 horsepower, differing only in their change-speed gear. A self-starter is fitted to the larger machines at an extra cost. Instead of change-speed lever being placed below steering wheel, it is now on the side of the car, according to general custom.

Fiat.—A six-cylinder 50-horsepower chassis with self-starting apparatus, a 35-horsepower four-cylinder runabout, and

a 15-horsepower town chassis are the chief Fiat productions for 1907. Cylinders are cast in pairs, valves are on opposite sides, ignition by low-tension magneto, water circulation by centrifugal pump and honeycomb radiator. Ball bearings are used throughout, there are four speeds forward and reverse, with gate type of change-speed gear. The Fiat novelty for 1907 is the 15-horsepower chassis specially designed for town use. It has a special drop frame, allowing of a very low side entrance, and transmission by cardan shaft to rear axle. Another Fiat feature is a two-seated runabout specially constructed for American roads, having special luggage-carrying facilities and a seat for chauffeur on the footboard.

Bayard-Clément.—This firm has adhered closely to last year's design in constructing the 1907 models. Ignition is now by magneto and sparking plugs for all machines, but all other Bayard features have given so much satisfaction that it has not been thought necessary to make changes. A new two-cylinder two-seated runabout has been created to meet a popular demand as well as a moderate-priced four-cylinder runabout at a low price. The low and moderate power machines have transmission by cardan shaft, the 24-30-horsepower, the 35-45 and 50-60 all have drive through countershaft and side chains to rear wheels. No six-cylinder models are constructed. The fours have separately cast cylinders with valves on opposite sides, all interchangeable. A metallic disk clutch is employed and the large models have ball bearings throughout.

Isotta-Fraschini.—The principal models of this Italian firm are a 35-horsepower four-cylinder runabout and a 50-65 six-cylinder machine. In both cases cylinders are cast in pairs with valves on opposite sides. Double chain drive is employed, there are four forward speeds and reverse, with selective type of change-speed gear and disk clutch. A new feature of the Isotta Fraschini models is a self-starter consisting of a gear-driven pump on the countershaft, compressing air into a metal tank placed in any convenient position on the chassis. Inlet piping connects up the tank to the motor, and by the pressing down of a lever the compressed air is admitted to those cylinders under compression.

Hotchkiss.—This concern devotes its attention chiefly to the new six-cylinder car, with three groups of cylinders placed as close together as possible to save space. Hotchkiss was a pioneer in the use of ball bearings, and has used them throughout in the new six. Valves are placed on opposite sides, camshafts are cut out of the solid and case-hardened. Timing gears are inclosed in oil-tight case at the front of motor and are metal against fibre. Ignition is by high-tension gear-driven Eiseman swinging magneto on the exhaust side. The carbureter is the new Mann type, warmed with hot air from the exhaust. Last year's honeycomb radiator and gear-driven pump are retained. Only slight changes have been made in the leather-faced cone clutch mounted on an extension of the crankshaft. Transmis-

sion is by cardan shaft to live axle, and brakes are double-acting type on shaft behind gear box and on steel drums on rear wheels. Two four-cylinder models are also constructed.

Panhard.—These models are 18, 24, 35 and 50 horsepower, all with four cylinders cast separately. The crankshaft has five bearings and lower half of crankcase can be taken off without disturbing the shaft. Valves are placed on opposite sides, water circulation is by gear-driven pump turning at the same speed as the motor, and a honeycomb radiator is employed. Ignition is by high-tension magneto and sparking plugs, accumulators also being carried. The magneto is mounted on the same shaft as the water circulating pump. A special metallic clutch is employed and transmission is by countershaft and side chains. There are four speeds forward and reverse with lever of the straight-through type. Brakes act on the differential and on the interior of drums on rear wheels.

Rochet-Schneider.—These models are four in number, rated at 16-20, 30-35, 40-45 and 70 horsepower. The first three have four cylinders cast in pairs, the 70-horsepower having six cylinders, also in pairs. Transmission in every case is by countershaft and side chains to rear wheels; ignition is by low-tension magneto, gasoline has pressure feed, water circulation by rotary pump and tubular radiator. There are four speeds and reverse on each model, with selective type of change-speed gear.

De Dietrich.—These types are 16, 24, 40 and 60 horsepower, all with four cylinders cast in pairs, but with a common water chamber for the whole group. Low-tension Simms-Bosch magneto is employed with sparking mechanism on side of cylinders. Water circulation is by gear-driven pump and gilled tube radiator. Gasoline tank is under pressure. Transmission is through countershaft and side chains, with "gate" type of change-speed lever.

Rolls-Royce.—Although enjoying a good reputation in England, where it won the important Tourist Trophy last year, the Rolls-Royce machine is practically unknown in America. Standard models are a 20-horsepower four-cylinder, a 30-horsepower six-cylinder, and a 40-50-horsepower six cylinder. The last named is an entirely new car having cylinders cast in sets of three with all the valves on one side, the whole being set upon an aluminum crank chamber of ample dimensions. The Rolls-Royce carbureter is accessibly placed on right-hand side of engine, the induction pipe leading away between the two sets of cylinders, joined up to the distributor pipe at the center. Exhaust pipes have rather a unique arrangement, there being a small expansion chamber to each set of cylinders leading away to the muffler below frame. Double ignition is employed, the coil and two-way switch being only parts carried on the dashboard. Final drive to the rear road wheels is through propeller shaft and bevel gearing. The whole of the mechanism is set upon a double cambered pressed steel frame mounted upon substantial springs, giving a very substantial look to the car as a whole.



DARRACQ EXHIBIT, WHERE VANDERBILT CUP WAS SHOWN.



BAYARD-CLEMENTS AS PRESENTED BY SIDNEY BOWMAN.

1907 MODELS OF THE LEADING MAKERS



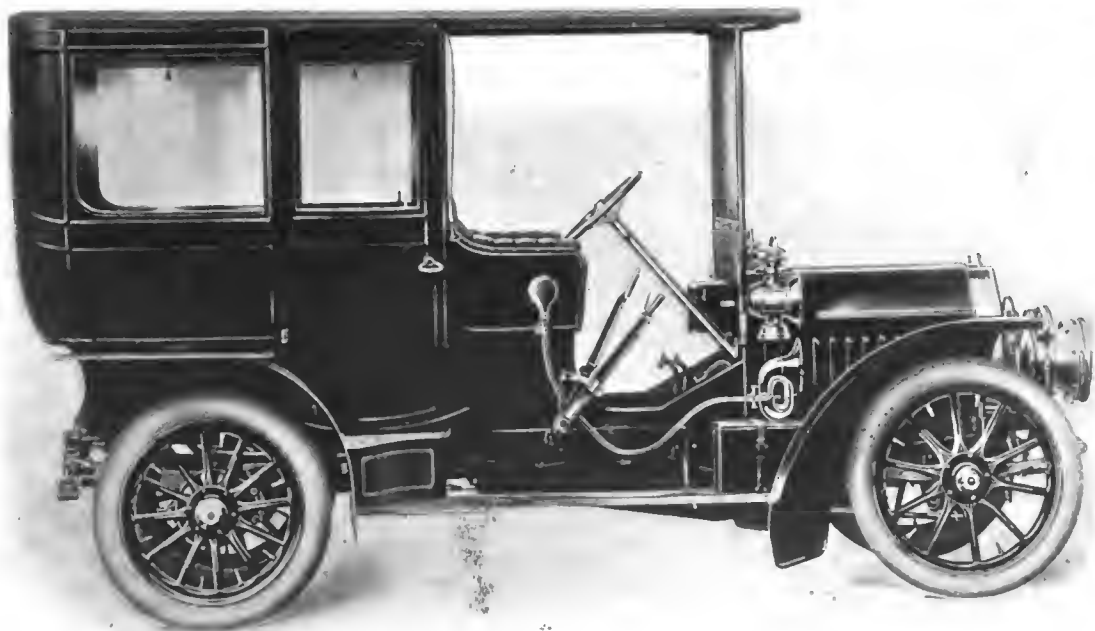
PACKARD LANDAULET, 30-H.P., 4 CYLINDERS, PRICE \$5,500.
Packard Motor Car Co., Detroit, Mich.



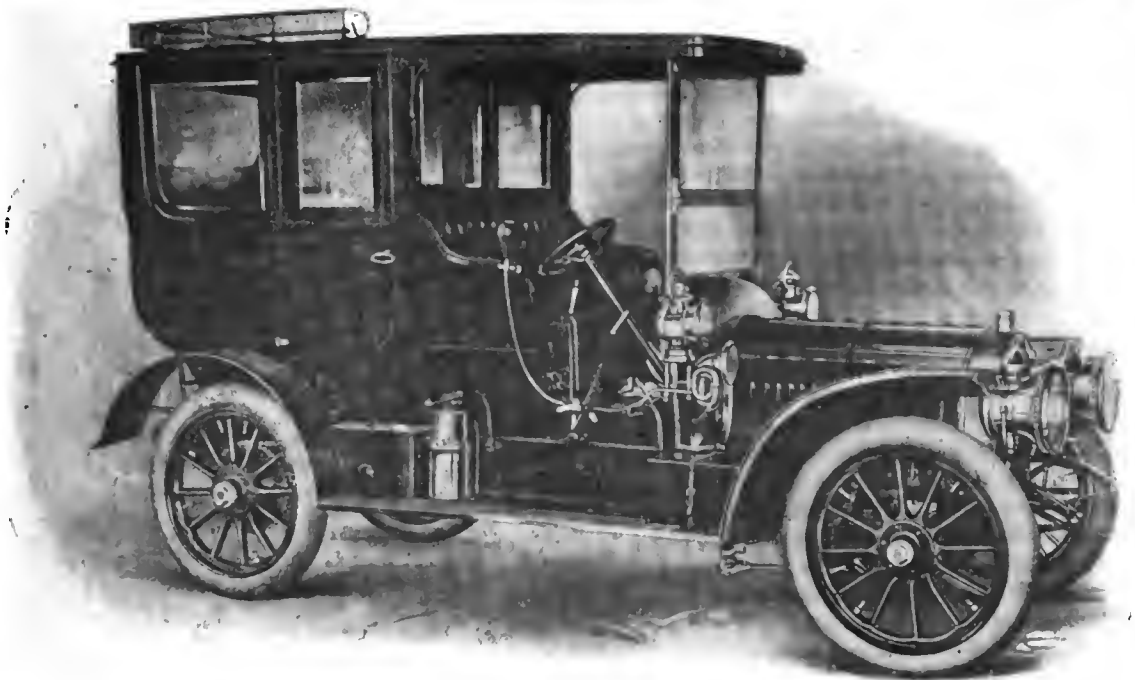
PIERCE GREAT ARROW, 66-H.P., 6 CYLINDERS, PRICE \$6,500.
George N. Pierce Co., Buffalo, N. Y.



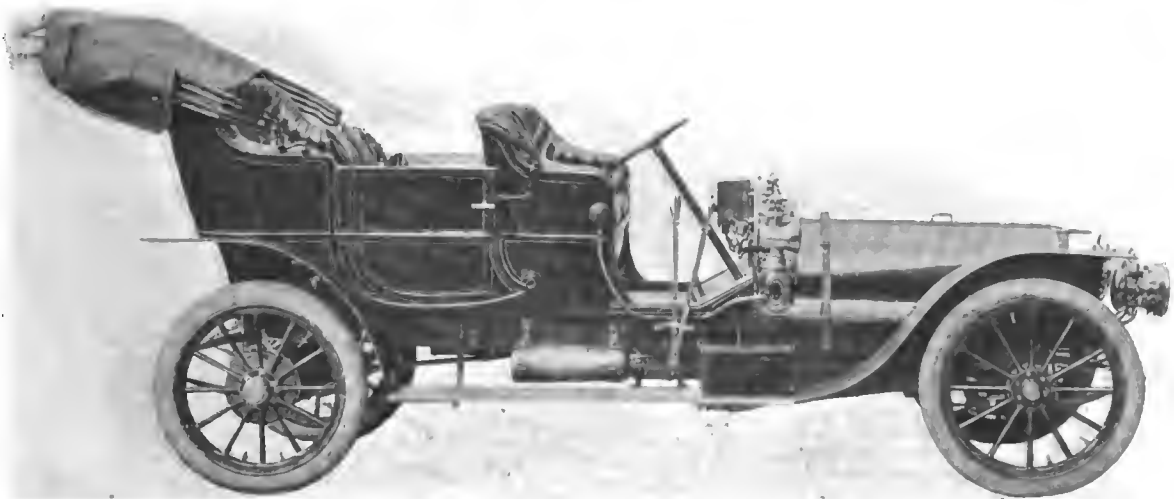
LOCOMOBILE MODEL H, 35-H.P., 4 CYLINDERS, PRICE \$4,500.
Locomobile Company of America, Bridgeport, Conn.



PEERLESS MODEL 16 LIMOUSINE, 45-H.P., 4 CYLINDERS, PRICE \$5,000.
Peerless Motor Car Co., Cleveland, O.



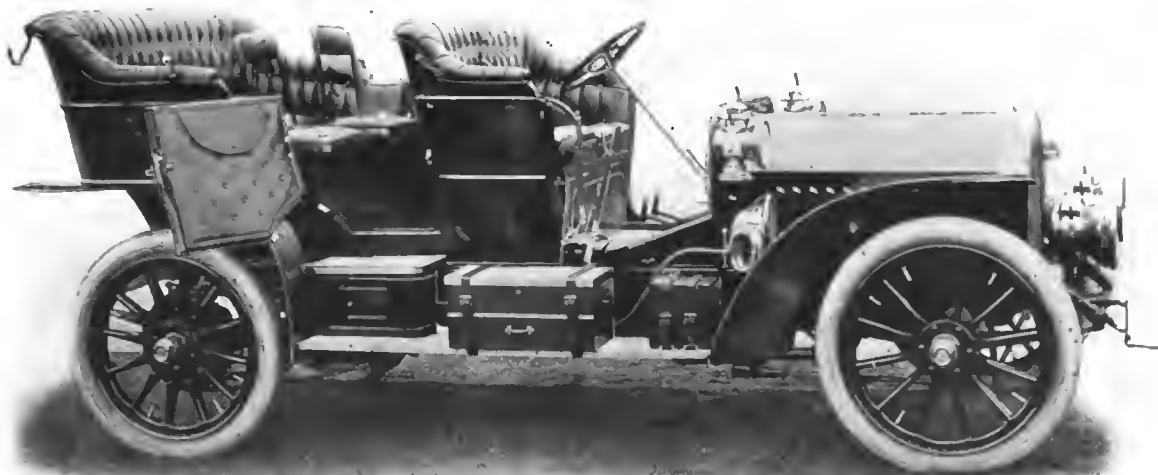
THOMAS FLYER LIMOUSINE, 60-H.P., 4 CYLINDERS, PRICE \$5,200.
E. R. Thomas Motor Co., Buffalo, N. Y.



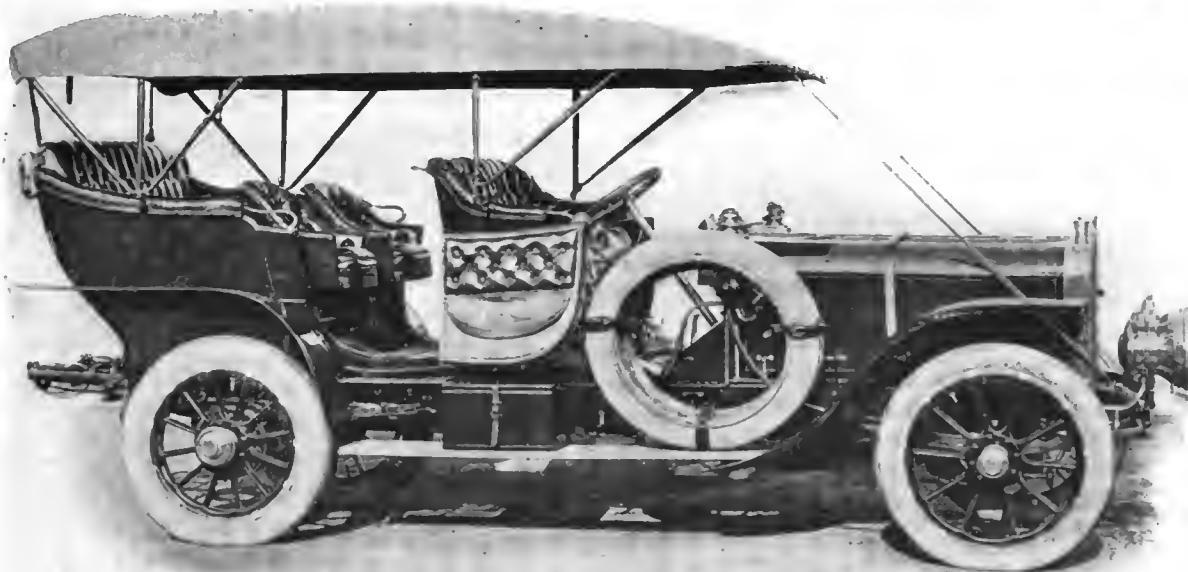
FRANKLIN MODEL H, 30-H.P., 6 CYLINDERS, PRICE \$4,000.
H. H. Franklin Mfg. Co., Syracuse, N. Y.



ROYAL MODEL A LIMOUSINE, 45-H.P., 4 CYLINDERS, PRICE \$5,000.
Royal Motor Car Co., Cleveland, O.



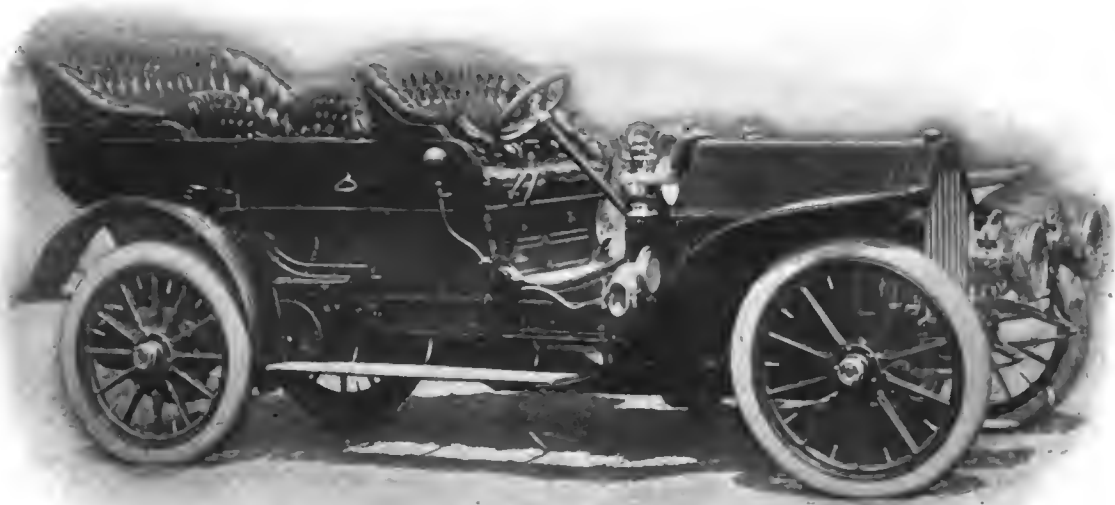
COLUMBIA MARK XLIX, 40 to 45-H.P., 4 CYLINDERS, PRICE \$4,500.
Electric Vehicle Co., Hartford, Conn.



STEVENS-DURYEA "BIG 6," 50-H.P., 6 CYLINDERS, PRICE \$6,000.
Stevens Arms & Tool Co., Chicopee Falls, Mass.



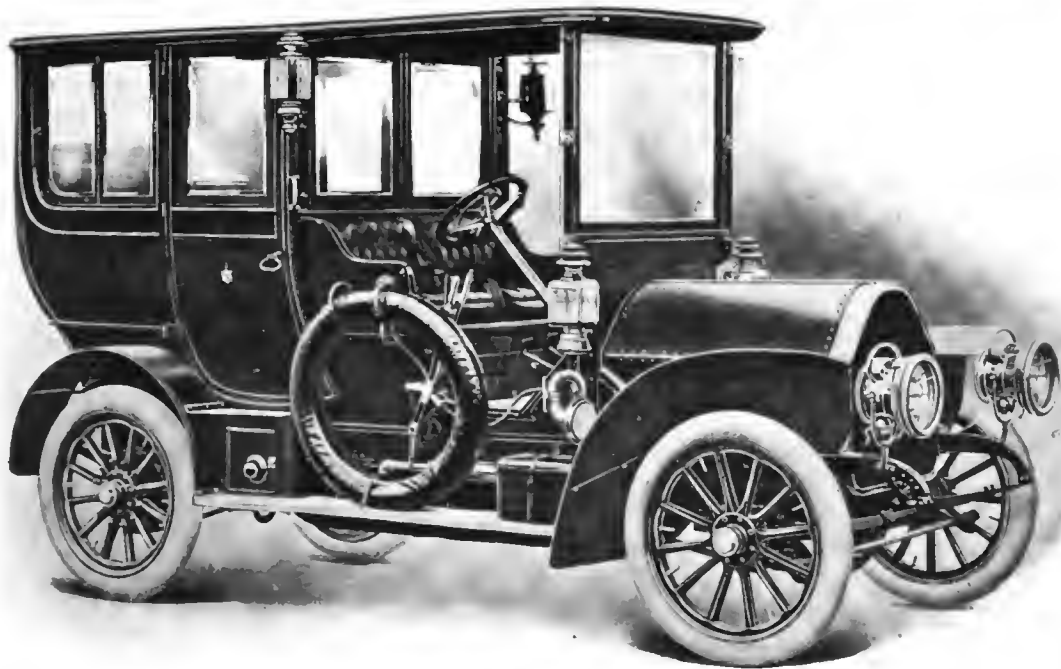
LOZIER LIMOUSINE, 40-H.P., 4 CYLINDERS, PRICE \$6,000.
Lozier Motor Co., New York City.



POPE-TOLEDO MODEL XV TOURING CAR, 50-H.P., 4 CYLINDERS, PRICE \$4,250.
Pope Motor Car Co., Toledo, O.



WALTER LIMOUSINE, 40-H.P., 4 CYLINDERS, PRICE \$6,000.
Walter Automobile Co., Trenton, N. J.



KNOX MODEL G LIMOUSINE, 35 TO 40-H.P., 4 CYLINDERS, PRICE \$5,000.
Knox Automobile Co., Springfield, Mass.



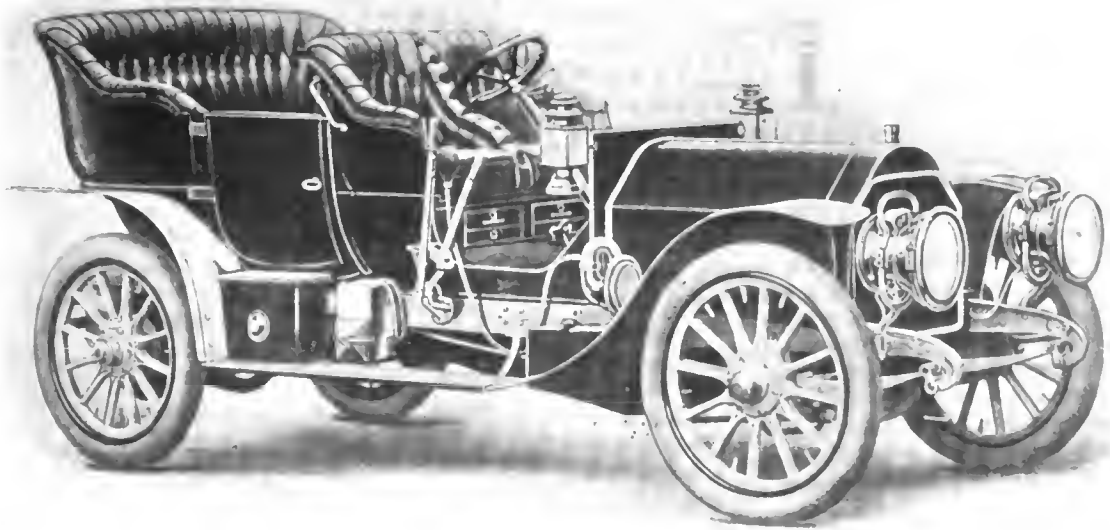
HEWITT TOURING CAR, 50 TO 60-H.P., 8 CYLINDERS, PRICE \$5,500.
Hewitt Motor Co., New York City.



OLDSMOBILE LIMOUSINE, 40-H.P., 4 CYLINDERS, PRICE \$3,800.
Olds Motor Works, Lansing, Mich.



POPE-HARTFORD MODEL L, 25 TO 30-H.P., 4 CYLINDERS, PRICE \$2,750.
Pope Manufacturing Co., Hartford, Conn.



STEARNS TOURING CAR, 30 TO 60-H.P., 4 CYLINDERS, PRICE \$4,500.
F. B. Stearns Co., Cleveland, O.



MATHESON TOURING CAR, 50-H.P., 4 CYLINDERS, PRICE \$5,500.
Matheson Motor Car Co., Wilkesbarre, Pa.



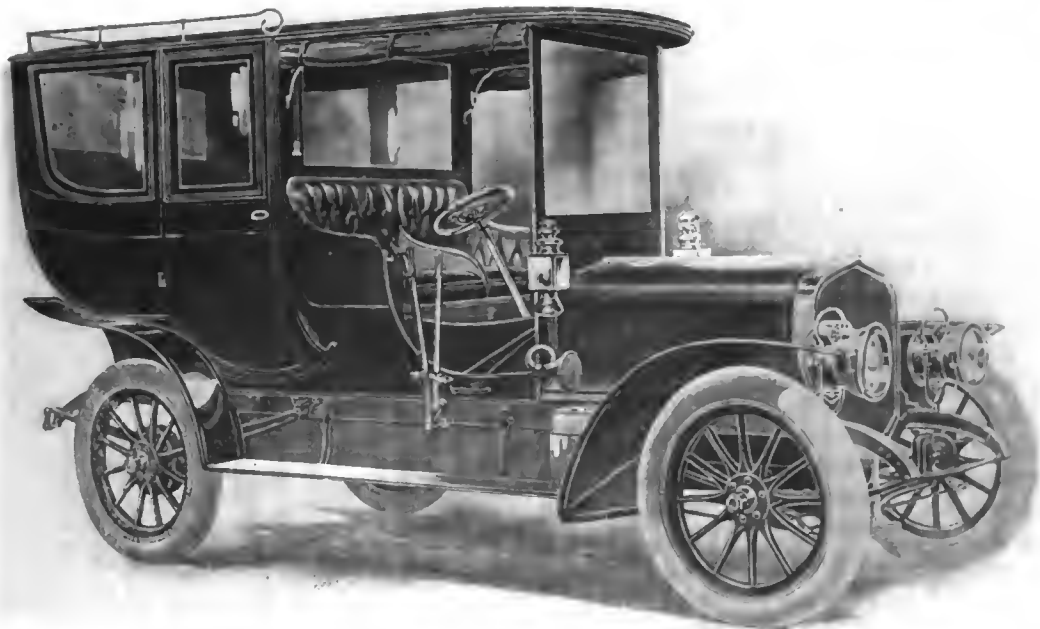
HAYNES MODEL T LIMOUSINE, 50-H.P., 4 CYLINDERS, PRICE \$4,500.
Haynes Automobile Co., Kokomo, Ind.



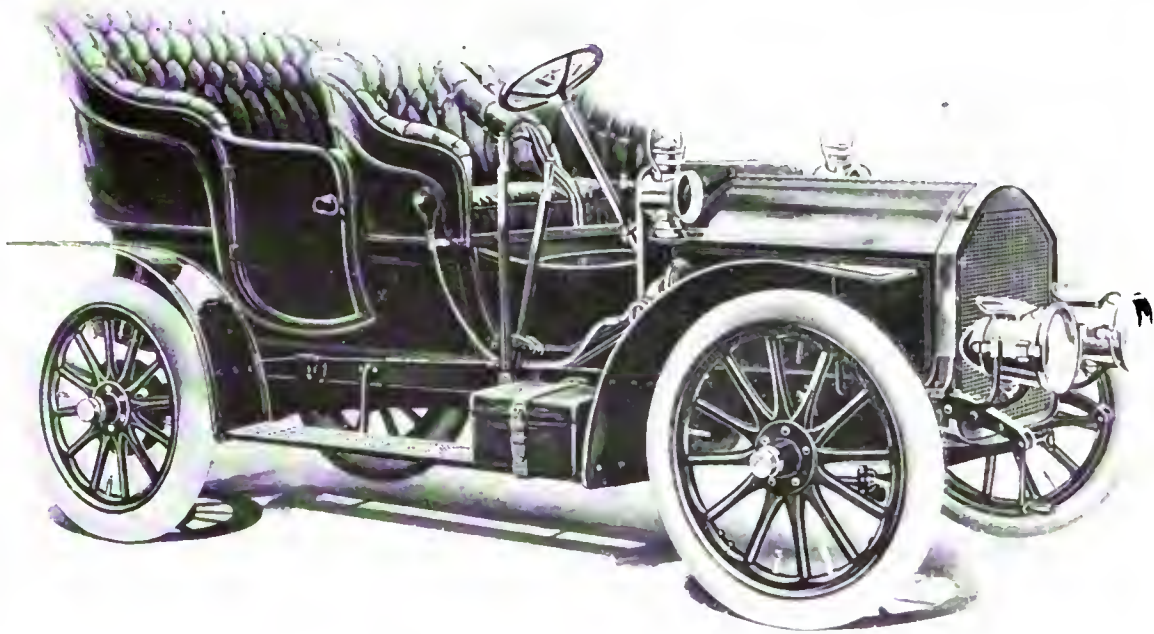
NORTHERN MODEL C LIMOUSINE, 20-H.P., 2 CYLINDERS, PRICE \$2,800.
Northern Motor Car Co., Detroit, Mich.



SIMPLEX LIMOUSINE, 30 TO 35-H.P., 4 CYLINDERS, PRICE \$6,500.
Smith & Mabley, Inc., New York City.



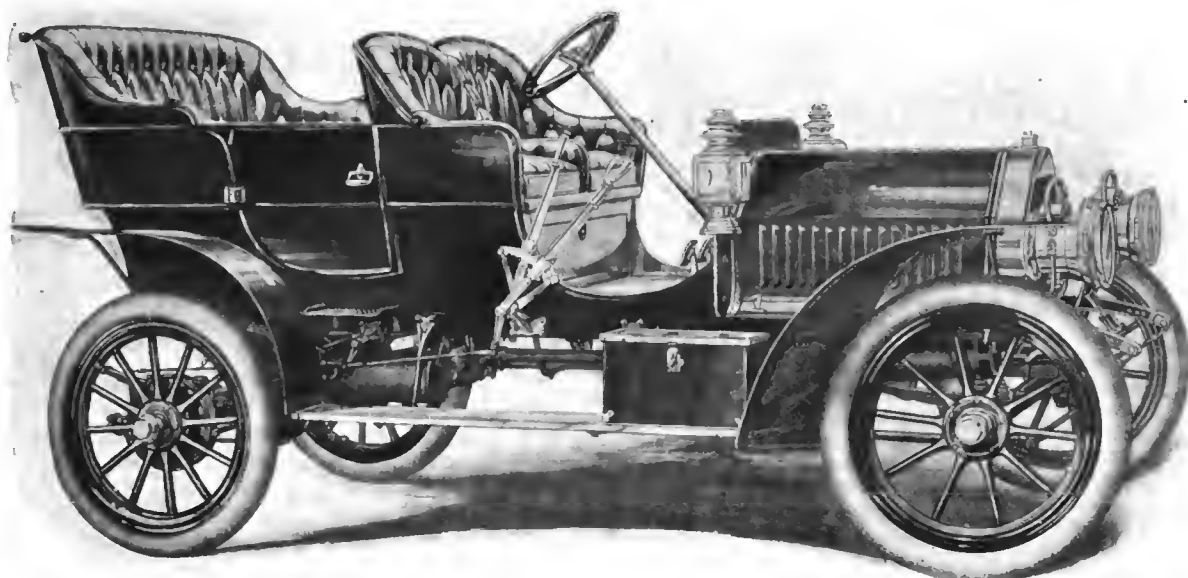
CORBIN MODEL H LIMOUSINE, 24-H.P., 4 CYLINDERS, PRICE \$3,500.
Corbin Motor Vehicle Corp., New Britain, Conn.



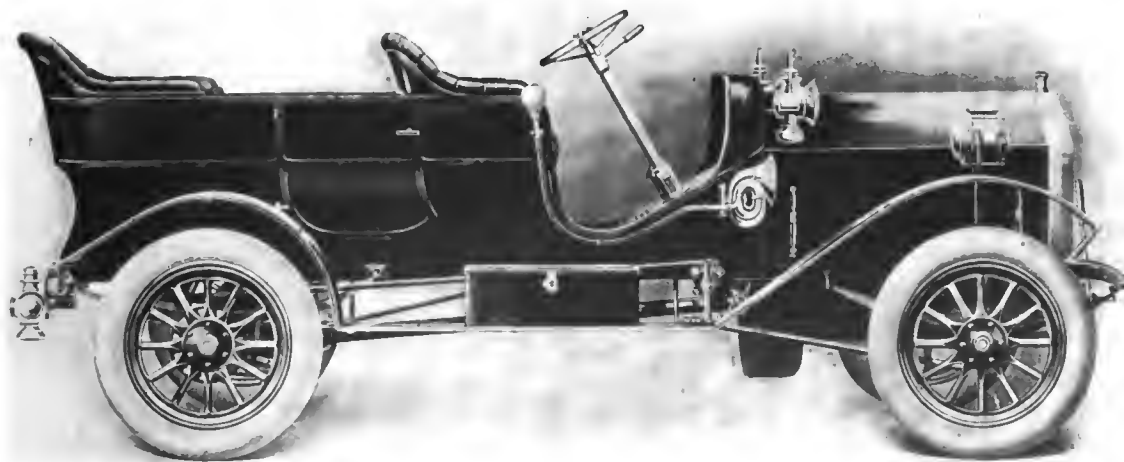
WALTHAM ORIENT TOURING CAR, 20-H.P., 4 CYLINDERS, PRICE \$1,750.
Waltham Manufacturing Co., Waltham, Mass.



FRANKLIN MODEL D, 20-H.P., 4 CYLINDERS, PRICE \$2,800.
H. H. Franklin Mfg. Co., Syracuse, N. Y.



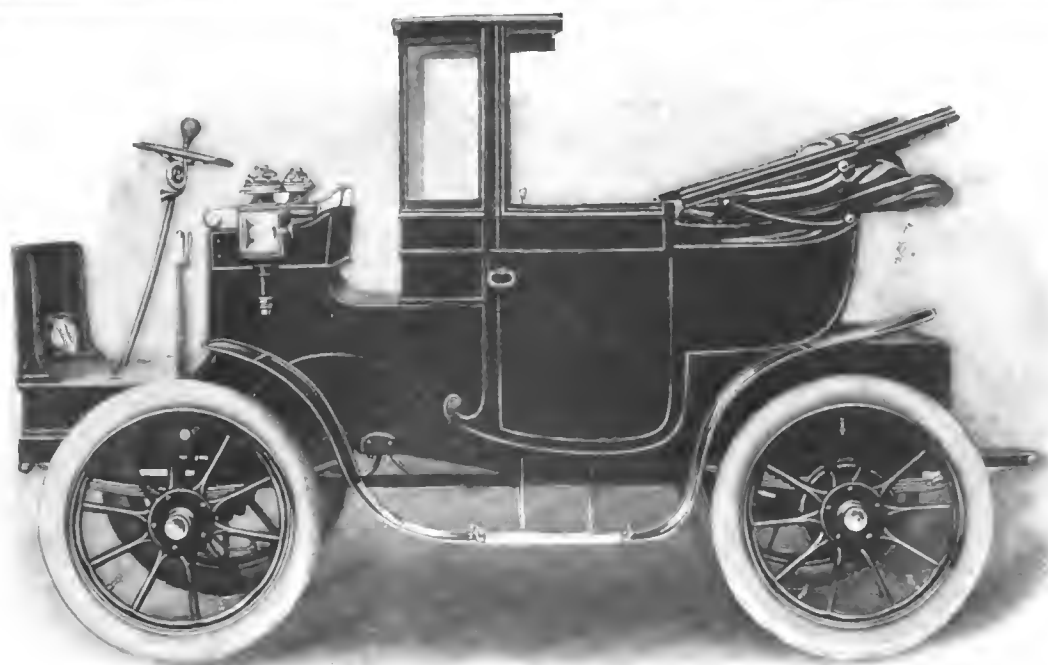
CADILLAC MODEL G, 20-H.P., 4 CYLINDERS, PRICE \$2,000.
Cadillac Motor Car Co., Detroit, Mich.



NORTHERN MODEL L, 50-H.P., 4 CYLINDERS, PRICE \$3,500.
Northern Motor Car Co., Detroit, Mich.



COLUMBUS ELECTRIC INSIDE-DRIVEN COUPE, PRICE \$1,900.
Columbus Buggy Co., Columbus, O.



BAKER ELECTRIC LANDAULET, PRICE \$4,000.
Baker Motor Vehicle Co., Cleveland, O.



BABCOCK ELECTRIC BROUGHAM MODEL 7, PRICE \$4,000.
Babcock Electric Carriage Co., Buffalo, N. Y.



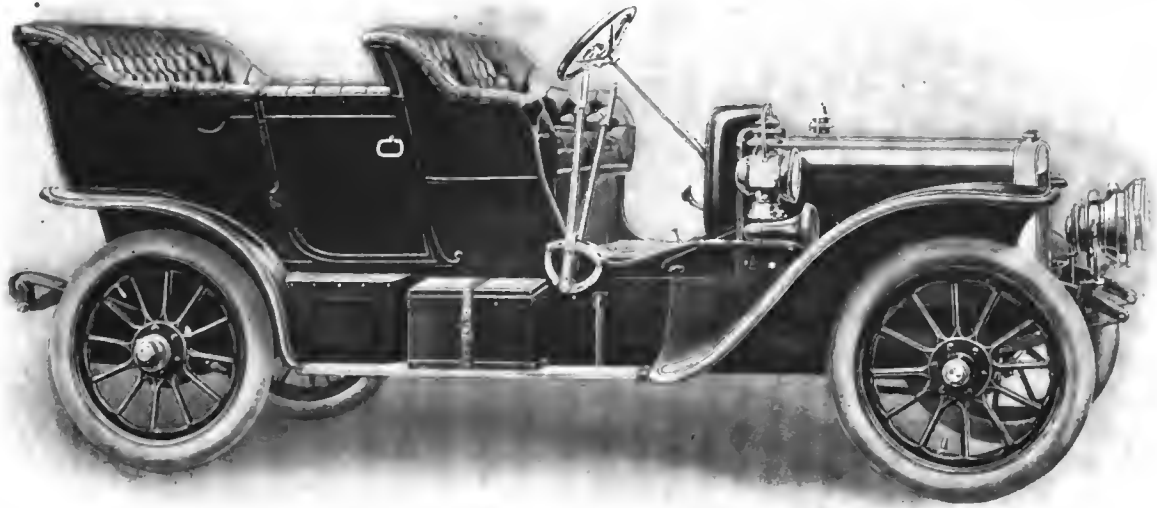
COLUMBIA MARK LXVIII ELECTRIC BROUGHAM, PRICE \$4,000.
Electric Vehicle Co., Hartford, Conn.



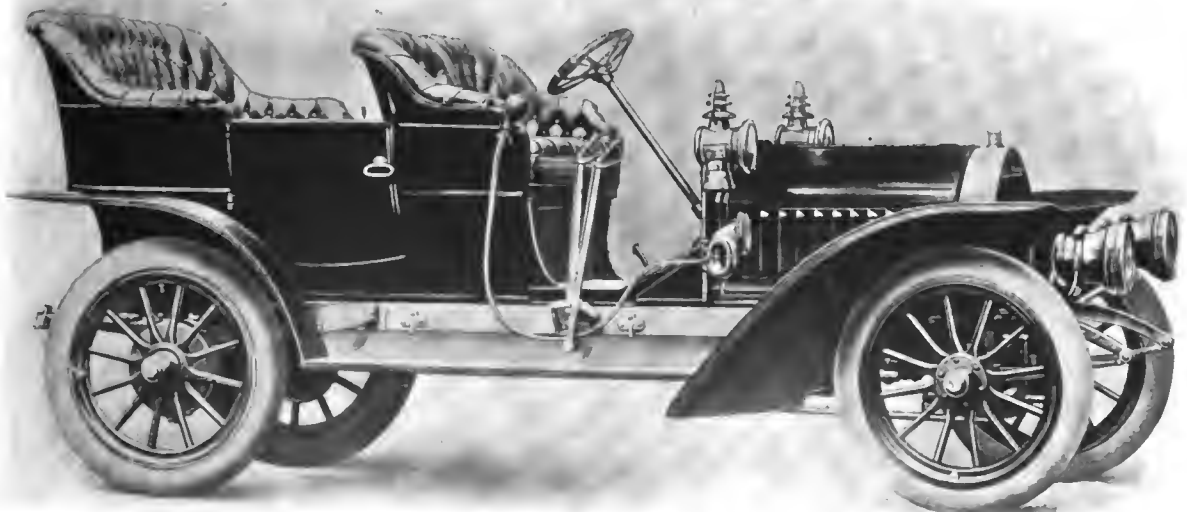
**THOMAS "FORTY," 40-H.P., 4 CYLINDERS, PRICE \$2,750.
E. R. Thomas Detroit Co., Detroit, Mich.**



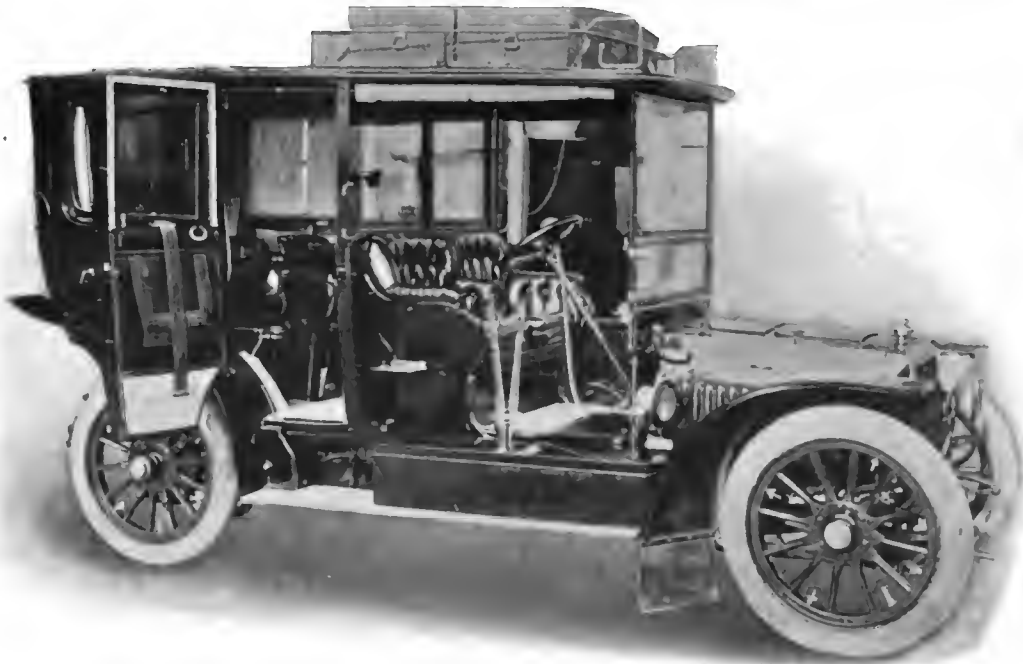
**OLDSMOBILE TOURING CAR, 40-H.P., 4 CYLINDERS, PRICE \$2,750.
Olds Motor Works, Lansing, Mich.**



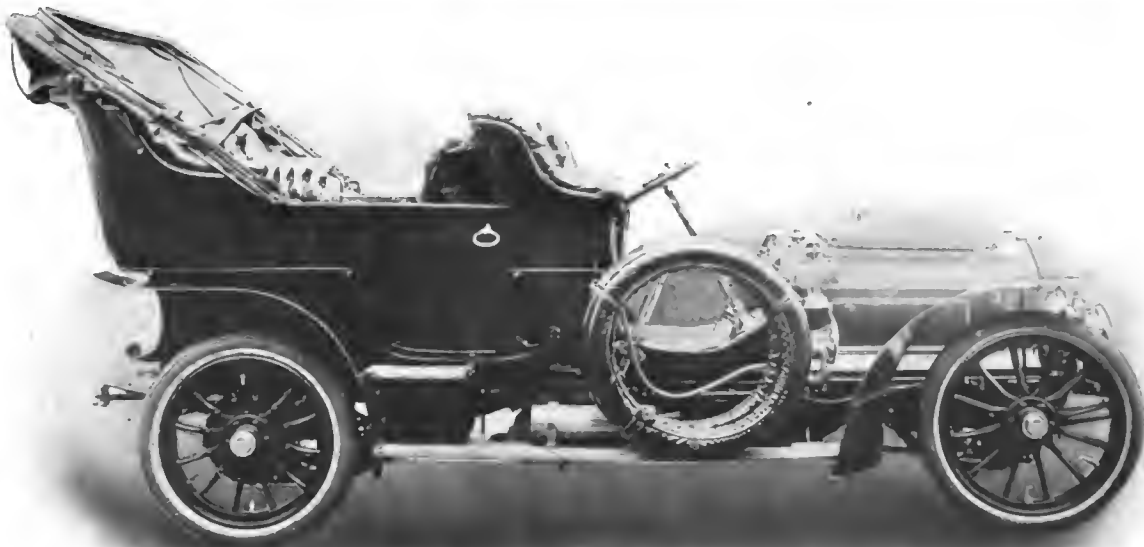
WINTON MODEL M, 40-H.P., 4 CYLINDERS, PRICE \$3,500.
Winton Motor Carriage Co., Cleveland, O.



AUTOCAR TYPE XIV, 30-H.P., 4 CYLINDERS, PRICE \$3,000.
Autocar Company, Ardmore, Pa.



PANHARD LIMOUSINE, 24-H.P., 4 CYLINDERS, PRICE \$6,000 (CHASSIS).
Smith & Mabley, Inc., New York City.



CLEMENT-BAYARD TOURING CAR, 45-H.P., 4 CYLINDERS, PRICE \$8,750.
Sidney B. Bowman Auto Co., New York City.



ISOTTA-FRASCHINI TOURING CAR, 35-H.P., 4 CYLINDERS, PRICE \$7,000.
Smith & Mabley, Inc., New York City.



FIAT CONVEX PHAETON, 35-H.P., 4 CYLINDERS, PRICE \$7,500 (CHASSIS).
Hol-Tan Company, New York City.



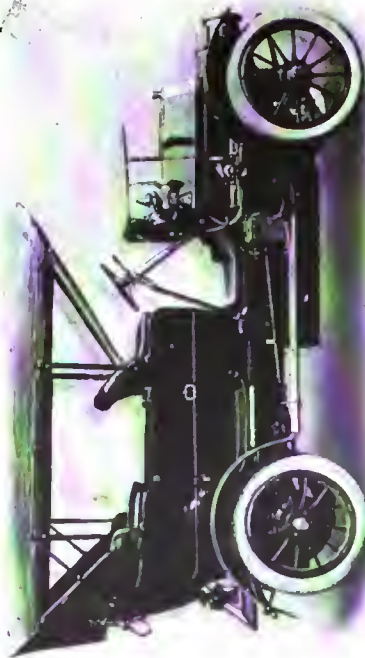
FIAT RUNABOUT, 50-H.P., 4 CYLINDERS, PRICE \$12,000.
 Hol-Tan Company, New York City.



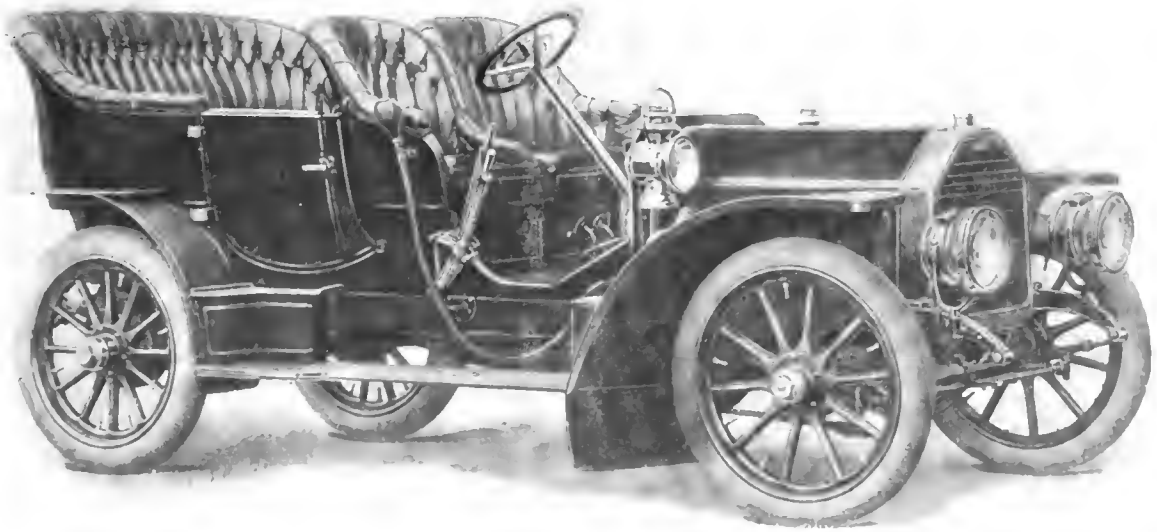
ORIENT MODELER, 4-H.P., 1 CYLINDER, PRICE \$475.
 Waltham Manufacturing Co., Waltham, Mass.



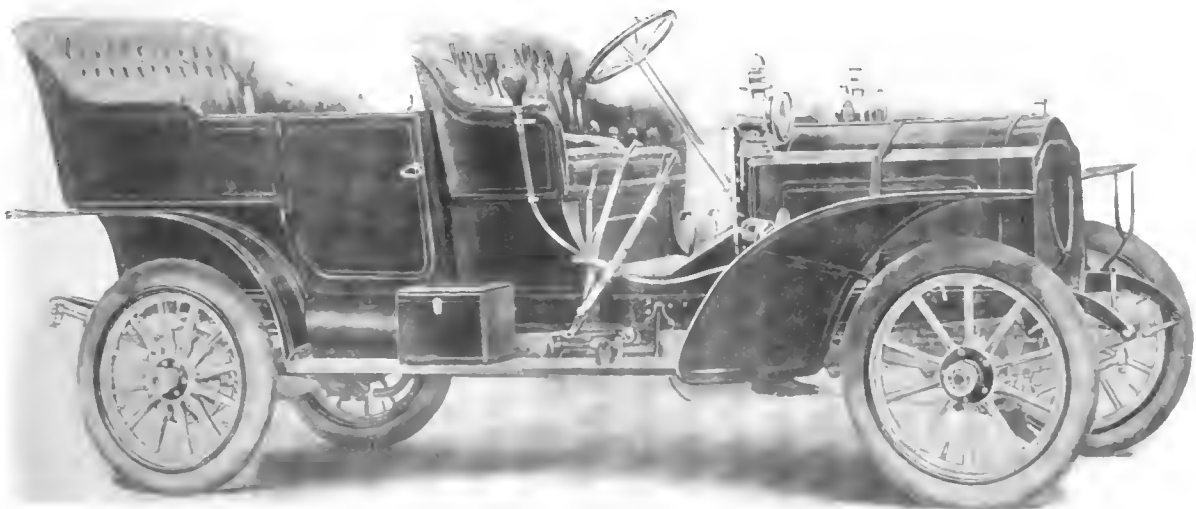
AUTOCAR TYPE XV, 14-H.P., 2 CYLINDERS, PRICE \$1,200.
 Autocar Company, Ardmore, Pa.



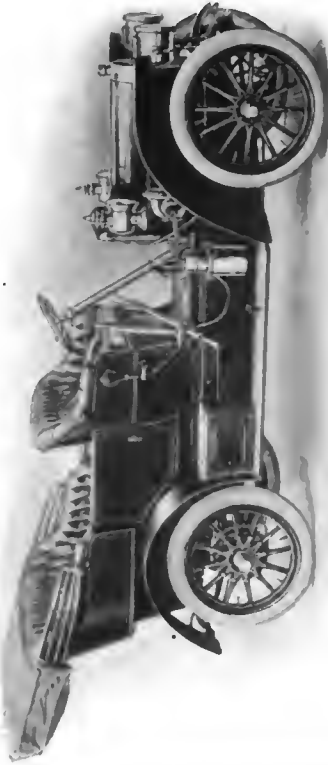
PIERCE GREAT ARROW TOURING CAR, 30-H.P., 4 CYLINDERS,
PRICE \$4,000.
 George N. Pierce Co., Buffalo, N. Y.



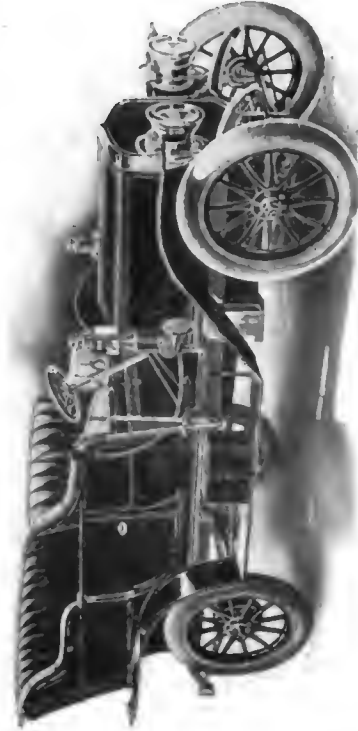
PEERLESS MODEL 15, 30-H.P., 4 CYLINDERS, PRICE \$4,000.
Peerless Motor Car Co., Cleveland, O.



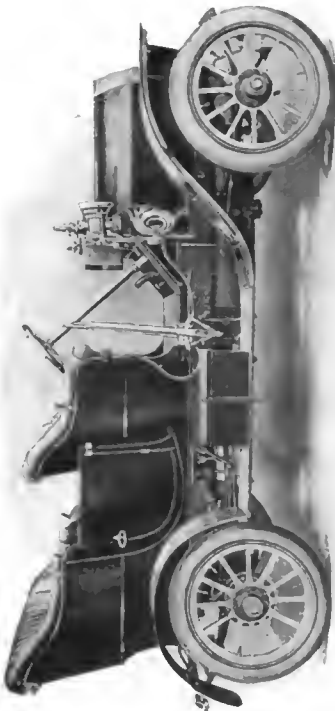
PACKARD TOURING CAR, 30-H.P., 4 CYLINDERS, PRICE \$4,200.
Packard Motor Car Co., Detroit, Mich.



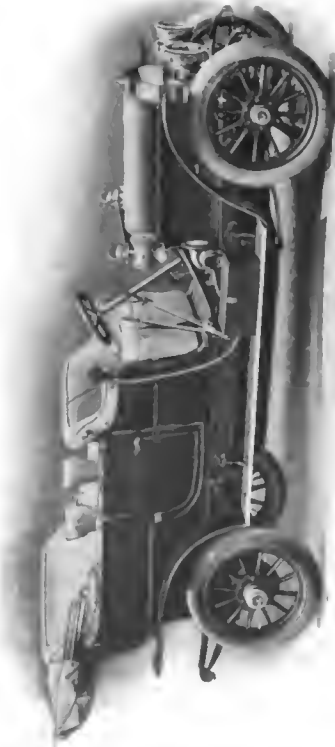
**LOCOMOBILE TYPE E TOURING CAR, 20-H.P., 4 CYLINDERS,
PRICE \$2,800.**
Locomobile Company of America, Bridgeport, Conn.



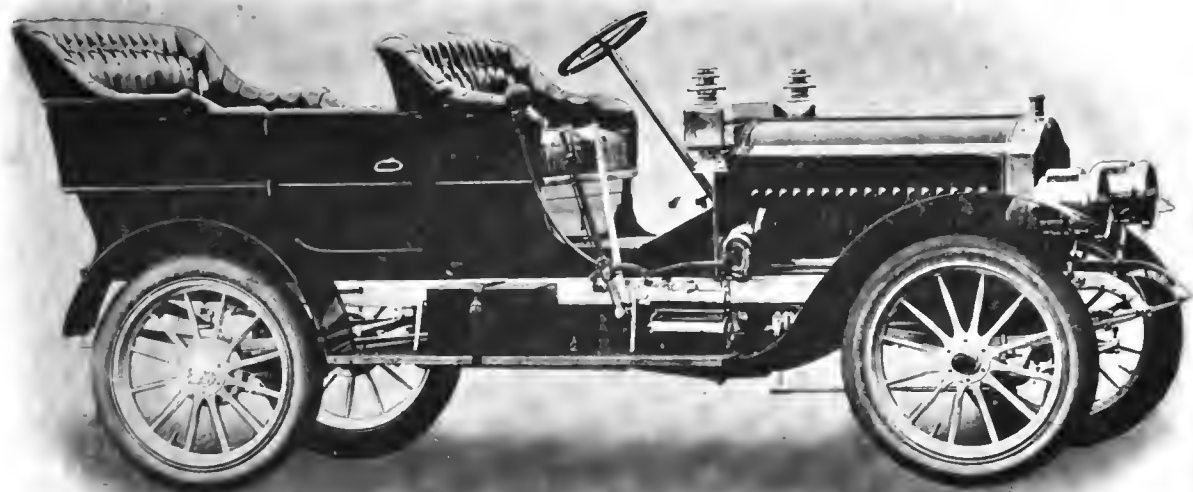
**CORBIN MODEL H TOURING CAR, 24-H.P., 4 CYLINDERS,
PRICE \$2,500.**
Corbin Motor Vehicle Corp., New Britain, Conn.



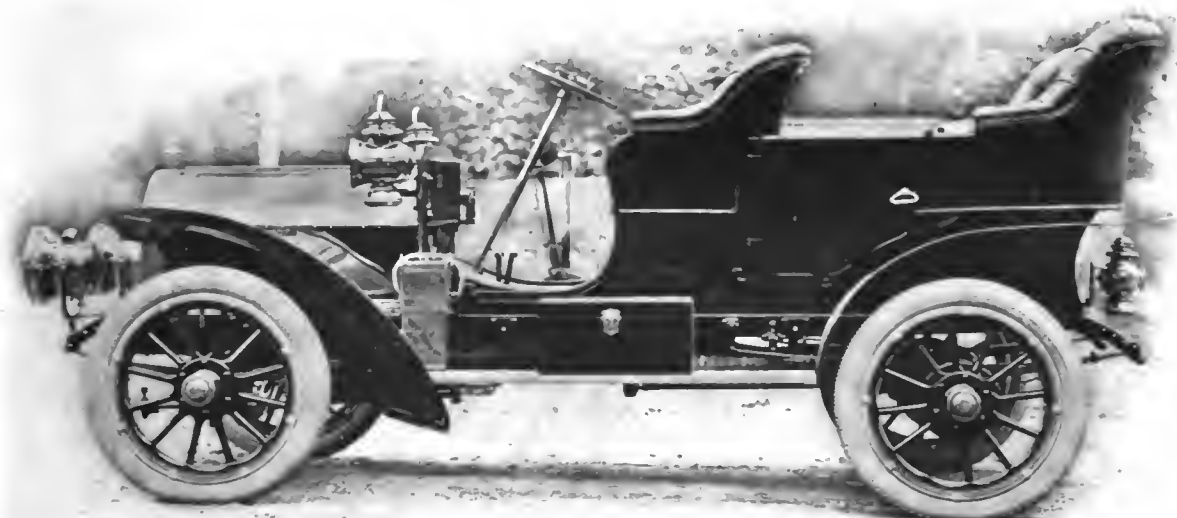
**KNOX MODEL H TOURING CAR, 25 TO 30-H.P., 4 CYLINDERS,
PRICE \$2,500.**
Knox Automobile Co., Springfield, Mass.



WALTER TOURING CAR, 50-H.P., 4 CYLINDERS, PRICE \$6,500.
Walter Automobile Co., Trenton, N. J.



ELMORE MODEL 18 TOURING CAR, 35-H.P., 4 CYLINDERS, PRICE \$2,500.
Elmore Manufacturing Co., Clyde, O.



STEVENS-DURYEA MODEL R TOURING CAR, 20-H.P., 4 CYLINDERS, PRICE \$2,500.
Stevens-Duryea Co., Chicopee Falls, Mass.



**FRANKLIN MODEL G RUNABOUT, 12-H.P., 4 CYLINDERS,
PRICE \$1,850.**

H. H. Franklin Mfg. Co., Syracuse, N. Y.



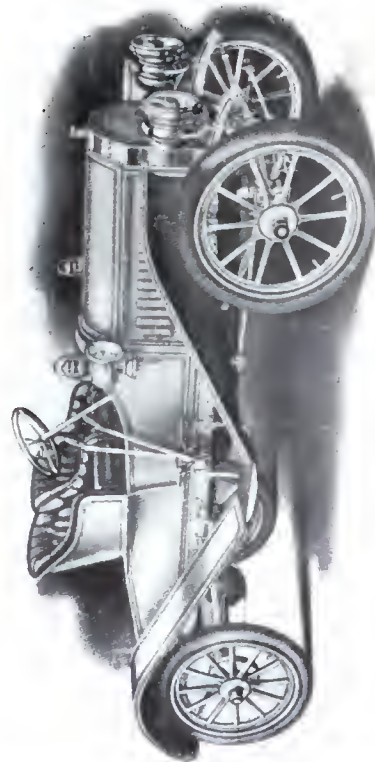
**POPE-TRIBUNE MODEL X RUNABOUT, 16 TO 20-H.P., 4
CYLINDERS, PRICE \$1,750.**

Pope Mfg. Co., Hagerstown, Md.



**NORTHERN MODEL C RUNABOUT, 20-H.P., 2 CYLINDERS,
PRICE \$1,600.**

Northern Motor Car Co., Detroit, Mich.



**BUICK MODEL K RUNABOUT, 25 TO 30-H.P., 4 CYLINDERS,
PRICE \$2,000.**

Buick Motor Co., Jackson, Mich.



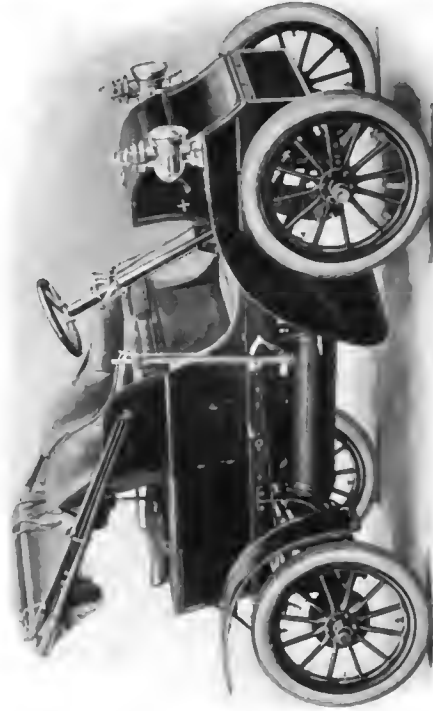
THOMAS FLYER TOURING CAR, 60-H.P., 4 CYLINDERS, PRICE \$4,000, WITHOUT TOP.
E. R. Thomas Motor Co., Buffalo, N. Y.



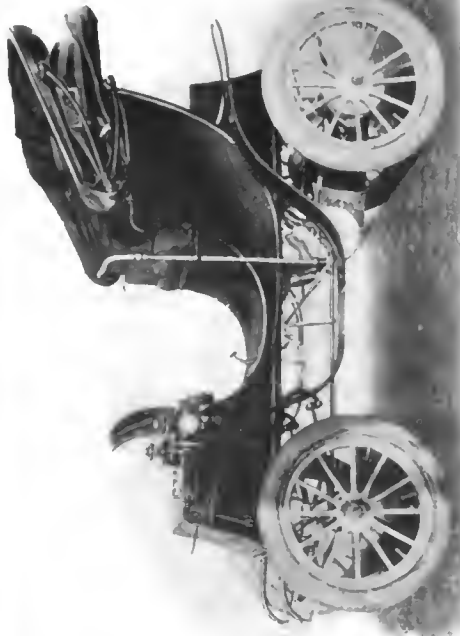
APPERSON LANDAULET, 50-H.P., 4 CYLINDERS, PRICE \$5,600.
Apperson Bros. Automobile Co., Kokomo, Ind.



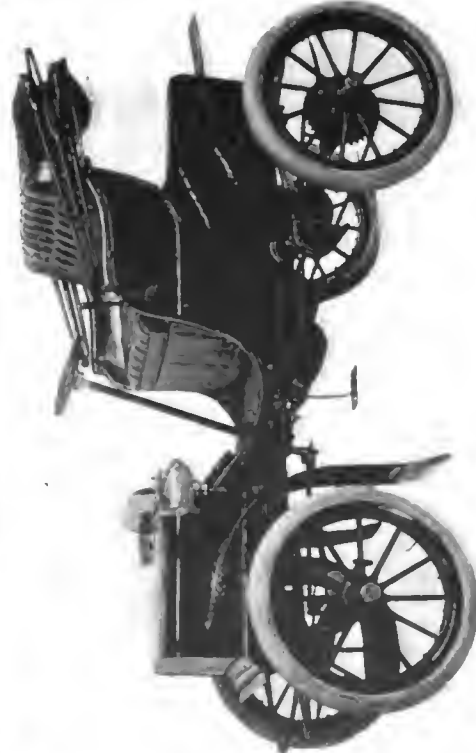
POPE-WAVERLEY MODEL 87 ELECTRIC VICTORIA-PHAETON,
PRICE \$1,600.
Pope Manufacturing Co., Indianapolis, Ind.



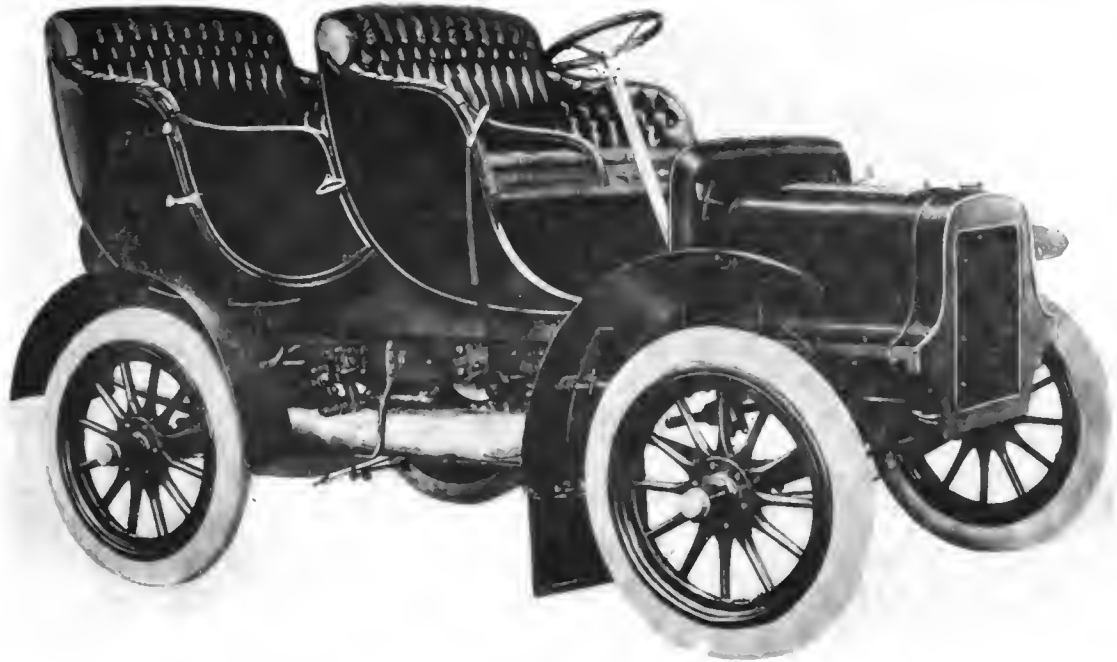
HEWITT RUNABOUT, 10-H.P., 1 CYLINDER, PRICE \$1,000.
Hewitt Motor Co., New York City.



COLUMBIA MARK LXIX ELECTRIC VICTORIA-PHAETON,
PRICE \$1,500.
Electric Vehicle Co., Hartford, Conn.



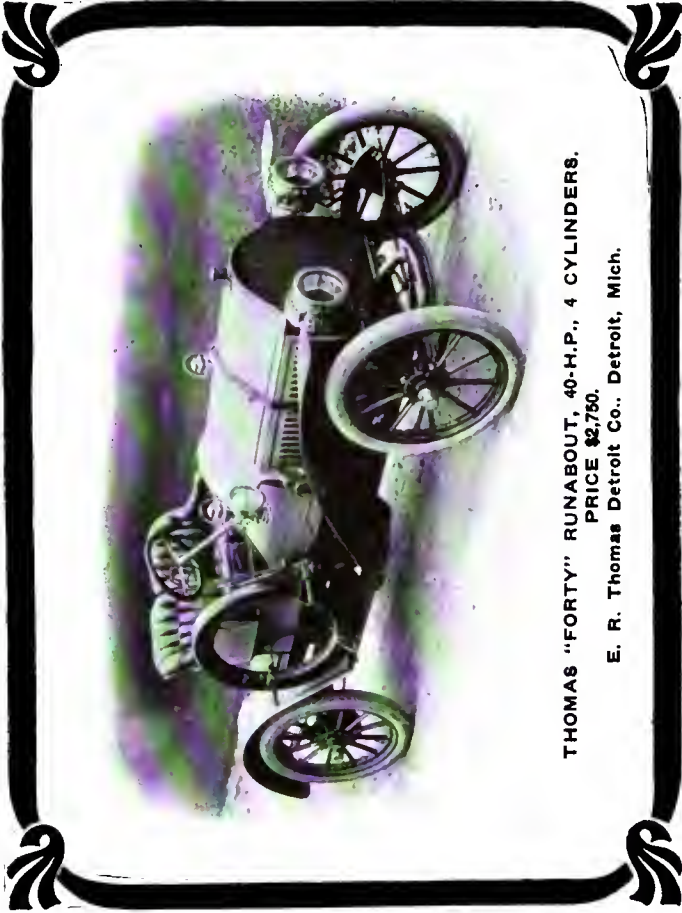
BABCOCK MODEL 5 ELECTRIC ROADSTER, PRICE \$1,400.
Babcock Electric Carriage Co., Buffalo, N. Y.



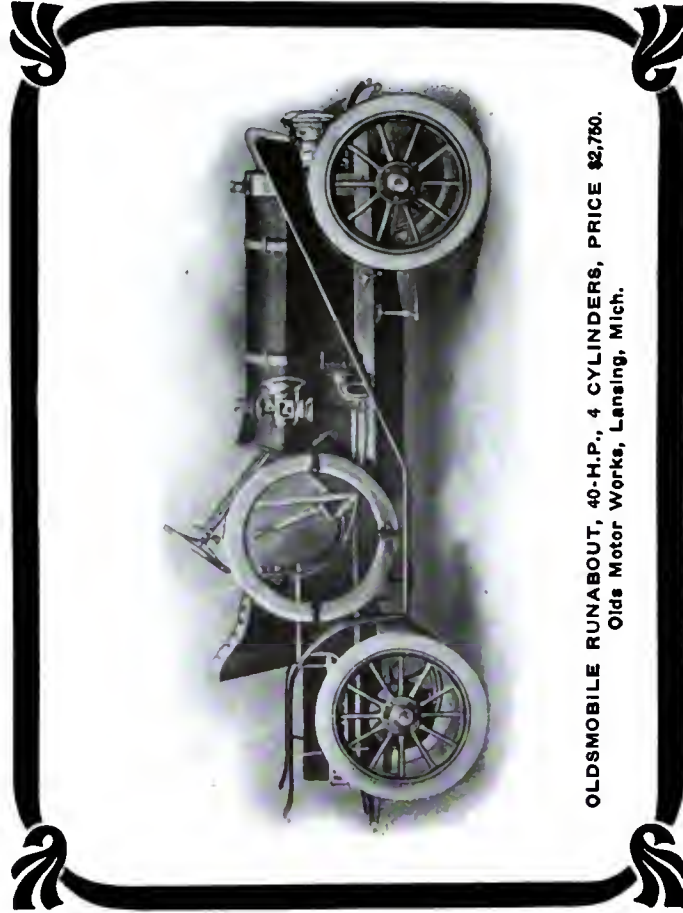
CADILLAC MODEL M TOURING CAR, 10-H.P., 1 CYLINDER, PRICE \$950.
Cadillac Motor Car Co., Detroit, Mich.



COLUMBIA MARK XLVIII LIMOUSINE, 24 TO 28-H.P., 4 CYLINDERS, PRICE \$4,200.
Electric Vehicle Co., Hartford, Conn.



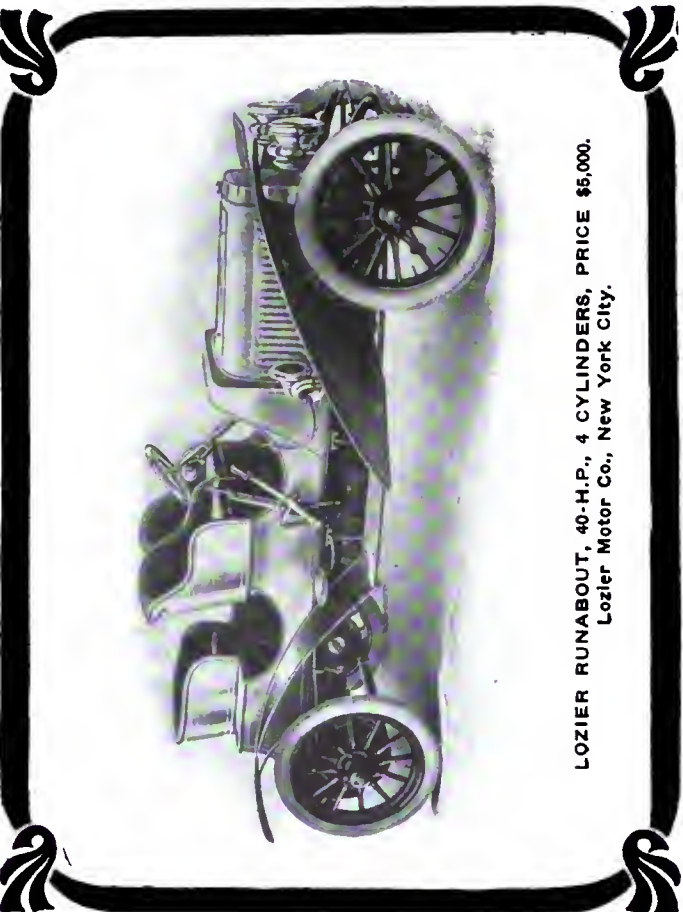
**THOMAS "FORTY" RUNABOUT, 40-H.P., 4 CYLINDERS.
PRICE \$2,750.
E. R. Thomas Detroit Co., Detroit, Mich.**



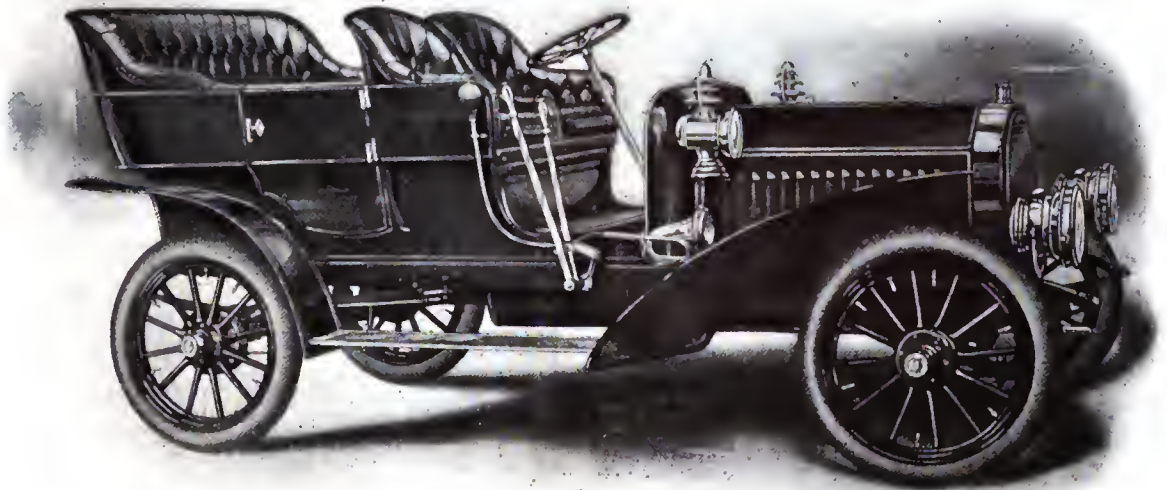
**OLDSMOBILE RUNABOUT, 40-H.P., 4 CYLINDERS, PRICE \$2,750.
Olds Motor Works, Lansing, Mich.**



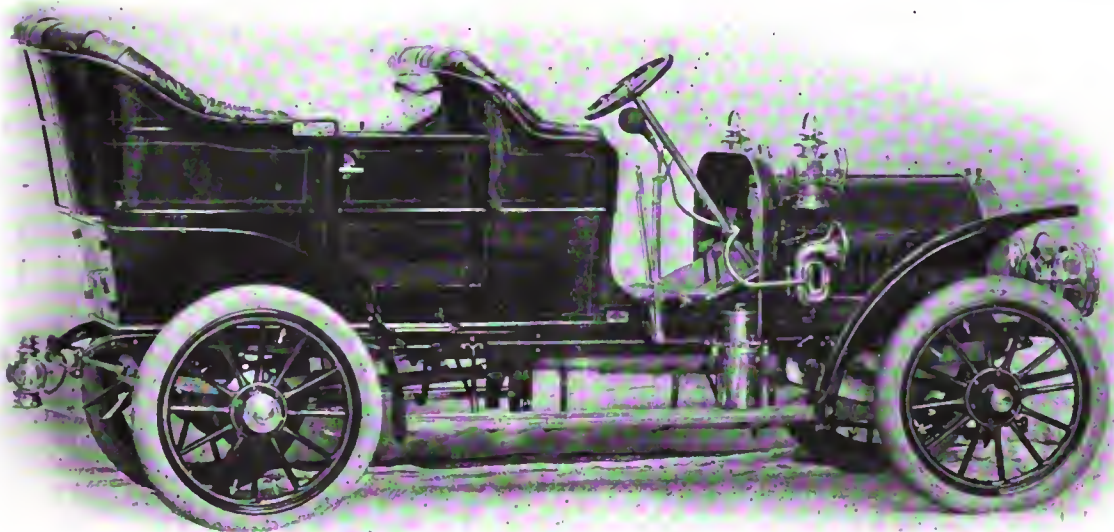
**PACKARD RUNABOUT, 30-H.P., 4 CYLINDERS, PRICE \$4,200.
Packard Motor Car Co., Detroit, Mich.**



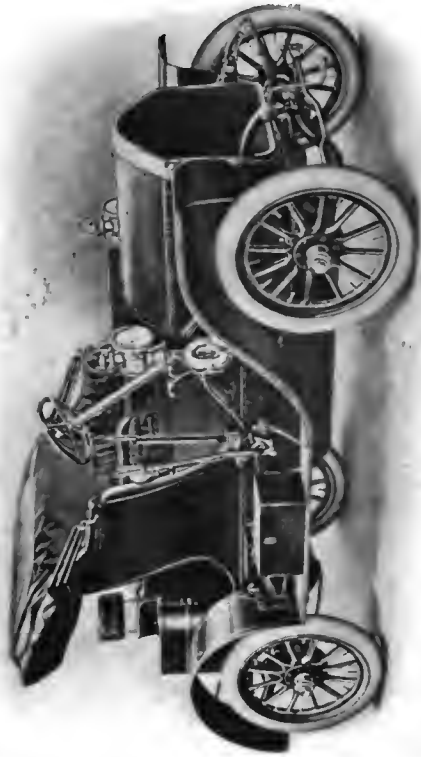
**LOZIER RUNABOUT, 40-H.P., 4 CYLINDERS, PRICE \$5,000.
Lozier Motor Co., New York City.**



BUICK MODEL D TOURING CAR, 25 to 30-H.P., 4-CYLINDERS, PRICE \$2,200.
Buick Motor Co., Jackson, Mich.



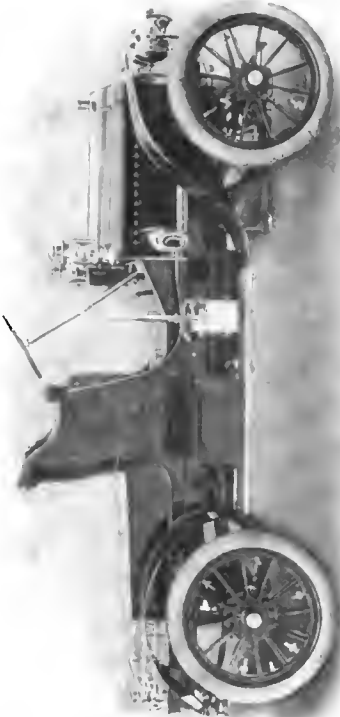
STUDEBAKER MODEL G TOURING CAR, 30 TO 35-H.P., 4 CYLINDERS, PRICE \$4,000.
Studebaker Automobile Co., South Bend, Ind.



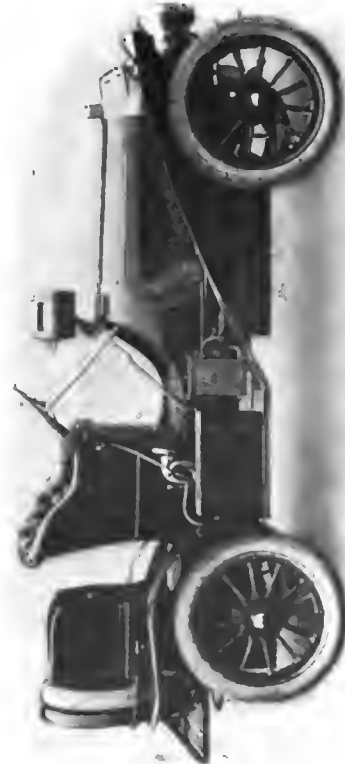
**KNOX MODEL H STANHOPE, 25 to 30-H.P., 4 CYLINDERS,
PRICE \$2,500.**
Knox Automobile Co., Springfield, Mass.



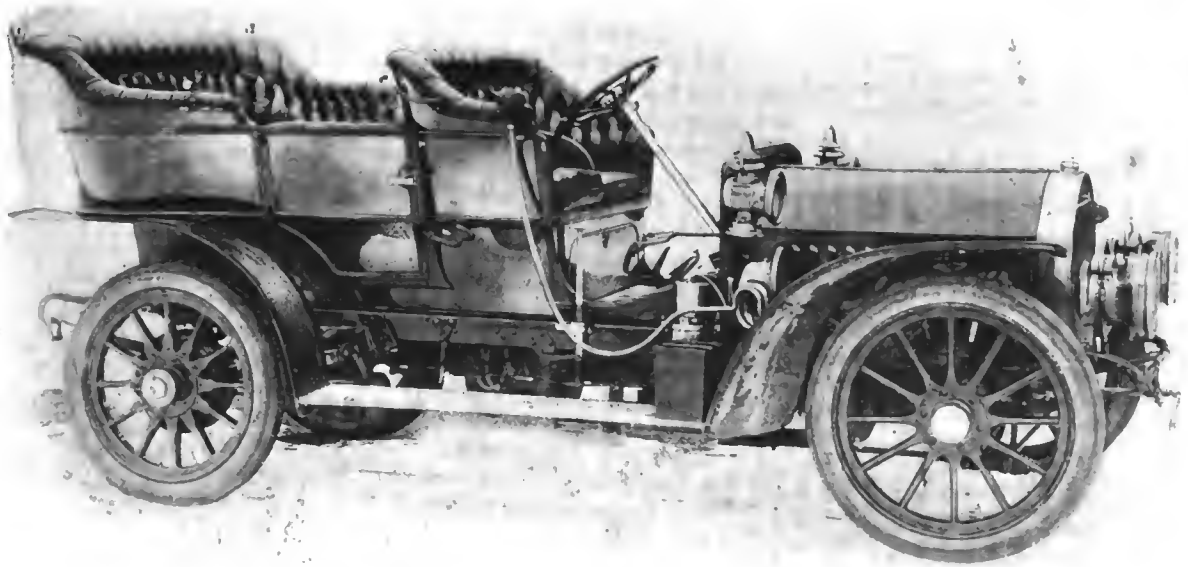
**CADILLAC MODEL K RUNABOUT, 10-H.P., 1 CYLINDER,
PRICE \$800.**
Cadillac Motor Car Co., Detroit, Mich.



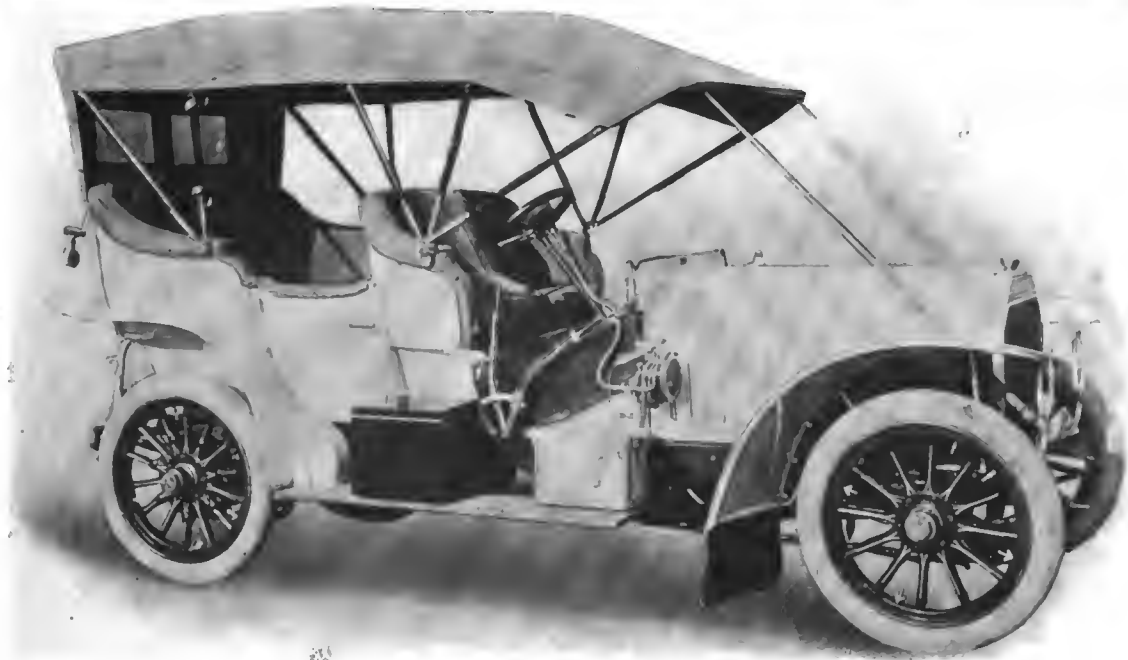
**ELMORE TWO-CYCLE RUNABOUT, 24-H.P., 3 CYLINDERS,
PRICE \$1,750.**
Elmore Mfg. Co., Clyde, O.



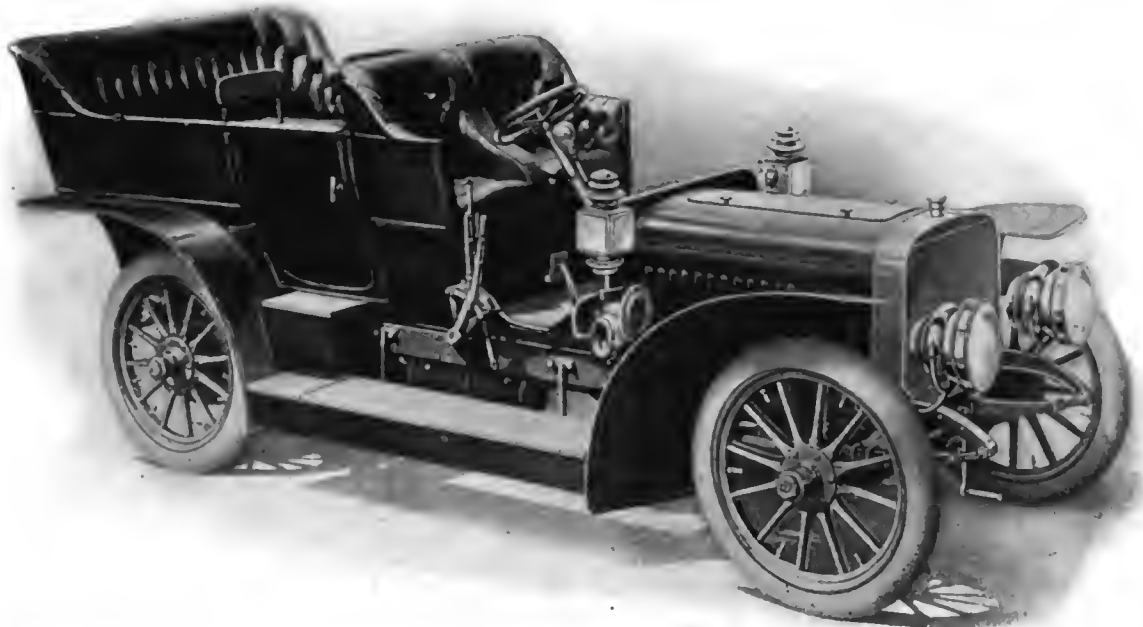
**HAYNES MODEL S RUNABOUT, 35-H.P., 4 CYLINDERS,
PRICE \$2,400.**
Haynes Automobile Co., Kokomo, Ind.



COLUMBIA MARK 66 COMBINATION GASOLINE-ELECTRIC TOURING CAR, PRICE \$7,500.
Electric Vehicle Co., Hartford, Conn.



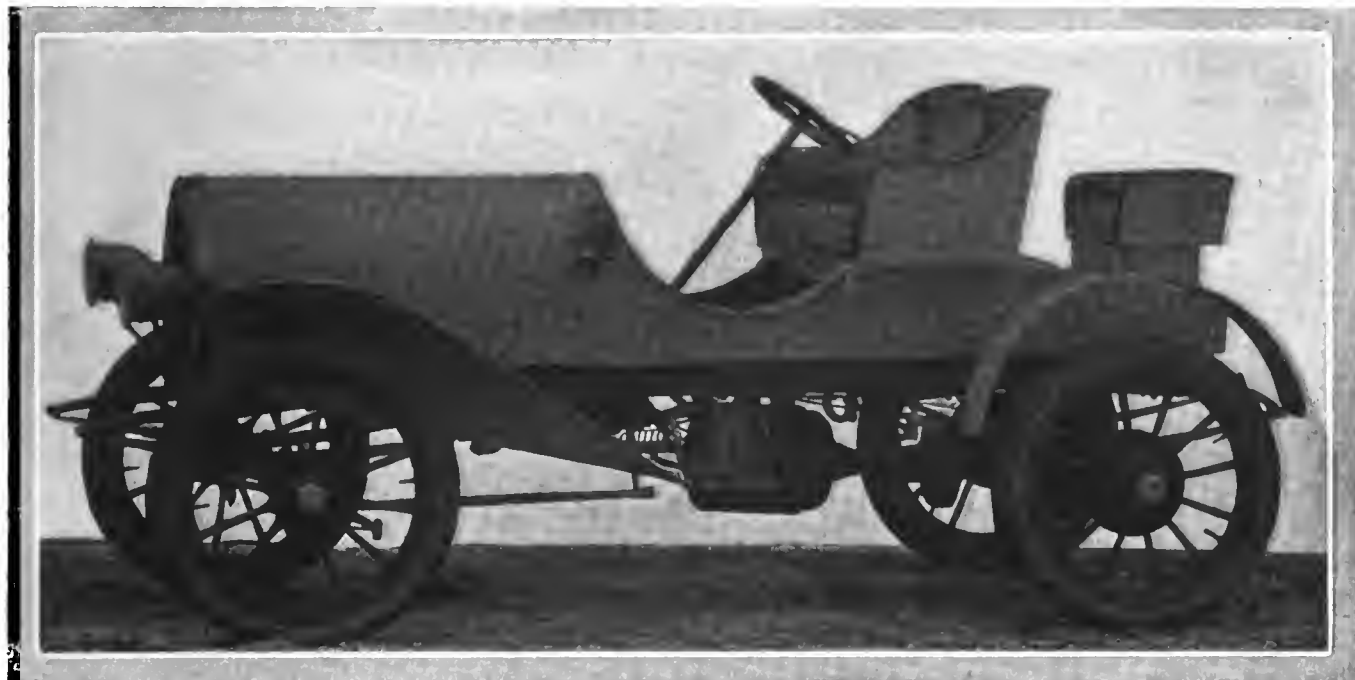
PANHARD TOURING CAR, 50-H.P., 4 CYLINDERS, PRICE \$8,050 (CHASSIS).
Smith & Mabley, Inc., New York City.



LOZIER TOURING CAR, 60-H.P., 4 CYLINDERS, PRICE \$7,000.
Lozier Motor Co., New York City.



PIERCE GREAT ARROW TOURING CAR, 40 TO 45-H.P., 4 CYLINDERS, PRICE \$5,000.
Geo. N. Pierce Co., Buffalo, N. Y.



BAKER SHAFT-DRIVEN ELECTRIC ROADSTER A LA RACEABOUT, WITH BATTERY UNDER THE BONNET.

THE FIELD OF THE HORSELESS ELECTRICS

LUXURY of appointments, combined with mechanical simplicity and ease of control, are the chief characteristics of the electric vehicle, and they are exemplified in no small degree by the cars now on view in this section of the show. It goes without saying that they represent the product of the best known makers in their line in this country, if not in the world, for the American-made electric vehicle has gained prestige abroad as well as on this side of the Atlantic. The motive power really forms so small and apparently so insignificant a part of the up-to-date electric vehicle that it is scarcely to be wondered at that the ingenuity and lavish disregard of expense displayed in the fitting of the interiors of this type of car should constitute their chief attraction. In all that pertains to the comfort of the occupants, as well as the manner in which both the fitting and finish are executed, it is evident that the builder of the electric vehicle found that the carriage maker had stopped far short of the attainable and had no difficulty in greatly surpassing him—a respect in which he also anticipated the body builder of the gasoline car, although the latter has since come abreast of him, there being little to choose between the appointments of the up-to-date limousine or other inclosed type of body, and the smart electric vehicle.

Where the purely mechanical side is concerned, no one realizes better than the electric vehicle builder himself that progress must necessarily be slow. But at the same time no one realizes the extent of the progress that has been made in storage battery manufacture within the past few years. It is difficult to talk of improvement in this respect to the layman without exaggerating things, and there has been so much misleading information given to the public on the subject in that time that makers have since refrained from calling the public to witness their achievements, except where the latter have been of a radical or revolutionary nature. Compound wound motors of low powers, but capable of standing excessive overloads for long periods, are still characteristic of the power equipment; but there has been more or less change in the manner of applying the power, which is to be noted in the increasing popularity of the single-

motor, shaft-driven type of car. Barring these, and with a few well-known exceptions, most of the cars are chain driven, the former employing gears, which are, however, no longer in general use for this purpose on the ordinary type of electric pleasure vehicle. Another thing noticeable is the extent to which the evolution of the up-to-date gasoline car has aided the builder of the electric, the latter having been able to adopt many of the innovations introduced primarily as constructional features of the gasoline car.

Baker Motor Vehicle Co.—Baker electrics are probably typical of this, in that the *pièce de résistance* of the Baker exhibit is an electric roadster, which at first glance might well be taken for a gasoline car, so closely does its appearance approximate to the latter. It is planned on the lines of the modern high-powered gasoline runabout, with two bucket seats about the center of the wheelbase and the usual dickey seat behind, in this case to the extreme rear and behind the back axle. Steering is by the usual inclined wheel, the steering pillar also carrying the controller lever, the control being placed at the left hand of the car. Forward of this is what appears to be the regulation type of bonnet, sheltering the battery, though it would hardly be suspected of having been placed there for that purpose except upon investigation. Hung quite low and approximately beneath the center of the car in order to bring the center of gravity down is the power plant in the shape of a single electric motor direct connected to a propeller shaft driving the rear wheels through the medium of a bevel gear and live axle. In addition to this roadster, which represents an unusual attraction in the electric field, the Baker interests are also displaying a standard runabout, listing at \$1,800; a brougham of new design and very attractive lines at \$4,000, the option of a landaulet body also being given on the same chassis at the same figure. There is also a stanhope at \$1,600 and a victoria at \$3,000. The batteries in the smaller and lighter vehicles consist of 24 cells and 40 cells in the larger. All are equipped with pneumatic tires, varying in diameter and wheel size in accordance with the weight, the mileage ranging from 40 to 80 miles on a single charge.

Pope Manufacturing Company.—Pope-Waverley electric vehicles are shown in such a wide range of types that it is possible to find in this exhibit, which is one of the largest and most representative of its kind, a car adapted to any purpose within the range of the electric vehicle. The leading car of the exhibit is a dainty stanhope of special design, listing at \$2,000. It carries a battery of 30 cells. The standard type of stanhope is listed at \$1,400 and has the same battery, while a victoria-phaeton at \$1,600 comes between these two. The last named also carries 30 cells of battery, the weight being equalized by placing 10 cells forward and the remainder in a rear compartment. Its body is a special design, on which a patent has been applied for, one of the features being the dropped sill or floor support, materially lessening the distance between the floor of the car and the ground, beside which the seat is broad and low. With the exception of the station wagon, which constitutes an attractive feature of the exhibit, all the types shown are equipped with 30 cells of Exide battery, this having 41, different types of varying capacity being employed in accordance with the needs of the car. As an option, the National cells are also offered. Both the two models of stanhope as well as the victoria-phaeton are equipped with a single motor of high overload capacity, driving the rear wheels through the medium of the special "herring-bone" type of gear, which has always been a distinctive feature of the Pope electric vehicles.

Cantono Electric Tractor Company.—Cantono fore carriages constitute a line which represents quite a departure from the regulation standard type of electric vehicle. As their name indicates, the motive power is concentrated on the forward truck or axle carrying the front wheels, which accordingly act as the drivers, contrary to the usual custom of driving the rear wheels, though in this case the forward wheels also serve for the steering in addition. Two types are shown, a fore-brougham with extension straight front and a fore-landaulet, both of which list at \$3,500. Motors, batteries, controllers and all connections are self-contained on the front part of the car, the wheels of which are accordingly equipped with heavier tires owing to the extra weight and duty imposed upon them. They are equipped with 5-horsepower motors, have a 90 and 96-inch wheelbase, respectively, weigh 3,000 pounds in both instances, and are equipped with 44 cells of battery, giving an effective radius of 40 miles.

Babcock Electric Carriage Company.—Babcock is a name that has stood for electric vehicles in this country almost as long as they have been a feature of the automobile world, so that it is only to be expected that the vehicles turned out under this mark should be representative of the latest achievements in this line, both where electrical efficiency

and refinement of detail in equipment are concerned. Prominent among the models specialized by the makers of this line are to be found a stanhope at \$1,650, a victoria at \$1,600 and a roadster of special design at \$1,400. The power plant consists of a 2 1-2-horsepower, specially wound, electric motor capable of standing excessive overloads for a considerable length of time, 24 cells of battery being employed in every instance, with the exception of the stanhope, which carries 40 cells. This keeps the weight down to an extremely low limit, the roadster tipping the scales at but 1,500 pounds, the victoria being only 50 pounds heavier, while the stanhope weighs 1,900 pounds. Such a ratio of power to weight spells efficiency, which is exemplified in the 100 mile radius of the specially designed roadster.

Electric Vehicle Company's models in all types have long been looked upon as standard designs in this field, and the exhibit made by the company reflects the high position it has occupied in the building of this type of vehicle ever since its inception. Its lines of cars of the heavier types is the most complete shown, including as it does a victoria, brougham and landaulet, beside which there is a private hansom—the only one staged. The vehicles all carry 44 cells of the Exide battery, of which this company is the maker, and are all listed at the same price, namely, \$4,000. It goes without saying that in refinement of mechanical detail, which in the case of the electric vehicle is spelled in terms of mileage per charge more than anything else, as well as in luxury of appointments for the convenience and comfort of the passengers, these cars have been brought to a point where it is difficult for the carriage builder to carry his art any further. The line is completed by a light victoria-phaeton of special design, equipped with 24 cells of battery of a smaller capacity owing to the great difference in weight between this and such types as the brougham. It runs on pneumatic tires, as do all the other models as well, and is listed at \$1,500.

Columbus Buggy Company.—Columbus electric vehicles are illustrative of what a really short step it is from the building of the horse-driven type of carriage to the electric, though on the other hand they likewise show in a striking manner how much the carriage maker's art has been advanced by the advent of the electric. The long experience in the manufacture of carriages enjoyed by these builders before entering the field of electric vehicle building proved the best possible kind of stepping stone for the latter; for, after all, the electric is the closest possible approach to the "horseless" carriage which the maker of gasoline cars found did not represent either a mechanical or aesthetic ideal upon which to build with the form of motive power at his command. Among the cars shown by this firm are a stanhope and coupé, listing at \$1,600 and \$1,900, respectively, and two surreys at \$2,500 and \$3,000. Twenty-four cells of battery are used in every instance, the effective radius being 40-75 miles in the case of the lighter vehicles, and 50-60 miles for the surreys.

Studebaker Automobile Company.—Studebaker is also a name that has long been identified with the building of electric vehicles for pleasure use, the amount of attention of which this branch of the many business interests of this firm is the recipient being well indicated by the great range of electric vehicles shown by it. In fact, the Studebaker exhibit, insofar as the number of styles shown is concerned, may well be put down as the most complete of its kind. In support of this, it may be mentioned that no less than six distinctive types of car are shown, ranging from a small runabout to a heavy surrey. Both this and the standard type of stanhope put out by this firm have a 67-inch wheelbase, with a weight of 1,650 and 1,565 pounds, respectively. Then there is a special stanhope on a 74-inch wheelbase; a coupé on a 68-inch wheelbase, and a special surrey. The runabout lists at \$1,135, the stanhope at \$1,275, victoria-phaeton at \$1,775, coupé at \$2,225, special stanhope at \$1,675, and the surrey at \$2,985.



HOW THE MONSTERS LOOKED WHEN AT REST.



AISLES ARE WIDE AND COMMODIOUS, BUT THEY ARE CONGESTED WITH PEOPLE AFTERNOON AND EVENING.

THE COMMERCIAL VEHICLES OF THE SHOW

By HOWARD GREENE.

DOWN in the basement of the Garden, below the main floor, are the commercial vehicles—those quiet looking workers whose claims upon the attention of visitors do not lie so much in their outward appearance as in their ability to do more and better work than horses—to “deliver the goods” both literally and in the popular parlance. The basement was never a beautiful place, notwithstanding the fine-sounding name of Exhibition Hall that has been bestowed upon it, its brick floors and walls and its bare beams and low ceilings giving little opportunity for decoration. For the present show, however, it has been transformed in a manner that was a decided surprise to visitors, the blue Dutch decorations on the walls having an exceedingly pleasing effect, somehow offsetting the low ceilings and making the brick floor seem quite appropriate. Plenty of light and the excellent arrangement of the exhibits, combined with the decorations, make the lower regions quite tenable, and the comparative quiet is decidedly grateful to business men who want to talk over matters with the truck builders.

Among the commercial vehicles exhibited in the basement there is a variety of types that is a little surprising, in view of the comparatively small total number of cars of this class shown. Honors are about equally divided between electric and gasoline vehicles, there being three exhibitors of each, excluding one exhibitor of motors only. Steam is not represented. So far as the actual number of vehicles shown is concerned, the electrics have much the best of it, there being eleven of these to seven gasoline vehicles. What the latter lack in numbers, however, they make up in interesting features and in variety of types; the electrics show practically no changes from what seems to be well established practice, if exception is made of improvement in the quality of the materials employed and in constructional methods. There is a very general tendency to make bodies as solid and serviceable as those used on horse-drawn trucks—this having reference more especially to the heavier ma-

chines—and to refrain from the very unnecessary and expensive process of putting a high finish on a truck intended for rough work. As a consequence the big machines are mostly of rather sober and businesslike appearance, which is quite in keeping with their character.

Gasoline motors of a number of types are employed to furnish propulsive power for machines, big and little. The types represented are the four-cylinder vertical water-cooled, four-cylinder vertical air-cooled, single-cylinder horizontal water-cooled and double-opposed cylinder horizontal air-cooled. Transmission systems include both planetary and sliding gear change-speed mechanisms—a two-speed planetary gear being found on the heaviest gasoline truck in the show as well as on the lightest gasoline delivery wagon. In final drives are double chains, single chains and, what is something entirely new in American commercial vehicles, a propeller shaft and worm drive. In frames the big trucks, both gasoline and electric, prefer channel or I-beam structural steel, with the exception of one large gasoline truck, which uses a very heavy and deep pressed steel frame. In smaller vehicles angle steel and steel-flitched wood are much used. Three exhibitors, one of gasoline and two of electric machines, fit their vehicles to be controlled from the left hand side, considering this a decided advantage for a commercial machine, especially if it is to be used in dense traffic, where close maneuvering is necessary. Tires are of solid rubber in all cases, even on light machines.

Among the electrics familiar constructional methods are followed, batteries being underslung and motors carried in the rear, and driving through either gears or chains to a countershaft, and thence by chains to the rear wheels. In one instance the motor is carried behind the rear axle. For heavy vehicles two motors are the rule, a single motor being used in light models.

Franklin.—An extremely interesting vehicle is the one-ton gasoline truck shown by the H. H. Franklin Manufacturing



A LINE OF PACKARD DEMONSTRATORS ON FOURTH AVENUE.

Company, of Syracuse, N. Y. This is a platform truck with a four-cylinder air-cooled motor of 12-horsepower placed under the high driver's seat, where it occupies no space that could be used for loading, but still is easily accessible through large metal grill-work doors in front and removable panels at the sides and rear. The motor is exactly the same as that of the Franklin Model D pleasure car, and is stated to be quite as economical in commercial as in pleasure car service. Transmission is through disk clutch and sliding gears, with final drive by propeller shaft and worm gear. This arrangement gives a very high road clearance with a low gear ratio; the gear used is of moderate size and the worm drives from the top. The pitch of the worm is rather steep, so that when the car is coasting the gear can drive the worm. By the use of high strength modern alloy steels the car has been made very light, weighing about 2,000 pounds and carrying the same weight. The Franklin wood framing system is employed.

Knox.—The Knox Automobile Company, of Springfield, Mass., shows two "waterless" delivery wagons with double-opposed cylinder motors under the bodies, cooled by the familiar Knox porcupine system. No important changes have been made in these vehicles since last year, though advantage has been taken of recent developments in the manufacture of alloy steels to obtain additional strength without increasing weight. The most conspicuous Knox exhibit, however, is the new automobile chemical fire engine, which is shown for the first time. This machine has already been described in *THE AUTOMOBILE*, but it may be said that it consists of a standard Knox touring car chassis with 25-30-horsepower vertical four-cylinder air-cooled motor, with two 30-gallon chemical tanks of polished brass mounted on the rear, together with small hand extinguishers, lanterns, axes and the tools and small articles usually found on such machines. The speed of the machine has been found of very great advantage in getting to fires, and the car has proved, in actual service, to be entirely reliable. There is a rubber-covered platform at the rear for two men to stand on. Solid rubber tires are fitted to the artillery wheels.

Pope.—Two electric vehicles are exhibited by the Pope Motor Car Company, of Indianapolis, Ind., manufacturers of the Waverley cars. One is a closed delivery wagon and the other an open vehicle with a box body of the express type. Steel-flitched wood frames are employed. In each of these machines a single motor is used, this being the company's practice in light models, though two motors are used in heavy cars. The motor is suspended centrally in front of the rear axle, and drives through double gear reduction and side chains to the rear wheels. Exide or National batteries are used, suspended under the flooring in the usual way. Steering is by wheel, placed on the left hand side, and the motor-controlling handle is also on the left. Steering

gear is of the rack and pinion type, and the wheel tilts. There are two brakes, one acting on a drum on the countershaft and the other an electric brake.

Studebaker.—The Studebaker Automobile Company, of South Bend, Ind., shows a line of four electric vehicles ranging from a very light delivery wagon to a heavy truck. The small wagon has a single motor driving to a countershaft and thence by chains to the rear wheels, while in all the larger cars there is a double motor system, each motor driving a short separate countershaft and a sprocket on each countershaft driving its rear wheel by chain. The Studebaker machines are controlled from the left hand side, wheel steering being employed in the heavy cars and side lever gear in the lighter models. These cars adhere, in the main, to the lines of last year.

Hewitt.—Three vehicles were shown by the Hewitt Motor Company, of New York, two being single-cylinder delivery wagons with inclosed bodies, arranged to slide backward to uncover the single-cylinder horizontal engine and planetary transmission gear, and one a 5-ton truck chassis. These cars are practically the same as shown last year at the Garden. The big truck, however, has been changed in some important respects. The general construction has been strengthened, and the vehicle, though rated at five tons capacity, is said to be capable of carrying seven or eight tons, the weight being 8,000 pounds. The motor, with four vertical water-cooled cylinders, develops 30-horsepower and drives through two-speed planetary transmission, propeller shaft and bevel gears to a countershaft and thence to the rear wheels by chains. The frame is a remarkably deep section pressed steel, and it looks fully equal to any load that could be placed on it, as do the springs, of the heavy truck type, semi-elliptic. Steering is by wheel on the left hand side, and the control wholly by foot, there being no side levers.

General Electric.—A number of electric motors and controllers of types used in commercial vehicles are shown by the General Electric Company, of Schenectady, N. Y., as well as several mercury arc rectifiers for converting alternating to direct current for charging storage batteries; the rectifiers were shown in operation, their weird bluish light attracting considerable attention. The motors, of various sizes, were of a kind used as standard equipment by a number of manufacturers of electric commercial vehicles, and, like most of the electrical equipment seen in the basement of the Garden, show little or no variation from lines followed for some time past.

General Vehicle.—In the vehicles of the General Vehicle Company, of Long Island City, it is notable that the pedestals heretofore used have been replaced by the more ordinary spring and shackle arrangement. These pedestals were made on the same principle as the blocks that guide the axles of a railroad car or engine in its vertical movements, and were characteristic General Vehicle marks. The manufacturers consider the more usual construction the best, and have therefore swung over to the majority.

A REVERSE CONTROL THAT IS INGENIOUS.

Along lines that find much favor is the exceedingly ingenious arrangement of the reverse control on the new Hotchkiss selective gear system. Only two longitudinal slots are provided in the quadrant, there being no special slot for the reverse. By the usual forward and backward movement of the lever in the two slots, the four forward speeds are secured, while the reverse is obtained immediately behind the low-speed position, in the same slot. On either side of the slot at this point are raised edges, against which a latch normally abuts, so that the low speed cannot be overrun. By raising the latch, however, a further rearward movement of the lever is permitted, whereupon it locks in the reverse.

HEWITT UNCOVERS AN EIGHT-CYLINDER CREATION

It was not until the complete list of makers who would exhibit at the Garden was made public that it became known that, while there would be no further additions to the advocates of the six-cylinder type of motor, there would be at least one representative of the eight-cylinder. This is the Hewitt 50-60-horsepower touring car, and, to judge from its external appearance with the bonnet down, it would never be thought to cover a motor having eight cylinders, as it is, in reality, inches shorter than a number of those on cars equipped with the standard type of four-cylinder motor. So far as the general design of the motor is concerned, Mr. Hewitt does not claim to have evolved anything startlingly new or radical, having taken the best standards of foreign practise as a guide.

Thus the cylinder castings are separate with the valves on one side, the motor as a whole practically consisting of two four-cylinder units placed at 90 degrees to one another on a crankcase of special design. This arrangement of the cylinders and valves permits of the use of a single camshaft which is centered between the two motors inside the crankcase. At its forward end, as shown by the accompanying front view of the engine, it revolves an upright shaft through bevel gearing. This shaft carries a combined timer and distributor at its upper end, and it in turn drives a series of small gear pumps of special design which are combined in the single multiple unit shown in a horizontal position close to the base of the standard surrounding the timer shaft. There are fourteen of these pumps, and each one feeds to

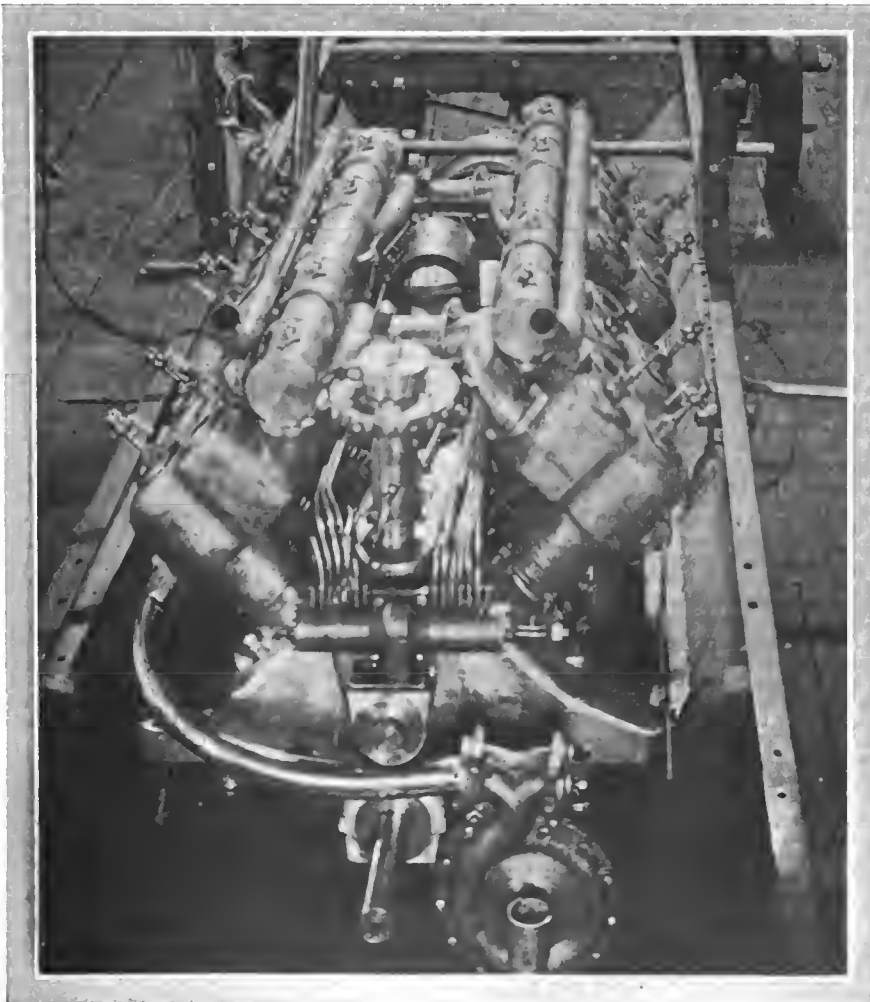
a lead supplying one of the principal bearings of the motor, giving nine drops per revolution to each. From the other end of the gear driving the oil pumps the shaft is continued rearward and employed to operate the magneto which is centered on the crankcase midway between the cylinders, a universal joint being used on this driving shaft to compensate for any relative movement. The magneto is a Simms-Bosch of the Renault high-tension type, and its position renders a minimum of wiring necessary. The order of firing is the same as that of two four-cylinder motors, the second of which explodes in inverse order to the first. For instance, the cylinders on the right hand are numbered 1, 3, 5, 7, and the left hand four 2, 4, 6, 8, which makes the order of firing 1, 8, then 5, 4,

and so on. The camshaft and its eight cams are integral.

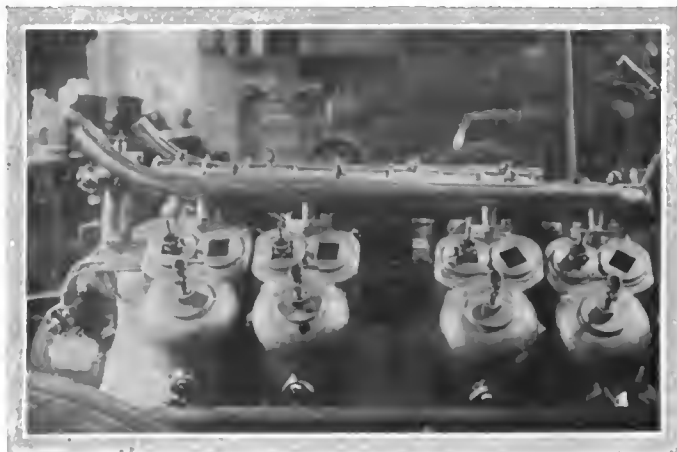
The cylinder dimensions are 4-inch bore by 4 1-2-inch stroke, the motor developing its rated output of 50-60 horsepower at a comparatively low speed. The valves are 2 1-4 inches in diameter, giving a 2-inch clear outlet, and are covered with bronze valve caps, as are also the openings in the water jackets in the heads of the cylinders. The carbureter, which is of special design, is located between the right-hand units, considerable space having been left between the front and rear pairs on each side, the inlet manifold running down the center of the motor above the magneto. The flywheel is a basin-shaped, hollow casting about 16 inches in diameter, to which a spun steel cap carrying steel fan blades riveted to it is fastened. Complete, this flywheel only weighs about fifty pounds, and is made in this form to dispense with the necessity of a fan behind the radiator. An idea of the liberal dimensions given every part of the motor may be gained from the fact that the crankpins are 17-8 by 23-4 inches, though the motor complete only tips the scales at 590 pounds. Cooling is by means of a honeycomb radiator and centrifugal pump driven directly from the crankshaft.

The two-speed planetary gear which constitutes the transmission is also designed on the same generous lines, its weight of approximately 100 pounds making up for the lack of avoirdupois in the flywheel, though the power impulses are so close together in an engine with this number of cylinders that there is no necessity for great weight there. As will be plain from the

photograph illustrating it, this change-speed gear is carried longitudinally on the same sub-frame that supports the motor, final drive being by propeller shaft to a live rear axle. The steel constricting bands giving the low and reverse speeds bear against a series of fiber blocks slightly wider than the bands themselves and let into the periphery of the gear-containing case. The disk on the high-speed or direct drive bears against six helical springs let into the face of the gear box for a distance of about two inches, so that the motor is enabled to pick up the load very gradually regardless of the manner in which the clutch is engaged. An oil feed from the pump on the motor is carried back to lubricate the transmission. Control is by means of a system of interlocking pedals which may be locked in place



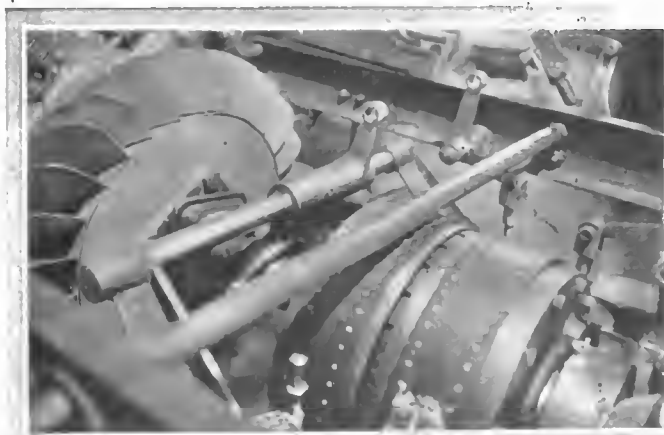
FRONT VIEW OF MOTOR SHOWING IGNITION, LUBRICATION AND PIPING DETAILS.



SIDE VIEW HEWITT SHOWING CYLINDER PLACING.

or released merely by the angle at which they are pushed, and which do not permit of the engagement of one gear without the release of the other, this being accomplished automatically. That is, when the car is running at any particular speed is not necessary to release the pedal corresponding to it before engaging another; merely depressing the latter throws the other pedals out of engagement before the new one can come into action. This makes a very effective form of control.

Light sheet steel is riveted between the main and the sub-frame throughout the entire length of the latter and the remainder of the mechanism is thoroughly protected by a steel pan which is readily removable. The differential is of the three-pinion bevel type, using nickel steel gears, this material also being employed in the crankshaft, valves, and other parts of the motor. The live axle is 1 3/4 inches in diameter and is supported on two 7-inch bearings. The wheels also run on very large bearings of the plain type, it being intended to replace these later with Timken roller bearings of large size. The differential case and rear supporting axle are stayed by a heavy strut and turnbuckle. The frame is of the usual channel section, pressed steel, heavily reinforced and stayed by cross braces. Brakes are fitted in drums on the rivers and are of the double internal expanding type. The wheelbase is 110 inches and 875 by 105 and 880 by 120 tires will be fitted front and rear, the car in complete running order tipping the scales between 2,900 and 3,000 pounds. Fitted with a standard type of touring body, the car lists at \$5,500. Whether considered merely from the motor point of view or as an entity, the car is an unusually creditable production and should prove about as silent and smooth a running machine as it is possible to build. It was rushed to completion for the show and further refinement of design will undoubtedly be made later.



HEWITT FLYWHEEL AND TWO-SPEED PLANETARY GEAR.

LIGHTING THE ROAD AHEAD.

Badger Brass Manufacturing Company.—The makers of the lamps "that show the way," have a stand full of the Solar acetylene headlights for the delectation of the autoist, who makes a round of the accessory makers' stand, to get pointers on the equipment of his car for the coming season. Correct design along lines calculated to produce the highest degree of efficiency coupled with satisfactory service, together with the long standing of these lamps on the American market, places them in the foremost rank.

R. E. Dietz Company.—As makers of lamps years before the automobile became a factor, at first the auto lamp business of this concern was but a small side line, but the demand for their special types has been so great that it has now developed to a point where it forms a very important part of their total output, as may be judged from the elaborate array of styles shown on their stand. All their lamps are built on the Sterling cold-blast principle, their limousine square models, for 1907, being particularly attractive.

Edmunds & Jones Manufacturing Company.—"E & J" lamps are the product of this firm, and their long standing in the automobile world is well reflected by the assortment of up-to-date styles they display. They have made a specialty of acetylene headlights, along original lines and their output has become so extensive within the past year or two, that the E & J lamps are known the country over.

Gray & Davis.—"We have always set the style," say Gray & Davis, in introducing their new model square carriage lamp type, for the season of 1907, which forms a prominent part of their exhibit. They have been vehicle lamp builders for a number of years back, so that it is easy for them to show how history has repeated itself in the evolution of the G. & D. lamp. In 1898, the two-light square carriage lamp of the candle type, was the vogue and remained so for some time. Then the automobile appeared on the scene, and for it something on the lines of the Continental locomotive headlight, which later grew into the "Bullet" type and then disappeared in favor of the square style now so much in demand.

C. T. Ham Manufacturing Company.—"Ham's famous cold blast lamps" is the slogan of this concern, and it is well reflected by the generous showing of various styles and types for different purposes that is spread out for the benefit of the visitor. Some of these to which attention is called, are the "Corona," the "Tourist," the "Apex," and "Monitor," all of them being adapted to burn kerosene oil, and are guaranteed to be of the type that neither jars out nor falls to pieces under any provocation.

Rushmore Dynamo Works.—Though its name was slightly misleading at first, this firm has become so well-known to the trade and the autoist generally, that its equivalent in the shape of acetylene searchlights and generators needs no introduction. The special system on which both the headlights themselves and the generators of acetylene gas are constructed, together with a painstaking effort to give the buyer the very best value that can be produced at any price, makes a Rushmore an investment that pays well in the end, though the initial outlay may be greater.

Rose Manufacturing Company.—"Neverout" lamps date back to the heyday of the bicycle, and thousands of them still adorn bicycles at this day, though the number of automobile headlights which have been produced in the interim, outshines them many to one. They are shown together with the well-known "Neverout" patent invertible safety gas producer.

Manhattan Lamp Company.—The chief model placed on display by this firm at its stand is their new flare front, all brass searchlight, which has just been placed on the market. They are made in sizes ranging from six to nine inches, equipped with both the stationary and swinging bracket supports. Other styles shown are French models, and the extensive line of marine lamps for which this house has long been famous, all of which are put out under the well-known "Saxon" trademark.



ONE CORNER OF THE GARDEN TIREVILLE.



ANOTHER SECTION OF ACCESSORIES GALORE.

WHAT THE TIRE MAKERS HAVE TO OFFER

TO the casual spectator the numerous exhibits of tires present much the same appearance year by year, and even those more deeply interested see on the surface but little that is new. The exhibits include, as a rule, a number of tires of the different standard patterns, several mounted wheels displaying the tires in place, and sections of tires showing the construction. So far as form and general method of tire construction are concerned, there is little change from year to year, but it must not be inferred that the tire makers are idle. The more stringent requirements of car users, due to increased weight and speed and more general use over roads of all kinds, keep the tire men busy in and out of season. Except in certain details, the result of this work is not visible at the show; it can only be appreciated by the user on the road.

The complete tire exhibit of 1907 includes first the pneumatic tire for touring and racing, then its humbler companion, the solid tire for commercial work. An auxiliary feature which is each year assuming greater importance is the "detachable rim," so called, which may as well be divided now into the two classes which it naturally forms; first, what may be called the "dismountable" type, in which the rim is taken apart to admit of the removal of the tire; second, the "detachable" type, in which the entire rim is separable from the felloe, or from an inner rim, being removed with the tire in place and immediately replaced by a spare rim with tire inflated on it. This new type, first heard of a year ago in the Continental races and seen here this year in the Vanderbilt Cup race, is rapidly coming to the front, many inventors being busy with it. Several examples are seen at the show, with others of the dismountable type.

Ajax-Grieb Rubber Company.—Quick change tire devices are receiving much attention from the inventor. It is generally admitted that for touring purposes the best device is one allowing the outer flange to be removed, to give an easy change of inner tube; for racing a dismountable rim, allowing an inflated tire fully mounted on its rim to be substituted for a burst one, is essential. Both cases are provided for by the models just brought out by the Ajax-Grieb Rubber Company. The dismountable outer flange is held in position on the rim by a spring band 1-2 inch deep and 1-4 inch wide, slotting into a groove on the fixed and movable rim. To dismount, it is only necessary to remove a small safety wedge, fitting up the opening between the two

ends of the spring band, contract this latter by means of a small lever and knock off the rim. The racing model is based on the same principle. The road wheel carries a fixed metal-faced rim with its inner edge raised. A movable steel rim, on which had been previously mounted a complete tire, is slipped over this and locked against side movement by an expanding band, like the one just described. To prevent creeping, the fixed rim has three grooves, into which lodge projections on the movable rim. Bearing, however, is distributed evenly over the entire rim. With this type special countersunk security bolts are employed. Under ordinary road conditions a tire can be changed in less than thirty seconds. The manufacture of a tire is also shown at the Ajax stand, the process being complete, except for the vulcanizing.

Continental Caoutchouc Company.—The regular Continental line is supplemented by a new non-skid tire for both racing and touring, built up in such a manner as to hold the studs firmly within the body of the tire. A new pattern of corrugated tire with flat tread is shown, and also the heavy tires, 5 1-2 inch, of which the company makes a specialty for use on cars of exceptional weight.

Diamond Rubber Company.—The growing prevalence of the dismountable rim has made evident the need for a special tire for such a construction, and this has been met by the new Diamond "quick-detachable" tire, of the flat-tread pattern and made with a very hard bead. Though specially made for the Marsh rim, this tire is guaranteed when used on three other special rims. There being no staybolts, a flap is built into the casing to prevent the bead rising under a side strain. The Marsh rim is shown, as fully described in THE AUTOMOBILE, also the Diamond inner tubes made without grain in the rubber. The other Diamond lines, including the wire mesh base and the side-wire type are shown.

Firestone Tire and Rubber Company.—The new safety universal rim is shown with changeable rings to fit contour of tire for all standard makes; the locking device of the split ring being simple and strong. The pneumatic tire of 1906 has been improved by the omission of the brass clips and the addition of a spreader which is controlled at the valve stem. A new standard clincher tire has been added since last year. The regular patterns of Firestone solid tires are shown.

G & J Tire Company.—The special section known as the

oval raised tread put out in 1906, with the tread oval instead of flat, giving an improved surface of contact, has proved successful in strength, durability, and efficiency and is continued as the standard line for 1907, both in the G & J and the Indianapolis Dunlop types. Specimens of the tires are shown, with the regular Midgley universal rim. The G & J motorcycle tires are also shown.

B. F. Goodrich Company.—The company's quick demountable rim, in universal sizes, is shown; the removable ring carrying a hook on each of its ends which engages in a slot in the flat rim. Without resort to lugs, clips, turnbuckles, screws and bolts, the tire is securely locked and all possibility of creeping averted. The clincher tires are also shown and the two styles of tread, the flat and the Bailey "Won't Slip." The Goodrich-Bailey is planned and made with a view to the solid anchoring of the studs so that they are held firmly with no tendency to work loose under the heaviest strains of hard roads and big loads. The Goodrich endless side wire solid tires for commercial vehicles are also shown.



ON THE RAISED PLATFORM, KNOX IN THE FOREGROUND.

Goodyear Tire and Rubber Company.—The regular lines of tires are shown, with little change from the high standards of the last few years. The demountable rim has been improved by a change in the locking ring, which is hollow and non-reversible; rings are provided for the Goodyear and the standard clincher tires. A novelty is the heavy tourist traction tire, just introduced, with a special arrangement of transverse grooves, spaced about three inches apart. This tire is built for hard work and wear, with a tread of half an inch of rubber, and the corrugations give increased traction in sand and mud. For a non-skid tire two circumferential grooves of square section intersect the transverse grooves.

Harburg Tire Company.—This American company handles the tires of the Harburg and Vienna India Rubber Company, of Harburg, Germany. The exhibit includes the usual line of clincher tires for touring and racing. The Harburg rim is of the detachable type; the steel rim holding the tire permanently and being itself removable from the main body of the wheel. In this way a pair of spare rims with tires not only in place but fully inflated and ready for use may be conveniently carried. In the event of a puncture the rim in

use may be removed by removing four nuts and slacking two others, when the rim may be slipped from its bed on the felloe. The extra rim and tire are slipped in place, the beveled faces of the felloe and rim assisting this operation, and the six nuts set up, completing the operation.

Hartford Rubber Works Company.—The regular Hartford line is shown in its full variety, of course including all the most recent features of tire and rim artificing. The demountable rim has been improved by the addition of a small but important detail, a worm gearing in connection with the central boss of the right-and-left screw of the turnbuckle, making the adjustment easy and rapid and also self-locking, as the worm gear cannot reverse. The demountable rim is shown in connection with the Midgley all-metal wheel. An important departure is the new Midgley wire grip tread, a non-skidding device. Five separate strands, each a helical spring about 3-16 inch in diameter, of hard steel wire, are firmly bedded in the tread of the tire, completely encircling it. As the outer surface of each coil or spring wears off, it leaves a series of small steel staples projecting from the rubber and gripping the road surface. There is nothing to throw mud or to cut the road, and no mass of metal to heat and destroy the rubber, but only the large number of small parts, each doing its work. The universal feature of the demountable rim is now perfected, the rings being reversible to fit different patterns of tires.

E. Lamberjack & Co., Inc.—The famous French tire is shown in all of its many makes by the company which has taken over the entire Michelin agencies of this country. The Michelin non-skid and the corrugated flat tread are the two makes particularly put forward, the excellent satisfaction given by both being considered a sufficient recommend.

Morgan & Wright.—This exhibit includes the usual line of automobile types of the clincher and Dunlop types with various treads, the De Luxe tires, and, as a new addition, a line of solid wire-strengthened tires for commercial vehicles, of various patterns and sizes, single and double.

Pennsylvania Rubber Company.—In tires proper the regular Pennsylvania lines are shown with no material change from last year, but two important additions have been made in a non-skid tire and a detachable rim. The new tire is of the Samson type but with special details of construction by which the studs are bedded in the center of the rubber, the outside leather merely steadying the outer ends of the studs. The detachable rim is composed of two steel hoops, one carried permanently on the spokes or the felloe and the other slipping over it. The inner rim is made with several slots or indentations in its circumference and studs projecting from the inner face of the removable rim fit these slots. When the rim is pushed into place the studs enter the slots and the outer rim is moved about an inch around the inner rim, thus locking the studs in their respective slots. The inner and outer rims are now locked against turning by two bolts through the felloe and inner rim, after which the outer rim and tire remain a part of the wheel.

Swinhart Clincher Tire and Rubber Company.—A well-arranged exhibit shows the various forms of solid tire with wire backing, including a mammoth 7-inch tire of the twin type on its rim. Two tires which have been in service for two years under a light delivery wagon are shown. A testing machine is used to illustrate the small difference between the Swinehart solid and the ordinary pneumatic tires; a hand lever is so arranged that the pressure of the hand on a small part of the tire surface is equivalent to the pressure on the tire in actual service.

New York Sporting Goods Company.—A new form of spring wheel, just patented by W. E. Schneider, is shown. It has oblong blocks of rubber, being arranged on end diagonally between the inner and outer rims; the device is not yet ready for the market.

Aster Company.—The "Pneu Electric" tires are shown at this stand with the other imported goods for which the company is agent.

Electric Rubber Manufacturing Company.—The Panther tire is shown, a wrapped tread tire, the company giving good reasons for adhering to this method of manufacture. There are also the Panther corrugated flat tread tire and the Panther and M. T. inner tubes. For heavy vehicles there is the Dewes solid endless tire.

International Rubber Company.—The new universal demountable rim now shown is simple and strong and does away with all bolts, screws and similar fastenings; the special clamping rings being readily slipped into place and in turn removed with a screwdriver or similar tool. Both the Bailey tread tires and the wrapped tread are made by a process of curing at one single operation, with a great improvement in quality. The various patterns of the standard clincher and other tires are shown.

this exhibit includes a new demountable rim; the main rim and outer locking rim being held together by a split spring rim of U-section grasping the inner flanges of both.

Samson Leather Tire Company.—The usual variety of this noted non-skid shoe is shown, of a special leather armed with steel studs.

Consolidated Rubber Company.—The Kelly-Springfield solid tire is shown in various sizes; this well-known tire long since reached a point where it might be considered standard.

Dow Tire Company.—A demonstration apparatus is shown. A wheel with pneumatic tire running under pressure on a flat steel pulley; the wheel is punctured by wire nails, but holds its shape with no sign of deflation.

Fisk Rubber Company.—A new feature is the detachable rim; the fixed inner wire is made with a flange on the inner edge while the outer edge is beveled. A split ring of spring steel is beveled to fit the inner rim, being held in place by six



Leather Tire Goods Company.—The Woodworth detachable tread is a non-skid shoe of chrome-leather and canvas, strongly built, with steel studs passing through their broad, flat heads in contact with the tread of the tire. Hooks of sheet metal are riveted to the edges of the shoe and these engage a ring of steel wire on each side. These wire rings are not truly circular, but crimped, and, being of tempered wire, they act as powerful springs to draw the shoe over the tire. The shoe is put in place by deflating the tire, when the hooks may be slipped over the spring rings. When the tire is again inflated the shoe is fast. The shoe need not be removed in order to change tubes. The device is built to prevent puncturing, to lessen the wear and to prevent skidding. A still newer form of tire armor of the anti-skid type is formed of a series of leather straps, each studded with steel rivets and placed across the tire about four inches apart.

Republic Rubber Tire and Shoe Company.—The Hercules leather non-skid tires and tire protectors are shown.

Republic Rubber Company.—In addition to clincher tires

set screws. The outer rim with its tire is readily slipped on over the split ring, which is then expanded as the set screws are set up, wedging it out until the inner and outer rims are firmly locked together. Fisk tires are also shown.

Motz Clincher Tire and Rubber Company.—The Motz solid tire is intended for pleasure cars, to replace the pneumatic; a new pattern is shown, with the sides undercut to give increased resiliency and the tread divided by a deep circumferential depression. Special advantages are claimed on sandy roads and also against skidding.

R. & P. Traction Tread Tire and Tube Company.—The traction tread tire is designed with a broad, flat face and inclined edges, the face being corrugated circumferentially. It is claimed that a greater protection from puncture is obtained with no liability to skid. The R. & P. duplex emergency tube is a combination of double inner tube and valve, the innermost tube of all being used an ordinary puncture.

Trident Tire Company.—The Trident tire is shown in the ordinary round pattern and also the flat tread pattern.



THE POPE LINE INCLUDES TOLEDOS FROM TOLEDO, HARTFORDS FROM HARTFORD, AND TRIBUNES FROM HAGERSTOWN.

IN THE EXTENSIVE REALM OF IGNITION

MAKERS of ignition specialties are responsible for what appears to be such a bewildering array of devices, often put forth under varying titles, that the average autoist is prone to look upon this more as a realm of mystery than otherwise. But when things are condensed, it will be found that, as a whole, the subject may be divided into a comparatively small number of heads, though the subdivisions under each are apt to be numerous owing to the number of makers who specialize in different branches. For instance, to start at the bottom, there may first be considered that greatest of all essentials, the source of current supply. Batteries, dynamos and magnetos sum this up, though it is necessary to specify dry and storage batteries, varying types of direct-current dynamos with special systems of ignition, and low and high-tension magnetos, which are also of varying types, according to their makers, in order to cover the subject more fully. Then there are coils, and here, in a single word, a wide range of apparatus is included, for as is the case with many other things, there are coils and coils. Timers and distributors form a division that is equaled by few others for variety and novelty, and it is something in addition in which great advances have been made. Then there are special ignition devices that partake of so many different characteristics as not to be capable of classification under any one head. Last but far from least there are the spark plugs and cable for connections. How much of the increased reliability of the modern automobile is due to the efforts of the maker of ignition specialties can only be realized, and that not wholly, by looking back a few years and recalling what ignition accessories were then and see what they are now.

DYNAMOS AND MAGNETOS.

Dayton Electrical Mfg. Co.—This company show their famous Apple dynamo and complete ignition outfit. This includes a storage battery, automatic cut-out switch for charging the same, and a combined switch and volt-ammeter. They also display a complete line of other ignition sundries, such as coils, plugs, etc.

Motsinger Auto Device Mfg. Co.—The well-known "Auto-Sparker," which is a small direct-current dynamo with a special governor attachment, is manufactured and shown by this firm. This has been on the market for a number of years and has given excellent satisfaction for marine and stationary work.

Remy Electric Co.—This firm shows its full line of magnetos for both low and high tension service. They also display a line of magnetos with oscillating armature for use on large stationary engines. Both the high and low tension magnetos are the standard equipment of several well-known touring cars.

Pittsfield Spark Coil Co.—In addition to a full line of coils, commutators and spark plugs, this firm shows a new line of high tension magnetos which they have just put on the market. All the working parts are completely inclosed, and the machine looks very durable and substantial.

Albert Champion Company.—Among the complete line of accessories and automobile parts handled by the Albert Champion Company, the Gianoli high-tension magneto occupies an important position. Simplicity and the essential quality of durability are combined in the Gianoli. It starts readily and after reaching 500 revolutions per minute maintains a constant tension, no matter how great the speed, thus doing away with any chance of burning out secondary or puncturing condenser. "Electric" automobile tires, comprising round and flat pneumatic types, anti-skids and solids, manufactured by one of the most important French firms, are another important line. Champion spark coils, Nieuport spark plugs, insulated cable, etc., are a few more of the many features.

C. F. Splittdorf.—This well-known maker shows his usual line of coils and other ignition sundries. In addition to these this year he is showing a line of high tension magnetos, including a small one for motorcycles. In this line is included a complete double system, including coil and switch.

Holley Bros. Co.—In addition to a full line of carbureters, including many special types, this firm shows the Holley magneto, including a double coil for an alternative battery system. The Holley magneto is on original electrical lines, which it is claimed make it much more efficient at low speeds than the ordinary magneto.

Leon Rubay.—This exhibit fairly swarms with novelties. All of the Lacoste goods are shown, including coils and timers. The special features are a full line of the Lacoste magnetos in operation and a small gasoline generating set for lighting country houses. This plant is shown complete, including switchboard and storage batteries.

Lavallette & Co.—This firm is the sole agent for the Eisemann magneto and shows a full line of the various types of machines, most of which are displayed in operation. There is also shown, in connection with this exhibit, about every possible combination of double ignition, both with one and two sets of plugs.

Robert Bosch, N. Y., Inc.—The well-known Simms-Bosch magnetos for every service, from the high-tension machine for motorcycles to the large low-tension oscillating types for stationary units of high powers, are displayed by this firm. All of these are shown in connection with models adapted to be operated by hand, and the exhibit is remarkably interesting to a student of the subject.

Sibley & Pitman—Show a very complete line of ignition sundries of various manufactures.

AMONG THE BATTERY PEOPLE.

American Electric Novelty Co.—This company show the "Ever Ready" dry battery and other "Ever Ready" electrical goods, such as gauge and speedometer light, etc., which are too well known to require description. It has brought out a combined clock, speedometer and odometer, very compact and known as the tourometer.

Eastern Carbon Works.—This firm displays its full line of standard dry cells and, in addition thereto, their new gas engine cell, which is especially designed for ignition purposes. The company is also showing a volt-ammeter which they warrant thoroughly.

Electric Storage Battery Co.—A complete line of vehicle batteries and ignition storage batteries is exhibited by this concern, their line being too well known to need description.

Franco-American Supply Co.—This concern displays the Look storage battery and also an extensive line of auto supplies, such as indicating bell pumps, Amco tire holders and the famous "One Minute" tire remover, which is demonstrated in a very satisfactory manner on the stand.

Gould Storage Battery Co.—These makers show a full line of their vehicle and ignition batteries. They are specially designed for the purpose for which they are to be used, and have been on the market for several years past, during which they have met with continued success.

Kitsee Storage Battery Co.—A full line of their sparking batteries are on view. For this type of cell special claims of lightness, large capacity and durability, as regards its efficiency, are made. Its neat carrying handle is a minor but noticeable feature.

National Battery Co.—A complete display of both vehicle and sparking batteries is shown by this concern. Their specialty is, of course, batteries for vehicle work, but their ignition batteries are well and favorably known.

National Carbon Co.—This firm makes the famous Columbia dry cell. Their line includes their standard dry cells and the special reserve dry cell. A special feature of this exhibit is the "Big No. 6" dry cell, which measures ten by twenty inches.

National Sales Corp.—In addition to a full line of sundries, the Royal battery, which had a number of interesting features, among which were a shock absorbing base, unspillable vent, non-corrodable binding post and automatic carrying handle, is shown by this firm. Their other lines comprise the Gaither-Owen carbureters and the Connecticut Telephone and Electric Co.'s coils and instruments, including the new gasoline dash gauge, introduced by the latter makers.

Semi Dry Battery Co.—The chief feature of this exhibit is the Jackson test board, which is designed to test ignition batteries comparatively under as nearly as possible actual working conditions. It is shown in connection with their special type of semi-dry cells.

Stackpole Battery Co.—This is a comparatively new concern, making its first bow to the public at a show this year. They specialize on five types of cells, each designed for a certain class of work, such as telephone, ignition and bell work, claiming that for each service a specially designed cell is necessary to obtain the most satisfactory results.

Vesta Accumulator Co.—This concern makes the Vesta accumulator, for which general all-around excellence is claimed. They also market an electric horn, which certainly speaks for itself, and also a very neat trouble-hunting lamp, which may be attached to the ignition batteries.

Witherbee Igniter Co.—The batteries "with the bee" are too well known to need any introduction. The complete range of regular types, which have undergone very little change since last year, is shown. A shock absorbing base of soft rubber has been secured to the bottom and this is said to add greatly to the life and efficiency of the battery.

COILS, TIMERS, DISTRIBUTERS, PLUGS, ETC.

Aster Co.—This firm exhibits a special French ignition wire made especially for high-tension work by the Société Industrielle des Telephones, of Paris. It is also agent for the Pneu l'Electric tire made by the same firm.

Atwater Kent Mfg. Co.—This firm shows its spark generator, which has been adopted as part of the standard equipment of a prominent touring car for this season. They also show a full line of their switches and meters. This season they have brought out a low-reading ammeter specially adapted for coil testing.

Autocoil Co.—This concern shows a line of coils of the interchangeable unit type. A specialty made by them takes



THOMAS SHOWS "FORTYS" AND "FLYERS."

the form of a coil box with an extra unit for emergency use. They also show a switch on the coil box to be used for changing over from battery to magneto, which is specially designed to be operated by the toe of the driver. Their four-unit coil, combined with a testing ammeter in the face of the case, is a recent specialty.

Other coil manufacturers are the Conn. Tel. & El. Co., the Byrne Kingston Co., the Pittsfield Spark Coil Co., and C. F. Splitdorf. These have been mentioned above.

T. Alton Bemus, Inc.—A specially designed distributor and timer, which is of the double-ball contact type, is shown by this manufacturer. As the only wearing parts on the contacts are the ordinary bearing balls, replacements can, if necessary, be easily and cheaply made.

E. M. Benford.—This maker shows a very complete line of mica plugs. A specialty is the racer plug, which is fitted in a tapered hole in the bushing, for which the mica insulator is a ground fit. This plug is fully warranted.

J. S. Bretz Co.—This firm shows the F. & S. annular ball bearings, of which they are the sole importers. This bearing is of the annular non-adjustable type and is provided with a separator and has special facilities for the removal and replacement of broken balls.

Byrne Kingston Co.—A full line of carbureters and mufflers for automobile and marine motors, of both the two and four-cycle type, is on display by these makers. In addition to this line, they also show a full line of coils which are designed on the latest and most approved lines.

Connecticut Telephone & Electric Co.—These makers have a complete line of coils and ignition sundries on exhibition, including a rather novel distributor and timer. One new wrinkle on its coil is the use of an adjusting screw with a graduated head. A novelty shown by this firm is a dashboard gasoline gauge, which is remarkably simple and effective in operation.

Duplex Ignition Co.—This firm shows the Duplex plug, the feature of which is the use of a small condenser contained in the porcelain of the plug and which will cause the spark to pass between the points, no matter how badly they may be fouled.

Heinze Coil Co.—These manufacturers show a complete line of coils, both for battery and magneto ignition. An interesting portion of this exhibit was a 24-inch spark coil in operation.

Herz & Co.—This firm shows a full line of its ignition specialties. It also shows the Paternoster shock absorber, for which it is the agent.

Igniter Appliance Co.—This concern shows the "Shur Fire" spark plug in actual operation, both with a magneto and battery, as a source of current supply.

Geo. Loring Co.—This firm shows the W. E. B. spark plug, for which it is the selling agent.

A. R. Mosler Co.—This firm shows a large line of special timers and distributors of its own manufacture. A novelty which it has just brought out is a combined porcelain terminal and plug protector.

Snutel Ignition Co.—A line of ignition apparatus of French manufacture, a rather interesting feature of which exhibit is a motorcycle coil that can almost be carried in the vest pocket, is displayed by this firm.

Uncas Specialty Co.—A very complete line of timers and distributors is displayed by these specialists. Two of their Leavitt distributors are shown constantly running, one in oil and the other in water. A specialty brought out this year is a roller type timer which has a special ground connection for high-speed work.

Wray Pump and Register Co.—The Lindsay timer and distributor is exhibited by this firm. This is remarkably compact, and a special point of novelty about it lies in the fact that it is protected with a heavy transparent glass cover.

LUBRICATION IS VITAL AND SHOULD BE THOROUGH

A. W. Harris Oil Co.—The various grades of special lubricants manufactured by this firm, such as the Excello gas engine cylinder, light-bodied cold test oil, A. W. H. gas engine cylinder, medium bodied; super gas engine cylinder, heavy-bodied; special super gas engine cylinder, extra heavy-bodied, and S. H. steam cylinder oil, each of which is shown feeding upward through glass tubes in order to illustrate the uniformity of its flow, and is also shown dripping on and flowing over a metal surface to enable those interested to examine the characteristics of the various grades. Beside these, there is exhibited trans compound, which is a fluid oil reduced to the consistency of grease for gear box lubrication.

John T. Stanley.—Special cleaning compounds put out under the trade names of "Mobo" and "Shofa" are the subjects of the exhibit of this manufacturer. "Mobo" is for the car and "Shofa" is to enable its driver to perform the same services for himself when grease and grime have become ground into his hands and ordinary soap and water are not effective.

N. Y. & N. J. Lubricant Company.—This firm makes a specialty of non-fluid lubricating compounds which are particularly valuable for winter lubrication when ordinary oils tend to get hard and stiff, though these non-fluid oils retain their consistency under any temperature conditions met with throughout the year. They are warranted not to drip, waste, clog or gum.

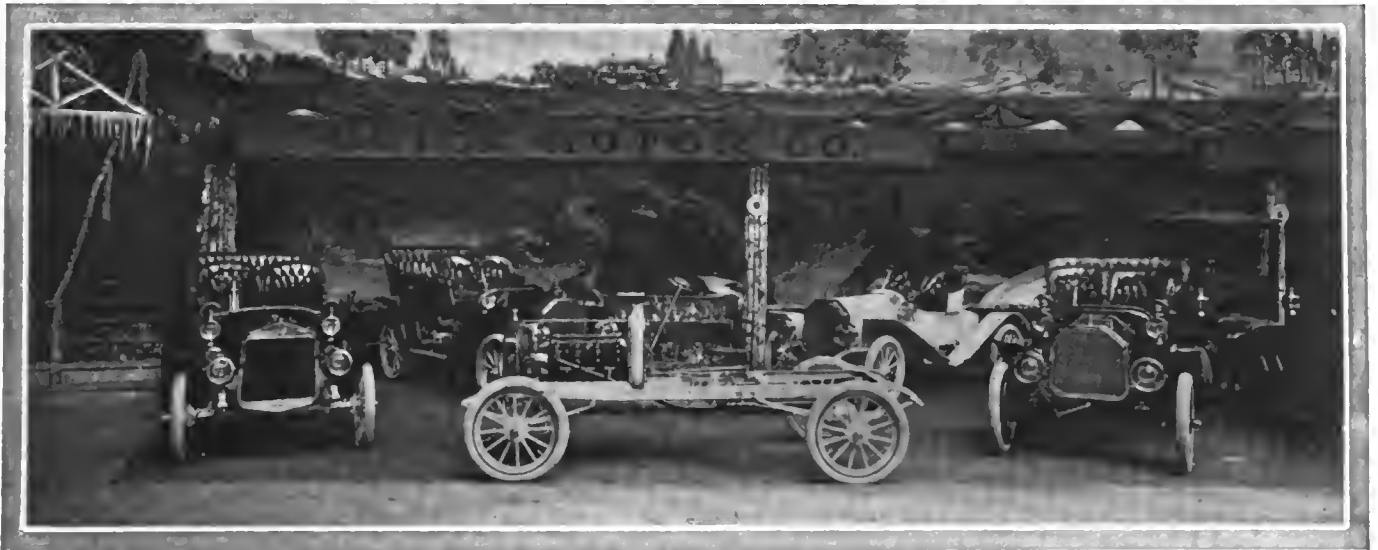
Havemeyer Oil Co.—Lubricating oils of varying flash points and fire tests especially compounded for automobile use are shown by this concern under the trademark of "Havoline," a name that is familiar to the average auto user owing to the success of these oils in continuous service.

Joseph Dixon Crucible Co.—Dixon and graphite have been synonymous terms for so long that the visitor knows what to expect when he sees the name of this firm's booth from a distance. The exhibit consists of the various grades of special graphite lubricants especially compounded for automobile work. In addition the type of brazing crucibles, now largely used by auto manufacturers, and Dixon's silica-graphite paint for metal are shown.

Adam Cook's Sons.—"Albany" grease, which is known the world over wherever machinery is used, is shown by this concern, who have been making this universally known lubricant for almost forty years. In connection with their exhibit they are distributing an interesting little pamphlet entitled "Auto Lubrication," containing considerable information of value to everyone who owns or runs a car.

Vacuum Oil Company.—There is probably no other firm in the business of manufacturing auto lubricants that has given as much attention to the subject of providing a special oil for each car on the market. The Vacuum Mobiloils, made in four grades, are each designed for a special purpose, and the company publishes an alphabetical list of American cars, giving the grade of oil recommended for use with it.

W. C. Robinson & Son Company.—This firm exhibits a full line of lubricating oils for every type of automobile and motorboat engine, as well as for general machine lubrication. They are put out under the trademark of "Autoline" oils, and are shown in a variety of grades and fire tests, each of which is compounded for a special service. A series of tests have been made of practically every machine on the market, so that the firm is in a position to recommend an oil for the user's car in every instance.



ONE OF THE MOST COMPLETE AND ARTISTIC EXHIBITS IN THE GARDEN SHOW IS THE BUICK DISPLAY.

TELLING HOW FAST AND HOW FAR

JONES SPEEDOMETER CO.—Jones, the man who builds speedometers, and has been building them since automobiles got to the point where they were fast enough to need them, calls for no introduction. He is always around when there is anything on, and he always brings his speedometers with him. History sayeth not, but somehow or other it seems as if Jones must have been the original man to show a speedometer in operation at the show. At any rate, he has them there now, lots of them, and the way the hand may be made to crawl steadily around the dial toward the "mile per" mark, or jump at it as if a policeman were coming along behind on a motorcycle, according to the way juice is fed to the little electric motor, is a sight that holds the visitor spellbound until he can almost imagine that he is at the wheel of the car that is running away.

Veeder Manufacturing Company.—Few things illustrate that old saw about the survival of the fittest better than the little Veeder—little because it was the smallest cyclometer that was put on the market. It was one of thousands, but, unlike them, it did not travel the same road as they and the bicycle did. Instead, it kept growing bigger, figuratively, until now it shines forth as the Veeder Tachodometer, though their predecessor, the cyclometer, is not forgotten as are its many competitors of bygone days. As has come to be the custom with this concern, its special instruments are all shown in working order. Standard cyclometers and a wide range of counters for various purposes are specialized by this firm.

Post & Lester.—In addition to its endless line of accessories, this firm shows the Stewart speedometer and mileage recorder. This instrument was designed by J. K. Stewart, president of the Chicago Flexible Shaft Company, a firm which for nearly twenty years past have made a specialty of flexible shafting. The case is a one-piece construction of heavy brass, highly polished and fitted with a four-inch silver-finished dial, the calibration being accurate and the figures so large that they can be read from the tonneau without difficulty. The scale reads from 5 to 60 miles, the delicate mechanism necessary to record very low speeds thus being dispensed with.

Charles E. Miller.—Following the plan adhered to with all the specialties that bear the Miller trade-mark, the Miller speedmeter was put to a thorough and lengthy test before being accorded this distinction. It is an extremely simple, compact and durable instrument, working on the principle of centrifugal force. The governor spindle is made from tool steel,

hardened and ground to size, the flyball and links being of brass, making it very accurate and sensitive. Crown gears are fitted for driving and the large gear for attachment to the hub is made so as to be readily fitted to the wheel of any American or imported car.

R. H. Smith Manufacturing Company.—The same attractive exhibit that helped to show the merits of the Springfield Motometer at the Grand Central Palace last month has been impressed into service at the Garden, and the steadiness with which the indicators of the several instruments that are shown in operation maintain their positions at a certain speed as long as the driving motors keep turning at the same rate is illustrative of the fidelity displayed by these speed and mileage counters in recording the distance traveled and the rate at which it is covered. The Springfield is quite unlike the majority of its competitors where appearance is concerned, besides which it occupies a very small amount of space and forms a slightly addition to the dash of a car.

Warner Instrument Company.—The recording dial of the Auto-Meter strikes the visitor's eye long before he gets within reaching distance of the stand of its makers. It has a long-distance face, so to speak, and though its containing case is one of the smallest of the kind employed for the purpose, owing to the special type of operating mechanism employed, it can be read clearly at many times the distance the driver of a car finds himself from the dash, so that there is no danger of confusing the figures. Magnetism is the controlling force of the instrument and the makers guarantee to renew any Auto-Meter found to be so little as 1-10 of 1 per cent. incorrect at any time within ten years after sale, barring damage from accident or "tinkerites."

Winchester Speedometer Company.—"Fine instruments for fine cars" is the motto of this concern, which is reflected in the character of its exhibit of speed and distance recorders. Centrifugal force is the basis on which the Winchester instruments are built, and they are built not only to do their work accurately but to last. In order to insure this before they leave the factory they are tested for accuracy for every mile of their range from one to sixty. Particular attention is paid to the driving, for upon this depends the service given. It consists of a flexible shaft made of wound steel English wire cable inclosed in a brass casing, the attachment to the case being from beneath, thus avoiding the objectionable short turn.

Oliver Instrument Company.—This firm manufactures the Index speed, trip and mileage indicator of the mechanical, cen-

trifugal type, which is the invention of E. C. Oliver, professor of mechanical engineering at the University of Minnesota. A vertical spindle carries an annular brass weight surrounding it and which ordinarily is maintained in an inclined position with regard to the spindle. Under the influence of speed centrifugal force tends to make it assume a position at right angles to the shaft, the motion being restricted by a spring bearing on a cam surface attached to the weight. According to its makers, the Oliver records everything but the events of a trip.

Hoffecker Speed and Mile Register Company.—Having been on the market for three years, the speed indicating and mileage recording instruments manufactured by this company are well-known to the automobiling public. The 1907 models have been improved in many ways to bring them to modern exacting requirements. One of the most interesting features of the new instruments for the coming season is a ball joint permitting of placing the dial at any angle to the dashboard of the car. The flexible cable is likewise so arranged as to overcome the objections hitherto urged against it in this connection.

Hopewell Brothers.—The Hopewell speed indicator is an accurate instrument, all the parts of which are made from a high grade of tool steel. It is made in two sizes, the smaller reading from 5 to 60 miles per hour and the larger up to 100 miles per

hour. It is capable of reading to within half a mile on any part of the scale, as the distances are uniform throughout the entire range. The instrument was shown in operation by a specially tested machine, giving all the ranges needed, so that its capabilities may be readily demonstrated.

S. Smith & Son, Ltd.—This firm is displaying the only English instrument of the kind offered on this market and which is shown here for the first time. A very complete series of styles is produced by this house, ranging from the smallest and simplest type of speedometer up to a combined clock, speed, trip and mileage recorder and annunciator, all of them enjoying a high reputation in England and on the Continent. They are all made with that painstaking attention to accuracy and durability characteristic of their country origin.

Motor Car Specialty Company.—"Because it is all one instrument" is but one of the claims put forward by the makers of the Lea Speedmeter as a reason for its superiority. The odometer is not an attachment but an integral part of the apparatus. An isolated mechanism not affected by jars to the case, counterbalanced gearing keeping the needle steady under all circumstances, and non-slipping gears mounted on a square shaft, constitute but a few of the advantages that account for its accuracy and consequent long-continued popularity.

RADIATORS, DASHES, FENDERS, ETC.

Briscoe Manufacturing Company.—From plain coil radiators, suitable for small runabouts, to the largest type of honeycomb radiator capable of cooling a 100-horsepower engine, is the important line of the Briscoe Manufacturing Company. Plain coils, coils in casing, coils of small tubes, staggered gang fin, flat tubing, and honeycomb are the principal types, but each one of these is constructed in several forms, giving altogether an almost endless variety of radiating surfaces. Fans are made in two types, one with plain bearing, the other with ball bearing. Blades are made of aluminum and may be either four or six in number for each type. Briscoe hoods are as varied as are the requirements of automobile manufacturers. Fenders also show a wide diversity of appearance even among the standard styles, while any special shape can be made. Aluminum fenders are also manufactured if desired.

Whitlock Coil Pipe Company.—This company is showing the new type of Mercedes honeycomb radiator which was uncovered for the first time at the Palace show in December. It is constructed of square, air-tight cells, separated by thin horizontal and vertical water columns. They are also showing something novel in the shape of a line of seamless welded exhaust and inlet manifolds and water circulating branches, the latter being of copper while the first named is of steel.

The A. Z. Company.—Radiators, metal dashes, mud guards, hoods, mufflers, tanks, sprocket steps, mud aprons, spark plugs, pumps, fans, and other metal fittings for the automobile are handled by the A. Z. Company. Radiators form the most important line; these are of various types and of almost every conceivable shape. Three standard types are the tubular, constructed with a series of tubes, no matter in what shape, whether flattened, crimped or fluted, which individually connect two or more water spaces; the cellular or honeycomb, forming numerous cells around the tubes, no matter if the tubes be round, triangular or square; the coil formed by a tube or tubes bent or coiled, with the water flow through same. Hoods, upon which so much of the external beauty of the automobile depends, are constructed in a variety of designs. Fenders, too, are equally varied in the standard shapes and can be obtained of any special form on order.

Metal Stamping Company.—This exhibit consists of cellular radiators with hexagonal tubes let into punched metal plates front and rear. It also includes a large line of fittings of various kinds, such as bonnet latches, etc.

BEARINGS OF ALL VARIETIES.

Timken Roller Bearing Axle Company.—Several new types of Timken roller bearing for automobile construction, have been prepared for the present season. Timken bearings for cone clutch and transmission, for steering pivot, where they give much greater ease of steering, and for rear shaft drive are particularly interesting types. Excellent I-beam axles, drop forged steering knuckles, spindles, connecting rod arms, and steering arms were shown on the Timken stand. The following cars exhibited at Madison Square Garden are using Timken roller bearings: Apperson, Autocar, Buick, Columbia, Franklin, Haynes, Hewitt, Knox, Northern, Oldsmobile, Packard, Peerless, Pope-Hartford, Royal Tourist, Thomas, Winton.

Hyatt Roller Bearing Company.—The distinctive feature of the Hyatt flexible roller bearing is the roller made from a strip of steel wound into a coil or spring of uniform diameter. The greatest advantage of this type of construction lies in its flexibility, enabling it to present a bearing along its entire length. A line of contact, as compared with points of contact in other systems, constitutes the superiority of the Hyatt. This type has been applied to every part of the automobile chain-driven rear axle bearings, shaft-driven rear axle bearings, hubs, sliding gear, etc.

Hess-Bright Manufacturing Company.—Ball bearings, first used on bicycles, afterwards tried on automobiles and found bad, later modified and found excellent, are now being more and more widely adopted. The Hess-Bright Company earned a reputation in this line and still retains it with their different types of ball bearings. Full type, silent type, step and thrust bearings for light loads and high speeds, for main and line shaftings, street vehicles, electric motors and dynamos, cranes, hoisting engines, and pumps, are all distinct models manufactured by this concern.

J. S. Bretz Company.—The Fichtel & Sachs (F. & S.) annular ball bearings handled by the Bretz Company, consist of two concentric rings or races, grooves in the races, steel balls running in the grooves, and a cage containing and positively separating the balls equi-distantly and keeping them in perfect alignment. This bearing is constructed of steel of an exclusive analysis. The F. & S. bearing is furnished either in the "silent" or "full" type. It may be employed as a radical bearing, taking the load at a right angle to the shaft, or as a thrust bearing by mounting to take the load parallel with the shaft.

SHOCK ABSORBERS ADD TO AUTO COMFORT

Diezemann Shock Absorber Company.—This concern shows a shock absorber which depends for its action on friction. This is obtained between a steel and fiber disk, lubricated by a liberal supply of Albany grease, which is contained within the casing of the device.

Hartford Suspension Company.—The Truffault-Hartford Shock Absorber is perhaps the best known of all shock absorbers, since it was the first to be introduced to this country. It is exhibited by this concern, which certainly has reason to be proud of its past performances. It depends for its action upon friction between disk-like surfaces, automatically lubricated by a special process according to the demands made upon it.

P. M. Hotchkiss.—The Hotchkiss Anti-Jolt Device depends for its action upon the principles of hydraulics. A cylindrical

is an opening in the piston connecting both sides of the cylinder. The size of this opening can be regulated by a needle valve which extends through the piston rod. This allows of easy adjustment for various weights of cars, as well as for varying conditions of service.

Herz & Co.—This firm exhibits the Paternoster shock absorber. This is a device which depends for its "dampening action wholly on friction." It operates through a pair of steel brake bands contracting upon steel drums. These work in a bath of glycerine. It is made so as to be adjustable for both up and down movements.

Kilgore Auto Air Cushion Company.—This concern has the distinction of showing the only pneumatic shock absorber in the show. This device is so arranged as to check both the down-



ESSENTIAL ACCESSORIES AND INVITING SCENERY AND THE EXHIBIT OF THE ROYAL MOTOR CAR COMPANY.

casing is divided into two parts by a radial partition, which is fixed and another to which an exterior arm is connected through a central axle. This part of the device is mounted on the axle. It is connected to the frame by means of an arm attached to the outer end of the axle of the device and a link. A fairly large check valve allows free downward movement as far as the device is concerned, but the rebound is controlled by means of a needle valve, which may be adjusted to suit varying weights of car and road conditions.

Gabriel Horn Manufacturing Company.—This concern shows the Foster shock brake, which consists of a small cylinder and piston, interposed between the axle and the frame of the car. The dampening effect is obtained by the flow of oil from one side of the piston to the other, controlled by means of a by pass.

Graham and Goodman, Incorporated.—This concern exhibits the Graygood Hydraulic Shock absorber. It consists of a small cylinder, closed at one end and having a stuffing box at the other, through which a piston rod works. At its inner end there

ward and upward shocks, and is also arranged so that this checking effect is graduated according to the amount of movement in either direction. The principle is that of interposing an elastic cushion between the axle and the body of the car, its tension or resistance being adjustable to exactly the point required to efficiently absorb every jar, so that it is not stiff and unyielding with the car light and too soft when loaded.

J. H. Sager Company.—This company shows its equalizing springs. These are a sort of supplementary springs which are used to check and control the action of the regular springs on rough roads by counteracting excessive movement in either direction, without at the same time interfering with the free play of the main springs.

Vestal Shock Absorber Company.—This concern shows the Vestal shock absorber. It depends for its action upon a friction collar and drum, between which is interposed a soft and easily replaced leather or fiber ring. A special point about this device is that it allows a small amount of spring play before the friction device comes into action.



*"GRAND MARCH"
of the OFFICIALS
and their GUESTS*

*A CATALOG
FIEND*



*Down in the
Rathskeller sale
were also made.*



*No WONDER
THE EXHIBITS
ARE INTERESTING.*

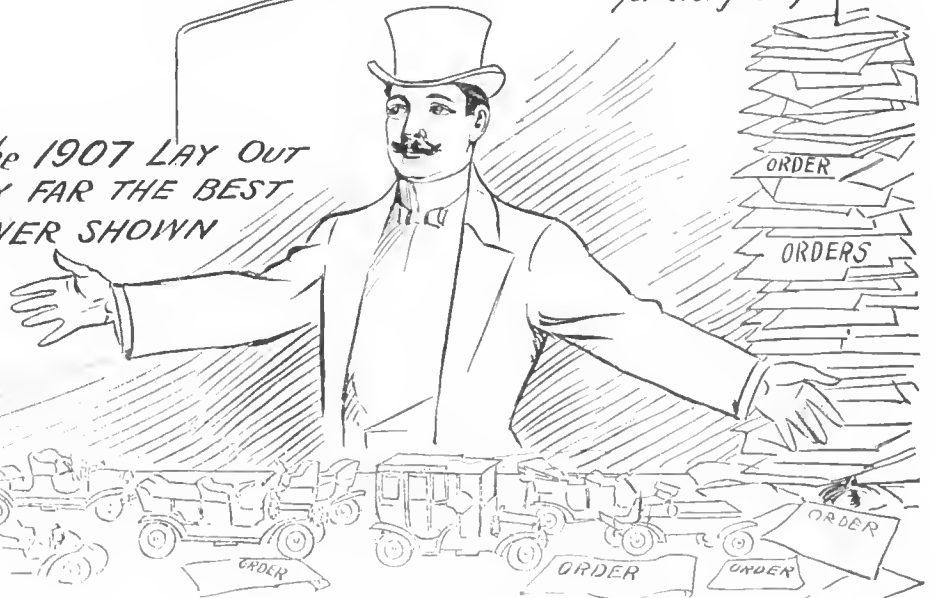


*Col. Pope had
a welcome
for everybody*



*A SWISS
Guard*

*The 1907 LAY OUT
BY FAR THE BEST
EVER SHOWN*



PLENTY OF BUSINESS FOR 1907

SOME VARIED IMPRESSIONS OF THE SHOW BY "THE AUTOMOBILE" ARTIST.

PRESENT AND FUTURE OF A GREAT INDUSTRY

BRIGHT is the present and promising the future of the growing automobiled industry. Optimistic is the general tone of those engaged in manufacturing the motor-driven vehicle and its many component parts and accessories. Occasionally a skeptic is encountered, but he is only the exception that proves the general feeling of satisfaction at the outlook. In the opinion of many, automobile manufacture is only really begun in this country, and the quickness with which the outputs of the established concerns are sold to agents, who would not invest unless they were confident of the demand in their respective vicinities, tells its own story. Coincident with the coming of the automobile has been the pronounced call for the improvement of the roads, and this same rebuilding of the highways is going to result in the sale of many more thousands of cars, for the farmer is awaking to the value of the automobile, is buying now, and will buy in greater numbers in the near future. Read the comments of those in and out of the trade on the present and future of the greatest industry ever established in this or any other country.

DISTINCTIVE, STABLE, UNIQUE INDUSTRY.

By M. J. BUDLONG,

PRESIDENT ELECTRIC VEHICLE COMPANY.

The present status of automobile making certainly stands unique in the history of industrial enterprise. Twelve years ago hardly any automobiles were in use. To-day it is estimated that the value of cars in the hands of purchasers exceeds \$200,000,000. On this side of the water this diversion of an immense amount of capital into a new channel has mostly taken place within five years, and so naturally and smoothly as to cause no particular stress in any direction. Now and then a purchaser may have mortgaged his house when he ought not have done so, but it is strikingly evident that the great majority of cars in use in the United States belong to owners who can afford to have them; and this fact points strikingly to the wonderfully prosperous condition of the United States at the present time. As for the future, the industry can look the new year in the face without flinching and all indications are toward prosperity for several more years to come. The advance bookings for 1907 deliveries break all previous records. Not only is the popularity of motoring keeping pace with the ability of the manufacturers to supply the demand for cars, but motorists are taking a more sane and conservative view of automobiling than ever before, which is an especial indication of the permanent stability of the industry. The principal obstacle in the path of recent progress has been accidents, 95 per cent. of which were purely avoidable. There is now everywhere manifest a tendency to frown down recklessness and the work of ignorant operators; and this perhaps more than any other one thing will make for rapid increase of sales in the future.

GOOD ROADS AND GOOD TRADE GO TOGETHER.

By ROBERT P. HOOPER,

CHAIRMAN A. A. NATIONAL HIGHWAYS COMMITTEE.

It looks to me as though the prospects for the sale of new cars will continue as long as the public is making money as fast as it is now. The point that is particularly favorable to all automobilists is the fact of the large number of machines that are being purchased by the farmers and all classes of people living in the outlying districts. Already we see a very marked evidence of a friendlier feeling toward automobilists than has ever existed before, and I believe that the automobile owners are working together to help add to this good feeling, to a very much greater extent than they have ever done before. Further, there is no doubt that the adoption of the automobile by the farmers has already created a demand for roads, which we could never have secured in any other way. We have no difficulty whatever, at the present time, in securing favorable expressions of opinion in regard to good-roads laws, and also promises of help from men that have been antagonistic to us for a long time past.

DEMAND INCREASING FOR GOOD AUTOS.

By H. M. SWETLAND,

PRESIDENT CLASS JOURNAL COMPANY, PUBLISHERS "THE AUTOMOBILE."

The outlook for the industry is most encouraging. The demand for well built automobiles of every description is increasing rather than diminishing. The sale is still hampered to some extent by unjust garage, repair and supply charges, but these accessories to the industry are being conducted on a more substantial basis, and the "get rich quick" factor is being slowly eliminated. Uniform standards of parts in the various types will now follow as in railway equipment, and better material and workmanship will mark the progress of the year.

The buyer is becoming educated and more discriminating, and cars of all classes will be selected with more consideration of adaptability to the special requirements. Touring cars will not be bought for runabout service, and runabouts will not be purchased for delivery vehicles, all of which will tend to the greater satisfaction of the purchaser. For all special services, particularly special commercial uses, automobiles will be constructed from plans and specifications in which the requirements will have been considered from a standpoint of advanced engineering.

The fact that the industry is on a sufficiently substantial basis to attract our most influential and progressive engineering ability, as well as abundant capital, is proof of the possibilities and permanency of the industry. We only need to continue high-grade construction in all lines, give the user honest consideration during his educational epoch, and avoid provoking drastic legislation by reasonable use of public property. The future then is beyond any question.

MAGNITUDE OF PRODUCTION A FACTOR.

By HENRY FORD,

PRESIDENT FORD MOTOR COMPANY.

American supremacy in the automobile industry must be won, as in other branches of international commercial competition, by following American methods and doing business on the scale to which we are accustomed, and which to our foreign competitors seems of almost impossible magnitude. In locomotive building, bridge construction, railway and steamship enterprises, and in other branches, Americans have outstripped all competitors by the magnitude of their operations. The scale on which we Americans do business is made possible by our faculty of reducing the most difficult and seemingly formidable problems to the simplest and fewest terms—by so designing that every operation from first to last will be as simple as may be and making as many parts as possible standard in form and size and therefore interchangeable. Strange as it may seem, an American bridge building concern can furnish an estimate on a bridge to span a river in South Africa, and need not even know the width of the river or the height of the banks. Three cents and a fraction per pound is the

price of bridges—the amount it will weigh depending on the various dimensions, which latter have long since been worked out and reduced to simple tables. Looks easy when you think of it, and yet our foreign competitors have never been able to reduce bridge building to those terms—nor to compete in estimating on a bridge job with Americans. In locomotives it is the same. Even watches come under the same head—and the automobile comes between the two, combining as it must the strength and power of the one, the accuracy of the other. Some years ago the Swiss government sent an emissary over here to investigate and report on the watch industry, the American product having then only begun to cut seriously into the revenues of the Swiss national industry. He was an honest emissary—and a worthy one, since he believed it better that his people should know the truth, even if that proved unpalatable, than a more toothsome fabrication which should in the end be expensively misleading. His report was to the effect that the Swiss attitude toward the American product was wrong. That the belief that the Yankee product was inferior as well as cheaper was a superstition born of racial prejudice. And he stated frankly that his investigations had shown him that the hand-made Swiss product could not even approximate the accuracy of the machine-made American watch. They must then adopt American methods or suffer in the competitive field. Result, watches made in Massachusetts are now sent to Switzerland, reshipped to America, and sold to Americans as “imported” time-pieces.

We have a very great advantage over the foreign maker even when he has adopted, as nearly as he can, our own methods. He cannot hire American workmen—men of a higher intelligence, because more self-reliant, self-respecting and more ambitious. It is a penalty the older countries must pay for long years of oppression and suppression of their people. The German is a better worker in America than he was in Germany, the Frenchman than in France, the Irishman than under British rule. We get the benefit of all that.

As for the future of the industry—that is assured. There is apparently no diminution in the demand, and as cars are made in greater quantities and prices correspondingly lowered the market is enlarged immeasurably. There has not been a month in the year that the Ford factory has not been behind its orders—this applies to our high-priced six-cylinder model as well as to the four-cylinder runabout. Perhaps that is due to our having adopted at an early date a policy which we knew the future would make necessary—I do not know. Anyway, I believe the industry has just begun to develop, and he would be bold indeed who should predict that the business has reached its zenith or that a serious decline will begin during the lifetime of men now living.

FUTURE ONE OF SPLENDID POSSIBILITIES.

By G. V. ROGERS,

SECRETARY MITCHELL MOTOR CAR COMPANY.

The subject of the automobile industry is one that, try as we will, it is impossible to view it in any other than the most optimistic light. It seems to us that the possibilities of the automobile have developed more, and have been more generally understood and appreciated, within the past twelve months than during its entire previous life. They are not only used to-day for work thought beyond their capabilities, but they are making undertakings possible that were undreamed of and impossible without their aid. In other words, their advent is creating a demand for themselves unknown heretofore, and the possibilities of which we can only dream. There is no doubt but that there is a shortage to-day and that the country could absorb twice the number of cars that will be made during the year of 1907. Within ten years it will be one of the four largest industries of the country with the most rapid growth, not even excepting railroads, that the world has ever known.

MORE DIFFICULT TO PRODUCE THAN TO SELL.

By ALBERT L. POPE,

VICE-PRESIDENT POPE MANUFACTURING COMPANY.

In the present state of the industry it is more difficult to produce good cars than to sell them. The demand is strong for such machines as have won in past seasons a reputation for dependability and efficiency, and at the same time purchasers are not easily attracted to makes of unknown quality. If this analysis is correct there certainly is a market for all the good cars of 1907. Without question the automobile business is firmly established, and pleasure vehicles will continue to increase in popularity and general use for some years to come, a condition of affairs that is bound to insure good roads throughout the entire country. By that time the commercial vehicle in its various forms will have reached such a state of development that it will in a large measure replace the horse-drawn cart, at least in congested centers of trade.

New uses for the automobile are constantly being hit upon. One of the cleverest that has recently come to my attention is the plan of using an automobile as a part of the equipment of a bank, to deliver moneys to customers and collect deposits from them. This is a good business policy, and in line with the developments of the age. It naturally follows that the bank which gives the best service to its patrons will get the largest amount of business. Why should not the banks go out in this way and bid for an increase in their line just as merchants and manufacturers do?

CONSERVATISM IN DESIGN A SAFE FACTOR.

By E. H. PARKHURST,

VICE-PRESIDENT PERRIN MOTOR CAR COMPANY.

The automobile industry in this country is on a very satisfactory basis, and will undoubtedly remain so as long as the present conditions of commercial prosperity continue. The tendency is still toward the high-powered cars of large seating capacity, whereas abroad there seems to be an increasing demand for the lower-powered cars, particularly for the closed type. It is probable that in America it will be necessary to use cars of higher power than are used abroad because our road conditions require it. At the same time I believe that in the future there will be some readjustment of public sentiment, and that cars of smaller horsepower than we are now making will come into favor. It is a fact that we use cars mainly in the city, where excessive power and speed are a distinct disadvantage, as it involves longer cars, heavier cars and a higher cost of maintenance.

The public does not regard freak or experimental cars with favor, and has come to understand that conservatism is safer and that a good car is not the result of chance, but on the other hand is the product of good design, good material and good workmanship, and after that the elimination of weaknesses and bad features that are found out only through experience.

Although there is at present considerable interest shown in the six-cylinder type of car, it should not be supposed that this interest amounts to dissatisfaction with the present four-cylinder type. There is much that the public wishes to know with respect to six-cylinder cars, and much that must be proven by their makers before there will be any general demand for them, but I think that now they are regarded as somewhat of an experiment.

The great demand for the pleasure type of automobiles has prevented, and will prevent for some time to come, the development of the commercial car. The importance of the field for commercial vehicles is not being overlooked, however, and when the supply of cars more nearly equals the demand, or when the demand may fall off, there will certainly be a rush on the part of all makers to build commercial cars.

THE LAW OF SUPPLY AND DEMAND.

By GEORGE E. FARRINGTON,

TREASURER AMERICAN AUTOMOBILE ASSOCIATION.

Supply and demand is the never-changing basis of commerce and industry, regulating prices and quality as well as quantity. It has been interesting watching the effect of this law in the automobile industry. For pleasure machines it seems as if the supply had about reached the demand, and would soon pass it. This will mean still more attention to surpass in perfection of finish and construction of the motor, as the principle of operation seems to be nearly perfect, as are the passenger accommodations. Therefore we can assume that competition with the decreased cost of manufacture of parts, and that the user will be no longer called upon to pay heavily for experiments of the builder and cost of selling, will result in much lower prices for better material and, therefore, machines. The haste to manufacture to meet the demand is the principal reason that the domestic cars have failed so far to meet the finish, workmanship, and wearing qualities of the best imported cars, and again our labor and material are and have been much higher in cost than abroad. Competition will soon make it imperative for us to meet the standard of the best, which we can do.

The wise manufacturer of automobiles is to-day giving much time and attention to the commercial vehicle. This is a field without limit. Speed, durability, cost of maintenance, regularity in good or bad weather, excess of load, less space occupied, and the saving of the horse, who so often suffers through brutality, overwork, and overload, are unanswerable arguments.

A RATIONAL TENDENCY IS OBSERVABLE.

By F. L. SMITH,

VICE-PRESIDENT AND GENERAL MANAGER OLDS MOTOR WORKS.

The most healthful sign of the times for the automobile manufacturer, and for that matter to the distributor or agent, is the fact that the craziness of the whole game is rapidly passing away. The experienced buyer to-day does not attach the old importance to the magical word model, as applied to the machine made and delivered in one year as against the previous year's output from the same factory. A car that is good to start with in any given year needs only to be kept up to date in the little detail matters that make for the safety, comfort, and peace of mind of the owner and driver, and the limit is also being rapidly reached in the absurd and useless additions to simple mechanical parts, which ought to be enough to keep the average layman busy learning his machine and understanding that as long as he has to do with a power plant on the flowing road it is well not to let his mind run away with the dazzlements of extra fixings, double-jointed action, and forty-odd complications, to effect a very simple move which the driver-owner these days is qualified to master without much mental strain.

If you take the evolution of the single harness for a horse you will discover that straps, buckles, and all the working parts are made of the best material and as simple as it is possible to make them, and that they are cut down to the fewest number—not for the sake of economy, but for the sake of the man that has to hitch the horse and drive him. You might as well take pleasure in the invention of an automatic attachment to fasten around your waist, and by tripping a trigger in your right hand vest pocket automatically remove your hat and salute a passing acquaintances to save the mental labor of performing that courtesy by means of the thumb and forefinger acting in conjunction with your elbow joint and full arm.

The whole trade is getting extremely sensible these days, and it is not the novelties and the strange stunts that people lie awake nights to think of that appeal to the buyer—which is, in a word, to say that straightaway excellence in material

and workmanship, backed by good records and good friends, is a final proof of a good automobile as it is of every other commodity commercially dealt in in these great United States. There appears to be room for everybody that makes a strictly first-class machine and sells it honestly. For the rest it is merely a question of the frequency with which angels are met to foster the existence of yellow dogs who have no real reason for being. All of which has come about by the sober second sense of the American buying public and not by any crafty effort on the part of manufacturers or selling agents. It is also to be noted that the strong trade papers, and the most progressive, have been extremely conservative and sensible in their views as to the development of the industry. Altogether the automobile manufacturer has much to be thankful for on the beginning of the year, not the least among which is the above-mentioned general prevalence of a rational outlook on the whole industry.

AUTOMOBILE'S PLACE FIRMLY ESTABLISHED.

By STANFORD L. HAYNES,

EX-PRESIDENT AUTOMOBILE CLUB OF SPRINGFIELD, MASS.

The automobile, it seems to me, has already firmly established its place in the world.

Its popularity as a means of pleasure is without a question.

As a means of utility, from my own experience, I know I should find it extremely difficult to accomplish the work I am called upon to do without it, and for a light delivery service with which I have had personal experience in my own business I know that one car will do the work of three horse-drawn vehicles—do it economically, and with better despatch. During our recent holiday rush of business one car has made as high as five hundred deliveries for us in one day, covering a distance of over seventy-five miles.

No physician to-day, having a practice requiring three or more horses, can afford to use them, as one good car, with a competent man to operate and care for it, will reduce his time in making calls at least one-quarter, and a busy doctor's time is certainly valuable. From my observation, however, he should not try to care for and operate his own car.

I am looking forward to the day when we can have special rights of way for the automobile between the larger cities so that a business or professional man can leave his own office at any hour that suits his convenience best and arrive at his destination in his own conveyance, entirely independent of the railroads and at no great loss of time, if any. If such rights of way were established I am confident they would pay for themselves even to-day, as the convenience offered would be highly appreciated by many a business man who would willingly pay any reasonable charge for the time saved and the convenience gained. I trust some move may be made in the near future toward the establishment of such rights of way that the automobile may more fully fulfill its mission.

THE TENDENCY TOWARD SIMPLICITY.

By CHARLES E. DURYEA,

PRESIDENT DURYEA POWER COMPANY, INCORPORATED.

I always thought I had a pretty big idea of the future of the auto business and my friends agreed with me on this point, but I confess that it is growing beyond my expectations. I am surprised and pained to see the growth toward cumbersome, complicated vehicles, although I know it is a matter of history that progress is made from the complex to the simple and that the large, clumsy, overgrown affairs ought to be expected first. I am sure that the future will develop simple, powerful, serviceable vehicles, more so than can be found at present, and that the use of these vehicles will extend to the masses just as did the bicycle.

More specifically, I saw signs of simplicity in the designs of vehicles exhibited at the last show. The combining of the trans-

mission gear with the differential gear box on the rear axle groups the mechanism in two places instead of three and gets a greater proportion of the weight on the rear axle—a move decidedly proper. The success of several vehicles having the motor at the extreme rear is a straw showing what will happen to others with like placing. There is more room for the motor at the rear than at the front, the weight is more effective, the power is transmitted with less loss and the passengers may be moved slightly forward, so as to be carried between the wheels with greater comfort. This seems to me the next design in automobiles. The motor went to the front to secure accessibility and cooling, but the cooling can be had at the rear, and the room at the rear for accessibility is greater. I believe the public are appreciating more and more light weights and large tires, and this combination is the solution of the tire trouble. Incidentally large wheels also serve to smooth rough roads, and rough roads, unfortunately, are the American kind.

COMING ALONG, BUT NOT IDEAL.

By W. S. GORTON,

SECRETARY AND GENERAL MANAGER STANDARD WELDING COMPANY

At the present time the greatness of the "great" automobile industry is largely displayed in the columns of a great number of so-called automobile journals, most of which are simply reprints of old matter and photos of machines directly advertising some one product. Of the business, would say, that in the judgment of the writer it is improving materially and bids fair to assume very large proportions with the successful introduction of the commercial vehicle.

Great improvement has been made in the general mechanism of the car during the past year as to strength, reliability and convenience of operation and repair, but it is still far from the standard of excellence which must be arrived at before the motor car can become an altogether popular vehicle. When the ordinary automobile can be used with little fear that anything will go wrong except the rubber tires, it will have a great many more advocates than it has at the present time, as well as users.

If the work which is now being carried on toward the perfection of suitable highways for automobile use and other uses carries through, great credit must be given the automobile industry for bringing about a condition which is so much needed, especially in the central, western and southern portions of this country, where good roads in some sections are practically unknown for six months in the year. If the automobile can bring about the molding of public sentiment in this direction, all the time and means that have been expended upon this interesting and acceptable method of transportation will be well placed and prove of great advantage to the country at large.

SOUNDNESS AND STABILITY IN FUTURE.

By H. E. RAYMOND,

VIC-PRÉSIDENT THE B. F. OODRICH COMPANY.

I can only voice, what is undoubtedly the universal consensus of opinion, that the future of the automobile industry is tremendous in possibilities. The present can be aptly criticised for its extravagance in detail and wholly impossible surrounding features of unbusinesslike methods of procedure. This is not due to lack of business management, but to the swift moving events that have carried the industry to a feverish point before mental activity could assimilate it. The future will see a readjustment of methods and consequent soundness and stability that will really mean much more to the trade at large than the present seeming prosperity, which involves the error of judgment now prevailing. There is nothing alarming in present conditions, which might, however, be termed the cock-tail to the drawing of the more solid business lines to come.

MATERIAL MAKERS HAVE BEEN SWAMPED.

By E. D. FRETZ,

SECRETARY AND TREASURER LIGHT MPO. AND FOUNDRY COMPANY.

As every one well knows, the automobile industry is pushing forth in leaps and bounds, unprecedented in its growth, so that accessory manufacturers have not been in position to build additions to increase facilities rapidly enough to meet the urgent demands made upon them by automobile manufacturers for prompt service. While the automobile industry in all its details has grown very rapidly, it is our opinion that the industry is only in its infancy and that there will be little abatement within the next three to five years.

In our own line, as manufacturers of aluminum, manganese bronze and bearing metal castings, we have not been in position to measure up within fifty per cent. of the heavy demands made upon us for our product. The rapid growth has used up raw materials so fast that the producers are unable to supply the demand, and they, in turn, are spending millions of dollars to bring the supply of raw materials within the current demands of this great industry. Although we have large facilities for supplying castings, as far back as last September it became apparent to us that we could not take care of the many demands upon us and have been obliged to turn away many applicants with orders for our product, believing that it were better for us to give satisfactory service to a limited number than to attempt to supply an unlimited number. The future to us looks good, although competition is very keen. We are of the opinion that all honest manufacturers will have all they can do for at least from three to five years.

MAN FROM MISSOURI HAS BEEN "SHOWN."

By ROY F. BRITTON,

SECRETARY-TREASURER ST. LOUIS AUTOMOBILE CLUB

I speak from the standpoint of a Missourian. This State seems to be in a peculiar situation. Missouri ranks fifth in population, seventh in wealth, and eleventh in the number of automobiles. Probably this is accounted for by the bad roads in certain sections of the State, but I think our unreasonable law has had more to do with it. For the past four years autoists in Missouri have been required to operate their cars under a law limiting the speed to nine miles per hour and requiring the payment of a \$2 license fee in each county. This is practically prohibitive, and I think that under the circumstances the automobile progress that has been made in this State is remarkable.

From present indications it seems that the coming season will be the biggest one in the history of automobiling in the country. An extraordinary number of machines for 1907 delivery have been sold in St. Louis. We have every reason to believe that our Legislature has recovered from the attack of "autophobia" which it suffered in 1903, and will give us, at its next session in January, a fair and reasonable law that will tend to promote better conditions. As a matter of fact, I think we are really just beginning to get into the "game" out here, and I have great expectations for the future.

A YEAR OF GREAT PROSPERITY PREDICTED.

By VAL. DITTENHOFER, JR.,

PRESIDENT CINCINNATI AUTOMOBILE CLUB.

Automobiles have really only begun their great work, especially in our city, and from all indications there never will be so prosperous a year as the one we are now entering upon, for the majority of the people are talking new machines. Not only will they be used for pleasure, but also by business houses, all classes of which are now taking a great interest in the development of machines for commercial purposes. Taking it all in all, I think prospects of this great industry are more than encouraging for the present year.

THE AUTO AS A COMMERCIAL FACTOR.

By H. A. GRANT,

MANAGER ADVERTISING DEPARTMENT MAXWELL-BRISCOB MOTOR COMPANY.

The question is often asked, Will the automobile follow the bicycle? There are two excellent reasons why it will not. The first, the bicycle was never a factor in commercial life. It is true that it was used quite largely in transporting individuals from place to place, but it had no bearing on the commercial life of the large cities. The automobile delivery wagon and automobile truck are fast replacing the horse-drawn vehicle for fast service, and it will relieve more than any other one thing the present congested condition of our great cities. It will also enable the streets to be kept in a more sanitary condition.

In the pleasure vehicle line there is no reason or indication why they should not be as popular in years to come as they are at present. The automobile has brought back the old coaching days and has been the means of developing good inns throughout the country. It was only three or four years ago that a good hotel outside of our large cities and a few of the largest towns was a rare occurrence; now there are many fine inns that owe their existence almost entirely to automobile parties. England and France are still ahead of us on good roads and good country hotels, but it is gradually being changed, and as the automobile becomes more used by all classes, just so soon will we have good roads and good inns throughout the country.

GOOD ROADS THE INDUSTRY'S HOPE.

By S. D. WALDON,

SALES MANAGER PACKARD MOTOR CAR COMPANY.

The future of the motor car industry is dependent, to a great degree, upon highway improvement. Good roads propaganda and then quick, effective, extensive practical work in the making of roads are what count in firmly building up the motor car business. The Packard Motor Car Company has absolute faith in the permanency of the motor car business and is looking to the future for its profit. It also realizes that one of the best opportunities for creating a general faith in the permanence of motor cars as road vehicles lies in good roads work. The automobile industry must not expect profit now. The future is of too great consequence to allow it to be scorched with hot air methods intended to yield immediate return. Thus may the industry better itself most by never-ceasing endeavor focused upon the future; thus may the automobile industry do itself direct and lasting good by doing whatever and as much as it possibly can for better highways in this country. When the highways of America equal those of the popular touring countries of Europe, then may we readily expect America to be at the top of the heap in international motor car trade.

OUTLOOK IS VERY ENCOURAGING.

By J. P. COGLIN,

PRESIDENT WORCESTER AUTOMOBILE CLUB.

From the manufacturer's standpoint it would seem that the sales for this year would exceed those of any other without a question. The manufacturer appears to be better prepared than ever before to meet this condition, as the 1907 models have been on the market for some months in a great many cases. The tendency seems to be toward larger horsepower, while the style and type seem to have been mixed.

With reference to roads, there is great interest created by the Long Island Parkway. We have indications that something may be done in that line in New England. There is no question but what automobiling has caused a lot of agitation for good roads, and that results are being accomplished. There is also some question as to whether automobiles impair State roads as much as horses. It would appear that it was

the combination of the two that was destructive; that a road used exclusively for automobiles will not tear up nearly so fast as when a horse and narrow wheels go over it, which tends to cut the surface. We will have this measure before us undoubtedly to contend with in the Legislature this winter.

It is not the purpose of the Massachusetts State Automobile Association to propose any legislation this winter to any extent. The ground will be taken that the present law has not yet been fully tried out. However, it is proposed to watch for bills detrimental to automobile interests, and if any are introduced will oppose them.

A SURVIVAL OF THE FITTEST.

By M. L. GOSS,

SECRETARY BAKER MOTOR VEHICLE COMPANY.

The new year opens most auspiciously, the sun light of prosperity illumines the outlook, the public interest in automobiles is intensified beyond any previous experience. There is promise of a quick market for quality and possibly good business for bad and some sales for the indifferent, but still I believe that 1907 is to prove a crucial period of the business. It is the beginning of the elimination, the primitive days have passed. The crude first machines (and they all look alike to the public) were more fascinating than the telegraph, telephone, phonograph, electric light, camera and all other of the new inventions of the nineteenth century. These old machines have gone, we hardly know where. The people have grown more wise, more mechanical, more discriminating, and now differentiate between automobiles of reputation and distinctive characteristics of quality from cheap made cars of questionable worth, to say nothing of those that are absolutely bad. Fancy catalogs and extravagant advertising, attractive as they may be, are no longer convincing. The speed clown has ceased to be a stellar attraction in the great automobile circus. We are all getting back to earth, settling down to the legitimate, and, like all lines that have gone before our time, it is the survival of the fittest.

PREDICTS HORSES WILL BE RARITY IN 1915.

By ASA PAINE,

PRESIDENT FLORIDA EAST COAST AUTOMOBILE ASSOCIATION.

American brains and machinery are successfully producing many very superior automobiles which are suitably adapted to the road conditions of this country. Foreign makes of automobiles are being driven from our markets by equally as good machines at much less cost, made by many very reliable concerns. We now have a surprising array of reasonably priced cars, most of them substantial and well worth the prices asked. I want the pleasure and satisfaction of seeing my prediction come true—that by 1915 horse-drawn vehicles of all kinds will be a decided rarity, at least on the congested thoroughfares of large cities. Racing under proper conditions is of great importance in the complete development of a strong, safe, and good motor car, and should be encouraged by manufacturers. I believe the good roads problem is being rapidly solved and that an automobile of some kind will soon be a universal necessity in every well-regulated family.

FORECASTS AND CALCULATIONS INADEQUATE.

By PETER L. STEENSTRUP,

SECRETARY AND SALES MANAGER HYATT ROLLER BEARING COMPANY.

Words are really lacking in the staid old English language to express the stupendous, marvelous and gigantic development of this young but overgrown industry. The effect that the automobile has had on our business is reflected in the majority of other cases and tells the story possibly plainer than any thing else. As manufacturers of an anti-friction bearing for a large variety of purposes, the use of this bearing for auto-

mobiles was four or five years ago a mere incident in our general business. During the past years we have found ourselves constantly short of facilities, although each year we have erected such additional buildings as seemed more than ample to even the most sanguine expectations, so far as the increase of business is concerned. We have, in common with hundreds of other manufacturers, found ourselves in the unique position of being unable to sufficiently provide for the increase of such business as is practically forced upon us because of our inability to obtain in the market delivery of machine tools in less than from eight to fourteen months—machine tools which a few years ago could have been picked up in stock in any big city.

The growth of the automobile industry, which two years ago was predicted as approaching its zenith, throws all forecasts and calculations to the winds. The industry to-day is scoring a "beat" on all other industrial developments within the memory of man, and the ultimate outcome is completely hidden in a seemingly endless and accelerating demand for cars.

NOTHING BUT A PANIC CAN STAY PROGRESS.

By EZRA E. KIRK,

GENERAL SALES MANAGER B. R. THOMAS MOTOR COMPANY.

I regard the automobile business as the most wonderful development of an industry that this or any other country has ever witnessed. I have given more or less thought to the business, and have tried to look at it from various points of view. I have not the reputation of a pessimist, and certainly try not to be an extreme optimist. Looking at the situation from various points does not disclose a cloud on the horizon. The decided improvement in the quality of the production argues for the continued prosperity of the business as a whole. In my opinion, the only condition that could bring about a change in the present conditions that surround the automobile business would be a decided panic, and even this condition would not prove as serious as it would have in years gone by. The greatest danger to the industry is that of over-production. I believe, however, that the manufacturers have discounted this danger, and are proceeding along cautious and consistent lines.

As my efforts have been confined entirely to the building and merchandising of pleasure vehicles, I do not regard myself competent to even venture an opinion on the commercial wagon. From the point of view of an outsider, however, I should say that the successful commercial wagon was in sight; in fact, had arrived, and that very little further development is required to warrant its production in quantities. I believe that the volume of production of commercial wagons would so far exceed that of pleasure vehicles that comparisons will hardly be possible.

UNCERTAIN STAGE OF INDUSTRY HAS PASSED.

By GEORGE M. DICKINSON,

NATIONAL MOTOR VEHICLE COMPANY.

We have never, in our automobile experience, felt as much encouraged over the prospects as we do at the present time. We have found a great demand for our product in all portions of the United States, and we understand that all makers of good cars are as busy as ourselves, and from all we have been able to learn these conditions will prevail for some time to come. The automobile business has passed that uncertain stage when the purchaser of a car felt he was buying a "pig in a bag," as it were, but he purchases a machine now from a reputable maker with perfect confidence, and we are quite sure there are a great many buying automobiles who in the past have felt that the business had not reached the proper stage of development to make it worth their while to purchase a machine. We look forward to a heavy demand for a car, such as we are making for some years to come, and are laying our plans accordingly.

MUCH GREATER THE FUTURE THAT AWAITS.

By ALEXANDER WINTON,

PRESIDENT WINTON MOTOR CARRIAGE COMPANY.

Great as the automobile industry now is, its future will be far greater. The manufacture and use of pleasure cars, which have demonstrated the practicability of the self-propelled road vehicle, is simply a primary step toward the manufacture of cars destined to do the world's trucking. Thus far American manufacturers have been so extremely busy manufacturing pleasure cars that the wider and richer field of commercial wagons remains to-day practically uninvaded. This condition is certain to be changed. The change may not come rapidly, and preferably it should not come with a rush, for the commercial vehicle proposition, presenting somewhat different aspects from the pleasure car proposition, is one to be handled with deliberation.

The demand now exists for power wagons capable of doing greater work at less expense than is possible with horse-drawn vehicles. In recognition of this demand our manufacturers are devoting themselves quietly, but none the less seriously, to the production of vehicles which shall be wholly successful from the instant of their introduction. It would be a vital error to market power wagons with undue haste, since the use of unsatisfactory wagons would prove an unwelcome advertisement and seriously retard progress. Established manufacturers appreciate this possibility and need no warning. The danger, to my mind, is threatened by the possible invasion of the power wagon industry by latent capital bent upon the quick production of big dividends.

MAKERS ARE TO BLAME FOR DELAYS.

By H. S. WHITE,

ASSISTANT GENERAL SALES MANAGER SHELBY STEEL TUBE COMPANY.

At the present time every automobile manufacturer of importance has all the work that he can take care of, and with continued prosperity throughout the country this condition should continue throughout the year of 1907. We realize that one serious handicap to the automobile manufacturer this season is the inability to secure as promptly as they may desire material which enters into the construction of their vehicles. This, however, is largely the fault of the manufacturers themselves, as it has been the custom in the past to defer placing orders for material until such a time as their engineering department had completed all of their experiments and plans.

For the good of the trade, it would be wise on the part of the manufacturer to complete his experiments far enough in advance so that there should be no difficulty whatever in placing specifications four to six months in advance of their actual requirements.

For our own particular product there has been an exceptional demand from all parts manufacturers and the completed vehicle manufacturers, and we feel convinced that the year of 1907 will be a very prosperous one for all connected with the industry.

USELESS WEIGHT MUST BE DISPENSED WITH.

By H. H. FRANKLIN,

PRESIDENT H. H. FRANKLIN MANUFACTURING COMPANY.

Up to date the automobile has not been the money maker expected. Only the leading makers and dealers have been able to show satisfactory profit. The buyer of the automobile has also been a loser. He has had to buy the experimental product and with the maker has shared the enormous cost of development. But here is the funny part of it—both buyer and maker have thought that with the appearance of a car that was reliable and so built as to stand several years' use, the expensive development and changing business would be at an end and both would settle down, the one to enjoy, the other to make, much profit. Not so! Along with the present reliability and lasting qualities is an element—a big trouble—that must be

overcome. It is useless weight. The buyer now knows that his heavy car must be replaced by a light one and the maker is already groaning because of the pending burden of new design and new methods of construction. So acute is buying sentiment that the heavy car maker recognizing it no longer gives weights, and is sore pressed if asked to do so.

A FUTURE THAT IS MOST PROMISING.

By W. C. MARMON,
PRESIDENT NORDYKE & MARMON COMPANY.

The future of this great business is most promising. The demand for pleasure vehicles will no doubt increase for some time to come, and in our opinion there will always be a large demand for practical vehicles. While great improvements in construction are going on there is a noticeable change for the better taking place in business methods, and there is a gradual working out of the whole proposition towards a sane and substantial business basis which is most encouraging.

The commercial vehicle proposition, which has come to the front rapidly, will soon be another strong factor in making the business a flourishing industry for many years to come. We do not pretend to supply the demand for our cars and we presume that nearly all other manufacturers are in the same boat. There is bound to be an end to this condition, however, though there is probably room for more manufacturers just now. Latter on a weeding out may be expected and the proposition will resolve itself into one of the "survival of the fittest."

IT IS SERVICE, NOT FASHION, THAT COUNTS.

By THOMAS HENDERSON,
VICE-PRESIDENT WINTON MOTOR CARRIAGE COMPANY.

In careless speech the popularity of the automobile is sometimes referred to as a "fad." To that expression I object. A fad is defined as a passing fancy or a capricious hobby, and neither phrase is accurate insofar as the motor car is concerned. To be sure, Mrs. Jones may insist upon her husband buying an automobile because the Greens next door have one, but I know from experience that the Jones family will continue the use of their car even should the Greens cease to be factors in the neighborhood social life. And that is because the motor car performs a service which its owner finds he cannot get along without. Indeed, once he realizes how much more largely the motor car contributes to his enjoyment of life, he lastingly regrets his delay in purchasing. And it is wholly upon this single item of service that the whole future of the motor car rests secure.

DENVER AS AN AUTOMOBILE CENTER.

DENVER, COL., Jan. 14.—It is doubtful if another city in the country of equal size can equal Denver's record for 1906 automobile buying. There are seventeen agents in the city, who together represent forty-five different makes of motor cars, and the agents sold to Denver people a total of 560 cars of an aggregate value of \$1,065,500, or an average value approximately of \$1,900 each. In addition to selling to Denverites 560 cars, the local agents sold 175 to customers residing in various parts of the State. These cars had a value of \$332,450, or an average value of \$1,900. Thirteen more cars valued at \$47,600 were purchased by persons living in States west and north of Colorado.

The grand total of the automobile business in the matter of 1906 models and from the few 1907 models shows that 7.8 cars, valued at \$1,445,500, were sold in Denver last year; add to this approximately \$100,000 paid for second-hand cars and the revenue in this one particular industry goes beyond the million and a half mark.

Denver did not buy cheaply, the greater number sold being touring cars. Local pride says this indicates that Denver wants only the best.

BOOKS ON AUTOMOBILING.

Winged Wheels in France.

In a handsomely illustrated volume just published by G. P. Putnam's Sons, Michael Myers Shoemaker, tells of his run through the sunny land of France. The winged wheels were those of a 24-horsepower automobile, which confined itself to the modest speed of forty-five miles an hour, leaving faster progress to the 90-horsepower machines, which rushed past as though the author's car was standing still. Here are glimpses of stately old chateaus, some in ruins, some still inhabited, and made rich by tapestries which have hung there for centuries; information about roads and hotels; tempting bills of fare; sage warnings of discomforts to be shunned; types of national character; sketches of persons and events associated with the scenes described. The old walled town of Carcassonne was one of the traveler's few disappointments.

The descriptions are graphic, and there is a wise avoidance of the geographical details which often incumber books of travel, giving them the tone and aspect of guide books. The long tour was unmarred by any serious mishaps, although the number of French dogs was somewhat decreased. The book is illustrated by about sixty reproductions of photographs, and has a good index.

From the Rubber Tree to the Automobile.

"Rubber Tires and All About Them" is the title of a volume by Henry C. Pearson, editor of the *India Rubber World*, which deals with the rubber tire of every kind, and from every possible point of view. Beginning with the crude rubber in the South American forest, the material is followed through the various stages of manufacture until it emerges a complete tire. The theory, as well as the history of the pneumatic tire are gone into at length and present-day methods of construction are described. The book is profusely illustrated throughout, and as Mr. Pearson is an authority on the subject his work should be of value to those seeking tire information.

ITALY'S AUTO EXPOSITION AT TURIN.

U. S. Consul A. H. Michelson advises that the Automobile Club of Turin will inaugurate its fourth annual international automobile exposition in the newly enlarged Palazzo delle Belle Arti of the Valentino on February 16, 1907. Turin is Italy's greatest automobile center.

The exposition is under the patronage of the King of Italy, and will this year assume proportions not heretofore attained. Turin is the most important automobile center of Italy, and probably of Europe. It contains 21 of the 51 Italian companies engaged in the construction of automobiles, 6 of the 19 Italian automobile coach-builders, and 7 of the 30 Italian makers of automobile accessories; a total of 34 out of the 100 Italian companies that manufacture automobiles and their accessories. In the exposition of last year there were 102 exhibitors, only two of which showed American cars. Thirty thousand paying visitors saw the exposition.

It is most important that a good number of American makers be represented in an exposition held in such a center of the automobile trade as Turin. While for high-power touring cars American makers will find the competition of European firms exceedingly difficult to meet, this should not prove the case with cars lower in horsepower and price. The exhibiting of lightweight runabouts should prove especially worth while. So far the Italian makers have failed signally to realize the possibilities of good cars of this description on the Italian market. It can safely be said that American initiative which places runabouts and other lightweight cars upon the Italian market at a price not over \$1,000 will be attended with success. Cars of this description should have as long a wheelbase as possible, should be fitted, not with one, but with two or more cylinders, and should be driven by magnetic ignition.

LETTERS INTERESTING AND INSTRUCTIVE

MORE ABOUT TWO-CYCLE PISTON INLET VALVES.

Editor THE AUTOMOBILE:

[534.]—Having made innumerable experiments with the inlet valve in the piston—in fact, I have devoted nearly all my time to this type of motor—I wish to call your attention to an error in Mr. Malcolm's idea as published in your issue of the 27th. The position of the valve is exactly the reverse of what it should be, and it would be impossible to operate a motor with a valve in this position, as the first explosion would dislocate it, to say nothing of what the heat would do to the spring. I presume Mr. Malcolm got this idea from a description of one of my engines, sent by me under the name of Carter to C. E. Duryea, of the "Cycle and Automobile Trade Journal," for criticism about a year ago.

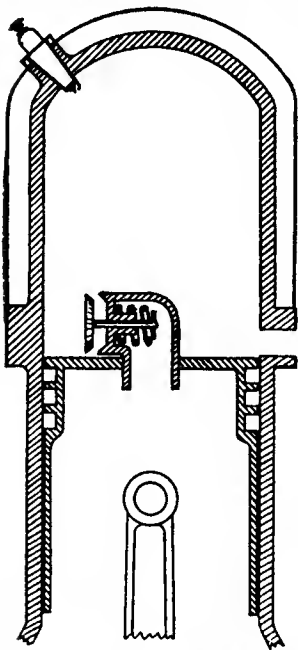


FIG. 1.—Sectional view of two-cycle engine with horizontal valve in piston suggested by C. E. Duryea about a year ago.

In my first engine I used the crankcase compression, but soon found this unsatisfactory in many ways, and turned my attention to other means of compression. Two methods appeared the most practical, namely, the separate compression cylinder and the double-ended power cylinder using the stuffing box end for compression. I chose the latter construction as it would, in my mind, make the most simple engine. This construction, of course, requires the use of a crosshead, but I think this preferable to the separate compressing cylinder, as it is much more compact, and will give a better balanced engine, a very important feature. The stuffing-box on this engine works under a light pressure, and is always cool and easily lubricated, and will run for months without attention or leaking. The crosshead can be made very light with ample wearing surface. Those used in my engine are made of steel, honeycombed and case-hardened. The adjustments for wear are made on the slides instead of on the crosshead, and as the strain is on one side of crosshead on the down stroke and on the opposite side on the up stroke, the wear is very even. I next turned my attention to producing a variable compression motor, as I found a high compression undesirable for slow speeds, while it gave the best results for high speeds, and vice versa.

Now the ideal condition is to have just enough compression to transfer the given amount of gas at each stroke at any speed, and this certainly cannot be accomplished with a fixed compression. To get this result I built my engine on the principle shown in Fig. 2. The piston A is closed at its lower end; an automatic poppet valve located at B opens into the hollow piston; the automatic valve at C opens into the combustion chamber K and F; the gas is admitted to the lower end of cylinder through the rotary valve D on the up stroke of piston; an automatic poppet valve operates very satisfactorily in place of the rotary valve and requires no gearing.

On the down stroke of the piston the gas is transferred through valve B into the piston chamber, the explosion of the previous charge holding valve C on its seat. Now it will be clearly seen that on each up stroke of the piston a charge of gas equal to the piston displacement minus that of the rod, which is slight, will be taken into the lower end of cylinder. On the down stroke this

entire charge of gas will enter the piston because the said piston comes within 1-16 to 1-32 of an inch of the lower end of cylinder. This charge, of course, having no effect whatever on the next, as the valve B closes the instant the piston starts on the up stroke, confining this gas in the piston. Consequently, on each down stroke a charge of gas, practically equal to the piston displacement, will be delivered to the piston regardless of the speed at which the engine is running when throttle is wide open. When the engine is running the action is as follows: As soon as the piston approaches the lower center, the ports EE are uncovered and the burned gases escape through these, as in an ordinary engine. As soon as the pressure in the cylinder falls below that in the piston the valve C is thrown open by the compressed gas in piston, which rushes into the cylinder, first clearing chamber K of burned gases, then rising in a column at the center of the cylinder.

The normal compression, or the compression on one down stroke of the piston, is about six pounds when throttle is wide open. This compression is sufficient to transfer the full charge at low speeds only. As soon as the engine is speeded up so fast that six pounds is not sufficient to transfer the full charge to the cylinder, the part not transferred will be left in the piston under a slight pressure, this pressure, as before stated, having no effect on the next charge.

Now, for convenience, we will suppose the amount of gas or pressure left in the piston to be one pound. On the next down stroke of the piston the normal amount of gas or pressure, six pounds, is forced into the piston in addition to the one pound left from the previous charge, making the compression seven pounds, instead of six. If this is still too low to transfer the full charge, a part of this charge (we will say one pound) in addition to the previous one pound, will be left in the piston, raising the compression to eight pounds on the next down stroke of the piston. This action will continue until a sufficiently high compression is reached to transfer a charge to the combustion chamber equal to that taken in at the lower end of cylinder when the engine is being brought from a low to high speed. When slowing up, a slight overcharge will be admitted at each stroke until the engine reaches a fixed speed.

It will be noticed that the shape of the piston makes the ideal deflector, keeping the incoming gas in a column at the center of the cylinder when running on a full charge. When throttled down low, all the fresh gas remains in the piston chamber K. With the spark plug at center of cylinder head, the spark always occurs in a body of fresh gas, allowing this engine to be throttled exceptionally slow without missing.

By passing the gas through the lower end of cylinder and also through the piston it is brought to a much higher temperature than usual before entering the cylinder, thereby producing a thoroughly vaporized mixture, and at the same time keeping the piston and lower part of cylinder fairly cool. The exhaust ports extend entirely around the cylinder, and with this practice it is possible to make them much narrower, and at the same time get a greater area than with the ordinary practice. The narrow ports, of course, add to the power stroke. Again, by having the ports entirely around the cylinder, the expansion of same is very even, having no tendency toward distortion, as in a two or three-port engine, where the exhaust highly heats one side, while the other side is kept fairly cool by the incoming gas.

In my engine I use a crosshead and connecting rod similar to one used in a steam engine. By using a crosshead to take the side thrust, it is possible to use a much shorter connecting rod than usual without any bad results. The unusually short connecting rod also gives a considerably longer time than usual between the opening and closing of the exhaust ports. An excellent feature of this engine is that the

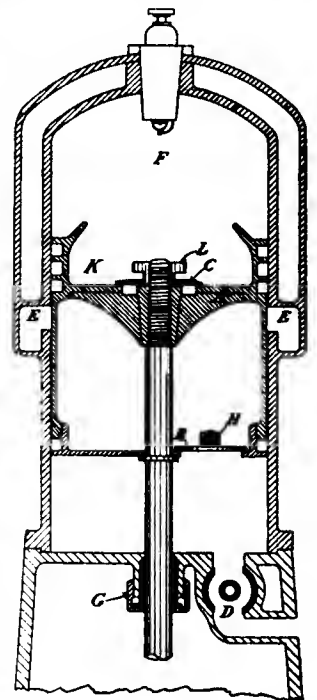


FIG. 2.—Sectional view of F. R. Wottring's two-cycle variable compression engine. This sketch is not drawn to scale.

charge is taken into the cylinder during the full up-stroke of the piston, allowing the use of any carbureter, this action being far superior to the short, quick rush of the three-port engine. The construction of this engine also admits of a perfect system of lubrication, which is by no means a small matter.

The crank bearings and pins, the slides and crosshead pin can all be liberally flooded with oil by the splash system without danger of flooding the cylinder. This oil also stays in a good condition, as it is not carbonized or burned in the cylinder. The cylinder can then be fed independently just the proper amount of oil to give the best results from a force or sight feed oiler.

Mr. Malcolm criticises the use of poppet or check valves in this motor. I would like to know if he considers the four-cycle engine a failure with its two and quite often three valves. Now, if a two-cycle engine will deliver two impulses to one of the four-cycle, and each one of them as good, or practically so, as the one, what would be the objection to the same number of valves in the two-cycle as in the four? In my engine only one valve is mechanically operated, and that is a rotary valve of the simplest form running at half the crankshaft speed. This valve works under a light pressure only, and at all times is cool, permitting of thorough lubrication, doing away with any danger of undue wear.

The valve B is simply a flat disk with a small, short stem, this valve being held in place by a light bridge H. It requires no spring, as the motion of the piston opens and closes it at exactly the right time. Valve C is a flat disk held in place by the nut L on an extension of the piston rod. The pressure of the gas in the piston opens this valve and the motion of the piston closes it. This fact that this engine will receive a slightly less charge of gas than the piston displacement, will cause some criticism, but the almost innumerable other good points more than make up for this one, by no means bad, feature.

The best three-port engine in the country will take in but very little over a charge of gas equal to one-half the piston displacement at high speed, while some take in less than this amount at slow speed, while at no time will any two or three-port engine take a charge of gas at every stroke, equal to the piston displacement.

L. R. WOTTRING.

Prospect, Ohio.

[**EDITOR'S NOTE.**—The error referred to by Mr. Wottring in the opening paragraph of his letter was one for which the draughtsman was entirely responsible, misplacing the valve in question in preparing the rough outline sketch, which was merely intended to illustrate the principle referred to in the accompanying text. We cannot say where Mr. Malcolm obtained his idea on the subject, but in presenting it he did so merely by way of review of proposed types of two-cycle engines, together with his views on their merits, and not by any means as an original conception of his own.]

POWER IN AIR- AND WATER-COOLED MOTORS.

Editor THE AUTOMOBILE:

[535.]—As a regular reader of your valued magazine, I write to ask if you will kindly give authoritative opinion and reasons therefor on the following statement: "A" affirms that with two motors of equal dimensions in every detail, same compression, etc., the motor with air-cooling system will develop more horsepower than the one water-cooled; for instance, the air-cooled motor will develop 30 horsepower, where the water-cooled motor can only develop 20 or 25 horsepower. "B" says such is not the case; that is, it is not yet practical.

S. BARRETT.

Carterst, N. J.

Theoretically speaking, of two motors alike in every detail of design and operation, the air-cooled motor should develop a greater amount of power than the water-cooled, but that the difference between the two would ever be so great as you mention is extremely doubtful. The reason for this is due to the fact that the efficiency of an internal combustion motor is measured by the number of calories or heat units in a given quantity of fuel that it converts into useful work. Generally speaking, water-cooling is over-efficient; it tends to keep the cylinder walls at a temperature below that at which the highest percentage of thermal efficiency is reached by the motor when in operation. There is naturally a limit to the temperature at which a motor can be run constantly under ordinary conditions, as the lubricant will vaporize or burn and the piston bind. The majority of makers prefer not to approach this danger line too closely; hence, the great heat losses in the water jacket. Air-cooling, on the other hand, may also be over-efficient, though this is not as likely

to be the case as with a water-cooled motor, and in consequence a greater percentage of the heat is apt to be utilized. But in the contention which your letter reveals, B is correct in stating that the construction of an air-cooled motor of the same compression and same mechanical details as a water-cooled motor of the same size has not been found practical. With the exception of motors of very small size, such as employed on the motor bicycle, it is not usual to design air-cooled motors with anything like the same degree of compression as is used in water-cooled motors of the same dimensions, owing to the extremely rapid rise of temperature with the compression. At first sight there appears to be no reason why this should not be done, but practice has shown otherwise. It is but one of the many instances in which theory and practice do not agree.

MORE ABOUT CRANKCASE BREATHERS.

Editor THE AUTOMOBILE:

[536.]—Permit me to correct a statement made by you in reply to letter from Wm. F. Long, in "The Automobile" of December 13, on the subject, "Use of Breathers on Crankcases." While expansion of air in crankcase, due to heat generated in running, as well as leaks of gas past the piston during compression and explosion periods are a proper *raison d'être* for breathers, your statement explaining other causes for unstable equilibrium are incorrect, as you will at once note. You state in answer to Mr. Long that "it is not a fact that downwardly moving pistons in a multi-cylinder engine exactly compensate for the upwardly moving ones—because the angularity of the connecting rod causes the pistons in upper half of strokes to move materially faster than in traversing the lower half." It is in this statement that you are wrong, which can be shown by more than one line of reasoning, as I will proceed to show.

1. Angular velocity of crank on the crank circle is same at all parts of a revolution for any given constant speed.

2. Piston travel (one way full stroke) is equal to diameter of crank circle.

3. Distance traveled (in one way full stroke) by piston is therefore equal to an angular motion of crank of 180 degrees, which is to express point 2 in other language.

4. The projection of that angle (180 degrees) upon the diameter. (Vertical diameter on a vertical engine and horizontal diameter on a horizontal engine.)

5. For any portion of the travel of crank and piston, therefore, the lineal measure of piston travel equals the projection of the crank circle arc of angular travel of crank upon the diameter of crank circle which coincides with center line of cylinder.

6. Projections at the top and bottom of strokes are therefore a minimum, and at middle of stroke are a maximum for any given angle of travel of crank on crank circle. This will be seen at a glance by projecting upon the vertical diameter (as explained above) the arc of angular travel of crankpin for the first and second—45 degrees of motion. This projection of first 45 degrees is less than one-half of the similar projection of the second 45 degrees. It would be easy to go into figures and prove this by trigonometry or to plot it and show it graphically, but it is hardly worth while.

For a more popular explanation it will be noticed that as piston changes its direction at end of each half stroke or cycle it must come to a stop and its velocity is therefore zero, whereas in middle of stroke its velocity is maximum. It is this very fact among others that makes all oscillating engines of steam and gas engine type of necessity slower speed motors than turbine and electric motors of rotary type. You were right in your idea that piston had a variable velocity, but wrong in your explanations and conclusions, for, as shown, the variation here is symmetrical and for all engines of even numbers of cylinders set 180 degrees apart the equilibrium is maintained, provided, of course, no two adjacent cylinders not 180 degrees apart are confined in a crankcase section, not connected so as to admit of free circulation or oscillation of the air confined.

This is all I sought to explain to readers of your extremely interesting and valuable paper. Still, we have to have the breathers for other reasons given by you.

J. FRANCIS BOOREAM.

Greenwich, Conn.

OHIO CITY WANTS FIRE APPARATUS.

Editor THE AUTOMOBILE:

[537.]—We are in the market for an automobile piece of fire apparatus, namely, a combination chemical engine and a hose wagon, machine to be arranged to carry one chemical tank, capacity 35 gallons, and 1,000 feet of fire hose. We would be pleased to hear from automobile builders as to what they have to offer.

Alliance, O.

WM. AUNGST, Chief, Fire Department.

FRANCE LEADS THE WORLD IN PROLONGED SPEED

In the three great long-distance road races of last year France captured all first place honors, but each time with a different driver. Szisz, with a Renault, won the Grand Prix; Duray, a Dietrich driver, succeeded in the Ardennes Circuit; and Wagner and his Darracq appropriated the Vanderbilt Cup. A feature of the 1906 racing was the use of dismountable rims, by which a saving of fifteen minutes was effected in changing tires. Owing to their widely differing lengths and road conditions, it is not possible to put the three international speed tests on a common basis. The Ardennes and Grand Prix circuits were about equally speedy, but the length of the former was only half that of the latter, and it is therefore not surprising that the highest average was obtained in Belgium. Compared with the two European courses the Long Island circuit left much to be desired for speed, yet its average is only slightly lower, as will be seen from the following table:

Ardennes Circuit: Duray; Dietrich; 372 miles, average 66 m.p.h.
Grand Prix: Szisz; Renault; 769 miles, average 63 m.p.h.
Vanderbilt Cup: Wagner; Darracq; 297 miles, average 61½ m.p.h.

The fastest rounds in each of the three contests were:

Grand Prix: Baras, Brasler, 74 miles per hour.
Ardennes Circuit: Wagner, Darracq, 70 miles per hour.
Vanderbilt: Tracy, Locomobile, 67.66 miles per hour.

Of world-famed drivers four competed in the three great road races, namely: Duray, Clement, Wagner and Jenatzy. Lancia did not run in the Ardennes, and Szisz confined himself to the

Grand Prix. Duray heads the list, comparing with his companions, as follows:

Duray—8, Grand Prix; 3, Vanderbilt; 1, Ardennes.
A. Clément—3, Grand Prix; 4, Vanderbilt; 6, Ardennes.
Jenatzy—10, Grand Prix; 5, Vanderbilt; 10, Ardennes.
Wagner—0, Grand Prix; 1, Vanderbilt; 8, Ardennes.
Lancia—5, Grand Prix; 2, Vanderbilt.
Szisz—1, Grand Prix.

Burton replaced Jenatzy in the latter half of Grand Prix; Wagner completed only two rounds.

The fastest short burst of speed in 1906—or in any year, for 1906 saw the breaking of all records—was given by an American-built machine, the Stanley steamer, driven by Fred Marriott. On the Ormond-Daytona beach he covered the mile on a flying start in :28 1-5, or at the terrific rate of 127.66 miles an hour. Although America occupies top position, France has a no less glorious record, and indeed over a two-mile stretch, with a flying start, left the American "Teakettle" behind, Demogeot with eighty-cylinder 200-horsepower Darracq clocking at :58 4-5, equal to 122.44 miles an hour, against his rival's :59 3-5, or 120.8 miles an hour. All the world's short-distance records, except the flying kilometer and flying mile, are held by the eight-cylinder Darracq monster, which, piloted by Hemery for the first time on the measured kilometer in the south of France at the end of 1905, then by Demogeot at the Florida meet, and latterly by the young English sportsman, A. Lee Guinness, has been everywhere victorious.

Distance.	Time.	Start.	Car.	Driver.	Place.	Rate of Speed.
1 mile	28 1-5 s.	Flying	Stanley steamer	Marriott	Florida	127.66
2 miles	58 4-5 s.	Flying	Darracq, 200-h.p.	Demogeot	Florida	122.44
2 miles	59 3-5 s.	Flying	Stanley steamer	Marriott	Florida	120.8
1 kil.	18 2-5 s.	Flying	Stanley steamer	Marriott	Florida	121.57
1 kil.	19 s.	Flying	Darracq, 200-h.p.	Guinness	Ostend	117.6
1 kil.	26 2-5 s.	Flying	Darracq, 80-h.p. light racer	Walker	Ostend	84.6
1 mile	45 2-5 s.	Standing	Darracq, 200-h.p.	Guinness	Ostend	79.2
100 miles	1:15:40 2-5		Napier	Earp	Florida	79.2
1 kil.	29 s.	Flying	Darracq, light	Demogeot	Gallion Hill	77.0
100 kil.	52:49		Darracq	Wagner	Ardennes Cir.	68.6
1 kil.	33 2-5 s.	Standing	Darracq, 200-h.p.	Guinness	Scheveningen	66.9
1 kil.	40 1-5 s.	Standing	Darracq, light	Walker	Scheveningen	55.6

GRAND PRIX RACE NOW CERTAIN:

PARIS, Jan. 10.—The fears of the Sporting Committee of the A. C. F. and of all French constructors interested in racing, have been allayed by the official announcement by M. Clemenceau, that permission for the holding of a long-distance road race will not be refused. Owing to semi-official reports that the government intended to put a ban on road racing, a deputation recently waited upon the Premier and asked for an official declaration. A circuit will now be selected, permission obtained from all the interested local authorities for the monopolizing of the roads, and a further request for authorization made to the head of the government—all a matter of formality. Proposed circuits are numerous, every district having a good set of roads doing its best to obtain the favor of the A. C. F. Fontainebleau circuit, near Paris, is the only one that has been officially examined, and is now found unsuitable. Auvergne and the Ardennes, both good racing grounds, are putting forth claims, but the financiers favor a course nearer Paris.

The first three entries for the Grand Prix have been made by the Bayard-Clément firm, the machines to be driven by Albert Clément, Pierre Garcet and Villemain. Three six-cylinder racers were built during the fall, two of them being now tried out on the road. It is very probable that these will be the machines selected for the Grand Prix. The Brasier firm, whose participation in road races next year was somewhat doubtful, has just announced that it will compete in all the principal events of 1907.

RECORD ENTRY FOR EMPEROR'S CUP.

PARIS, Jan. 8.—Seventy-four engagements have been received for the German Emperor's Cup, to be run on the Taunus circuit next June. This is the largest number of cars ever entered in a long-distance road race since the ill-starred Paris-Madrid test. Entrance fees for cars alone reach a grand total of \$55,500, and this will be further increased by the rental of tire and gasoline stations on the course. Of the seventy-four machines, 32 are German, 18 French, 12 Italian, 3 English, and the remainder Swiss and Belgian. Well-known drivers who will figure in the race include Lancia, Nazzaro and Weillschot for Fiat; Wagner, Hanriot and Demogeot for Darracq; Jenatzy for Mercedes, and Duray, Rougier and Gabriel for De Dietrich.

A certain number of important French constructors, amongst them Renault, Panhard, Braiser, Hotchkiss and Bayard-Clément, have withheld from the race on the ground that the regulation limiting cylinder volume was not such as would improve the construction of automobiles. The race will be run on a 52-mile course, thus it is certain that the first car will be round to the starting line while machines are waiting to start.

DEMOGEOT ENTERS THE MARRIED RANKS.

PARIS, Jan. 8.—Victor Demogeot, the Florida speed king, has just "buried his bachelor days"—as the French put it. The ceremony took place in the frontier town of Nancy, the bride being Mlle. Marie Cardot, a charming young lady of that city.



THE PATHFINDING "ALLIGATOR" ATTRACTED ATTENTION ALONG THE ROUTE. THIS PICTURE IN WINNSBORO, S. C., BEING TYPICAL.

FROM THE BIG TOWN TO ORMOND'S SANDS

WHEN Ralph Owen left Columbus Circle, New York, Sunday, Dec. 23, he predicted that he would pilot the Oldsmobile to the Ormond-Daytona beach in twenty days. As events turn out, he has had not only made good his prediction, but with the liberal margin of two days to spare. The Oldsmobile "Alligator," after making the run from St. Augustine to Ormond in the record-breaking time of four hours, despite the difficulties encountered, and after having duly accepted the hospitality of the eight carloads of enthusiasts who met the path-finding party where the road emerges from the almost impassable swamps to the beach, covered the eight miles to the clubhouse of the Florida East Coast Automobile Association, at Daytona, with things running better than the day of the departure from New York, arriving there Saturday afternoon.

Ever since the Oldsmobile party has crossed the border line between Georgia and Florida, its progress through the latter State has been more akin to a triumphal procession than a tour of exploration through a country not graced with anything that can be deservedly given the title of roads, except in short stretches.

The trip from the Georgia line to Jacksonville was characterized by a plunge through the Altamaha Swamps, during the passage of which the car was up to its hubs in mire and water for a large part of the time. The only washing that the car has received, or rather the most complete wash, for the entire trip has been but a succession of alternate mud and water baths, has been received in crossing the unusually deep fords in these southern streams.

Despite the deep sand and frightful holes caused by recent unusually heavy washouts which have undermined the roads in numerous places, a quick trip was made to Jacksonville, where the party was really treated to an ovation, due to the enthusiasm with which the southern press generally has greeted the idea of road improvement. Their coming was looked forward to and as soon as they arrived a self-appointed committee of prominent automobilists undertook to give them a reception as long as

they cared to stay. They were shown the sights of the town. The party finally left Jacksonville bound for St. Augustine to the strains of "Dixie," rendered by the local brass band assembled on the sidewalk in front of the hotel to do them honor and speed the parting guests with best wishes for the successful



IN A SOUTHERN GEORGIA COTTON FIELD.

outcome of the trip, for while the stretch from Jacksonville to Ormond was not at all feared, as the roads are fairly good throughout that section, it was thought that the comparatively short span from St. Augustine to Ormond would prove one of the worst parts of the trip, if not altogether insurmountable. The expectations of the party were not disappointed with regard to the good traveling to be found between Jacksonville and St. Augustine, and they rolled along at a good pace over the shell road that joins the two cities. On several occasions, however, it looked as if hours would be lost in getting around some of the heavy washouts that had occurred as the result of recent bad storms. Whenever one of these large crevasses in the road was met with there was no alternative but to look for an opening in the trees sufficiently wide to admit driving the car through in order to find a way around, or, if that was not possible, to attempt to strike some parallel road.

Upon arriving a few miles from the outskirts of St. Augustine, which does not cover a great deal of ground, the party was met by a reception committee, who had come out some distance in several cars to meet them. Not long after leaving St. Augustine, the party was met by a car which had come up to escort them on the last lap of the trip. Though the going was far from favorable, it was nothing like as bad as had been anticipated on this part of the journey. None of the southern States below the Virginia line can boast of much in the way of roads, but when it comes to traversing the Florida swamp country it is difficult to find anything to make comparison with.

It was with a great sigh of relief from every member of the party who had been battling with road difficulties, such as only those who have attempted to explore the backwoods country of the South are familiar with, that they suddenly came to a place where the miserable thicket road opened out onto the beach and their pleasure at making the discovery that this marked the end of their troubles. Eight carloads of enthusiasts were awaiting them at this point, and amid much cheering and congratulations the whole fleet of cars raced down the smooth beach toward the hotel at Ormond, where a stop was made for congratulations of a more substantial order. From this point only eight miles of as good running as ever an automobile was raced over lay between them and the finale of their long journey, and after the congratulations and "have another" had



PLOUGHING ITS WAY THROUGH A SOUTHERN GEORGIA SWAMP.

come to an end, they were given three rousing cheers to speed them on the last few minutes' run to Daytona.

The total time consumed in making the trip was twenty days, of which two days were spent in celebrating Christmas, the car being left at Harrisburg, Pa., in the meantime, so that the running time was but eighteen days, or two days less than Mr. Owen predicted was necessary to make the trip.



THERE WERE STRETCHES OF PICTURESQUE ROAD, SOMEWHAT SANDY BUT FAIR GOING, IN SOUTH CAROLINA.

A RUN IN SUNNY SOUTHLAND.

CHARLESTON, S. C., Jan. 12.—They were twelve—cool, clean and respectable looking—when they lined up at the Commercial Club, in Charleston, at 10:38 o'clock on the morning of December 29. Three hours and ten minutes later they were eleven warm-blooded pulsating little machines, strong and vigorous under their layer of brown mud, outside the Pine Forest Inn at Summerville. It was new to most of the people who took part in this first demonstration in force that was ever made on the "dirt" roads of South Carolina—in "these diggin's," as a local newspaper expressed it, reporting the run. Some of the party sat still and held on; one man lay down and established a close acquaintance with gentle mother earth while vainly endeavoring to repair a chain and broken springs, which gave out on one of the rough parts of the road. All had experiences of a more or less exciting nature, and everybody got back home by early candle lighting, as the saying used to be in the up-country before the strenuous age began.

The route chosen was a picturesque one. Leaving Charleston the way lay across the Ashley River and along the Ashley River road, passing the well-known Magnolia Gardens, Drayton Hall and many other plantations that in days gone by were famed for their beauty and the liberal hospitality of their owners. The route was divided into ten controls, and Morton B. Paine,



IN FRONT OF PINE FOREST INN, SUMMERVILLE.

One of the results of the tour will be the inauguration of a movement for the construction of a fine boulevard from Charleston to Summerville. Pine Forest Inn is one of the noted Southern resorts and ought to be easy of access by automobile. If it can be made so by the Charleston's automobilists it will be.

The cars participating in the run and their drivers were as follows: Official car, 20-horsepower Reo, M. B. Paine, Jr., tour manager; driver, N. H. Blicht; 20-horsepower Premier, F. G. Davies; 20-horsepower Reo, T. B. Jenkins; 20-horsepower Reo, C. M. Gibson; 20-horsepower Reo, E. A. Jenkins; 20-horsepower Reo, J. E. Richards; 20-horsepower Cadillac, Eugene W. Smith; 8-horsepower Reo, N. H. Blicht, Jr.; 8-horsepower Reo, M. B. Blicht; 8-horsepower Reo, H. E. Richard; 8-horsepower Reo, J. W. Martens; 8-horsepower Reo, J. R. Barker; 10-horsepower Cadillac, J. H. Rast.

THE COMING ORMOND-DAYTONA MEET.

When the list was closed at 3 o'clock on Monday last for the races to be held on the Florida sands next week, it became known that more than 100 entries were assured for the meet. Prominent among the high-powered racing cars nominated are the 100-horsepower Darracq to be driven by Wagner; S. B. Stevens' 80-horsepower car of the same make; J. R. Harding's 90-horsepower Mercedes; H. W. Harroun's eight-cylinder 500-pound Harroun; Fred Marriott's 30-horsepower Stanley steamer, and H. E. Rogers' long distance Stanley. The stock events have attracted a great many more entries than were expected, the Stevens-Duryea, Winton, Peerless, American, Wayne, Welch, Elmore, and Stanley steamers being well represented. The manner in which steam has carried everything before it at the kilometer and mile being so well-known, the outcome of the entry of a steamer for the long distances is looked to with considerable interest.



LOVELY RIDGEWOOD AVENUE IN PICTURESQUE DAYTONA.



THE STOP AT THE FIRST CONTROL NEAR CHARLESTON.

Jr., who headed the line in his 20-horsepower Reo official car, distributed the confetti which identified the way. In several places along the route there were stretches of water covering the roadway, four to six inches deep, which in turn would be succeeded by hills, the worst one of which was encountered just before reaching Middleton's Gardens, 17 1-2 miles from Charleston. This hill has a rise of 72 feet in 300, and was a wet, slippery mass of clay. When the pineland was reached a few miles out from Summerville road conditions improved.

At the Pine Forest Inn, Summerville, a delightful dinner was served to the hungry tourists by the host, Captain F. W. Wagener. Plans were discussed among the participating autoists for the formation of the Charleston Automobile Club—the consummation of which is a matter of the near future—and with true Southern spirit, J. H. Rast, who drove a 10-horsepower Cadillac, and E. A. Jenkins, who piloted an 8-horsepower Reo, agreed to test out respective merits of their cars by a race on the homeward bound trip. The official car and two others left in advance of the rest to reach Charleston in time to judge the race at the finish. It was an exciting run, and the participants only slowed down when humanity demanded it, but they slackened not when the slush reached their axles, and when curves were met they took them as Hemery showed us how. The Cadillac got in first, but the Reo was only ten seconds behind. After the racers came the remainder of the party, and every car was accounted for shortly after dark.

THREE BILLS ALREADY AT ALBANY.

ALBANY, N. Y., Jan. 14.—There is a very evident attempt to get next to motor vehicle legislation by a number of statesmen of the lower branch of the Legislature. Assemblyman Cuvillier, of New York, has a bill to license all owners, lessees, and operators of automobiles or motor vehicles not propelled by horse power and allowed on public streets and roads, except railroads. The license fee is \$25. The bill also provides for chauffeurs of twenty-one years or over who shall pass an examination before getting a license to run a car. If anyone after getting a license shall run over anyone and kill or injure the same he shall have his license revoked and be guilty of a misdemeanor and subject to a year's imprisonment and a \$500 fine, or one or the other.

Assemblyman Northrup, of Dutchess, has an amendment to the present motor vehicle law of 1904 which provides that no person shall operate a motor vehicle on the public highways that is geared to run more than one mile in four minutes. The same bill provides for requiring the age of a chauffeur to be stated in the statement he or she makes when getting a badge from the Secretary of State, and provides that a chauffeur must be sixteen years old or more.

Assemblyman Stanley, of New York, introduces again that old bill of his of last year, which provides for a State commission of three and an expensive counsel and a big office staff, and power to regulate automobile affairs. The bill was opposed last year by the New York State Automobile Association.

AN AUTO BILL BY THE MISSOURI MEMBER.

WASHINGTON, D. C., Jan. 14.—Automobile manufacturers and those allied with the motor car industry will be affected by the enactment of a bill introduced in Congress by Representative DeArmond, of Missouri. The object of the bill is to provide for the marking of rates of tariff duty upon manufactured articles and to fix the punishment for the violation of the provisions thereof. The bill provides in effect that upon each and every article of domestic manufacture upon which, if of foreign production and imported into the United States, there would be levied a tariff or customs duty of 30 per centum or more, or a duty amounting to 30 per centum or more of the dutiable value thereof, there shall, before the same is taken from the place of manufacture, be marked, plainly and as indelibly as may be practicable, the rate of duty imposed by the law upon the like article when imported. Whoever shall sell or dispose of any such article not so marked or shall, prior to acquiring it for use by himself, family, or employees, remove, destroy or obliterate any such mark or marking, shall be guilty of a misdemeanor, and for each offense shall be punished by a fine of not more than \$5,000 or by imprisonment for not more than one year, or by both such fine and imprisonment; and all such articles not marked as aforesaid shall be forfeited to the United States.

This bill has been referred to the House Committee on Ways and Means. Its enactment into law would make it obligatory upon every automobile manufacturer to stamp his car the rate of duty now imposed upon foreign cars, 45 per centum ad valorem. It is hardly believed that the DeArmond bill will be taken seriously by Congress.

WASHINGTON STATE AFTER GOOD ROADS.

SEATTLE, WASH., Jan. 12.—In its general features the New York law for the building of roads has been adopted by the legislative committee of the Washington Good Roads Association. This law contemplates the distribution of the cost of building roads by the State paying 50 per cent., the county 35 and the local improvement district 15. The maintenance will be assumed by the State. It is estimated that there will be available in the road fund for 1907 the sum of \$132,000 and \$148,000 the following year. If the legislature passes the bill this winter it means that half a million dollars will be expended on roads in this State in the near future.

THE AUTOMOBILE CALENDAR.

AMERICAN.

Shows.

- Jan. 19-26.....—Baltimore, (Md.) Automobile Show of the Automobile Club of Maryland and Dealers' Association.
- Jan. 21-28.....—Los Angeles, Cal., Morley's Rink, First Automobile Show of the Automobile Dealers' Association of Southern California.
- Jan. 28-Feb. 2...—Washington (D. C.) Automobile Show, Dupont Garage, Washington Automobile Dealers' Association.
- Feb. 2-9.....—Chicago Automobile Show, Coliseum and First Regiment Armory. S. A. Miles, manager, 7 E. 42d Street, New York City.
- Feb. 11-16.....—Detroit, Mich., Sixth Annual Automobile Show, Light Guard Armory, Tri-State Automobile and Sporting Goods Association. E. E. McMasters, manager.
- Feb. 18-23.....—Fifth Annual Automobile Show, Buffalo, Convention Hall. D. H. Lewis, manager, Teck Building.
- Feb. 25-Mar. 2...—Portland, Me., Second Annual Automobile and Power Boat Show, The Auditorium.
- March 2-9.....—Chicago, Second Annual Power Boat Show, Seventh Regiment Armory. W. C. Andrews, manager, 19 E. Huron street.
- March 4-10.....—Kansas City, Mo., First Annual Automobile Show, Convention Hall. Frank L. Woodward, manager, Willis Wood Theatre Building.
- March 18-23.....—Providence (R. I.) Automobile and Power Boat Show, Infantry Hall. F. M. Prescott, manager.
- April 6-13.....—Montreal, Canada, Second International Automobile and Sportsman's Exhibition. R. M. Jaffray, manager, 309 W. Notre Dame street.
- April 8-13.....—Pittsburg, Pa., First Annual Show of the Pittsburg Automobile Dealers' Association, Duquesne Garden.

Race Meets, Hill Climbs, etc.

- Jan. 22-26.....—Ormond-Daytona (Florida) International Race Meet, Florida East Coast Automobile Association.

Motor Boat Races.

- Jan. 29-Feb. 1...—Palm Beach, Fla., Annual Races of the Palm Beach Power Boat Association.
- June 8.....—670-Mile Ocean Motor Boat Race, New York to Bermuda. Motor Boat Club of America and Royal Bermuda Yacht Club.
- Sept. 2-6.....—Jamestown (Va.) Exposition, Motor Boat Races.

FOREIGN.

Shows.

- Jan. 18-26.....—Birmingham (Eng.) Automobile Show.
- Jan. 25-Feb. 2...—Liverpool Motor Show, Tournament Hall.
- March 7-16.....—London, Olympia Commercial Vehicle and Motor Boat Show.
- April 6-13.....—London, Agricultural Hall Motor Show.
- May 1-15.....—Madrid, Spain, Automobile Exhibition, Palace of Fine Arts, Royal Automobile Club of Madrid.
- May 15-28.....—Third Annual Swiss Automobile and Cycle Show, Zurich.

Race Meets, Hill Climbs, etc.

- Feb. 23-27.....—Volturette Contest, Automobile Club of Italy.
- March 20-27.....—Nice (France) Automobile Week.
- April 1-15.....—Spring Wheel Competition.
- April 21.....—Targa Florio Tour (Slilly), Auto Club of Milan.
- April 25-28.....—Touring Contest, Automobile Club of Touraine.
- April 28.....—Chateau Thierry Hill Climb.
- May 1-15.....—Paris-Madrid Touring Competition.
- May 24-27.....—Volturette Contest, Automobile Club of Austria.
- May 29-June 1...—Irish Automobile Club Reliability Trials.
- June 3-12.....—Herkomer Cup, Automobile Club of Bavaria.
- June 14.....—German Emperor's Cup, Taunus Circuit, Imperial Automobile Club.
- June 24-29.....—Scottish Reliability Trial, Scottish Automobile Club.
- June 25-July 8...—Grand Prix, Automobile Club of France. (Exact date to be decided upon.)
- Aug. 11-20.....—Coupe d'Auvergne, France.
- Aug. 18-22.....—Ardennes Circuit (Belgium) and Coupe de Liedekerke.

WINTER DOINGS IN AUTOMOBILE CLUBDOM

President Caverly, of Washington Club, Energetic.

WASHINGTON, D. C., Jan. 14.—Robert B. Caverly, the newly-elected president of the Automobile Club of Washington, is losing no time in getting "on the job." In a circular letter to the members of the club he says, among other things: "It will be my pleasure to carry out the constitution and by-laws as adopted and to the best of my ability increase the pleasures and privileges of the members in the objects for which the club was originally organized. It will be impossible for any large amount of success to ensue without the hearty co-operation of every member, and to this end I avail myself of this opportunity to request each member to advise me fully as to his ideas on the following subjects: Please give me your suggestions looking to a series of entertainments that will interest the membership during the winter and early spring months. How do you stand on the question of stated tours during the early summer and fall? Are you in favor of club runs extending to distances that require more than one day to go and return? It is my intention to interest all our members in the ease with which runs for several hundred miles through the valleys of Virginia and Maryland can be attended without risk of failure and with the consequent great pleasure to be derived, as I can attest from an extended experience. The pleasure of automobiling, while it has grown enormously in Washington, is as yet nothing to what it will be in the next few years, and membership in this club will be highly sought with each succeeding year."

President Caverly is to be congratulated on the steps he has taken to awaken interest in the club, and it is evident that during his administration the Automobile Club of Washington is going to take rank with the leading clubs of the country.

A. C. C. of N. J. Wants All Vehicles to Carry Lights.

NEWARK, N. J., Jan. 14.—The Associated Automobile Clubs of New Jersey, at its recent meeting, held at Trenton, appointed a committee to draft a bill to be introduced at the present session of the New Jersey Legislature compelling all vehicles, horse-drawn or motor-driven, to carry lights at night. This committee consists of Frederick R. Pratt, the president of the State body; J. H. Wood, president of the New Jersey Automobile and Motor Club, and George A. Post, president of the North Jersey Automobile Club. It is the intention of the State body to revive an old law upon the statute books defining the rules of the road and the rights of all users of the public highways. The new Legislative Committee of the State association will be announced in the near future.

Quaker City Ladies to Have a Club.

PHILADELPHIA, Jan. 14.—The Ladies' Quaker City Motor Club, composed for the most part of the wives, sisters, cousins and aunts of members of the Quaker City Motor Club, has been organized. At the Hotel Majestic last Tuesday a temporary organization was effected by the election of Mrs. Joseph J. Martin as president, Mrs. Charles J. Swain as vice-president and Mrs. Edward B. Fincke as secretary. Over a score of fair Quakeresses have already signed the membership roll, and the recruiting committee is working with such a will that when the club meets for permanent organization a fortnight hence it is believed that the total will exceed the half hundred mark.

The charter members include Mrs. Joseph D. Bucher, Mrs. Robert A. Pitts, Mrs. Thomas E. Cookman, Jr., Mrs. Harry F. Cook, Mrs. William H. Noblitt, Mrs. Frank M. Chandler, Mrs. William Laycock, Mrs. William Ingram, Mrs. James M. McCartney and Miss Ida Benezet.

The Quaker City Motor Club is arranging for a monster hill climb, to be held on Memorial Day over a course in the neighborhood of Chestnut Hill.

Furnishings for New Chicago A. C. Clubhouse Chosen.

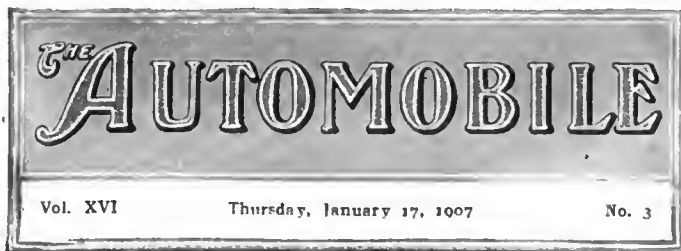
CHICAGO, Jan. 14.—Progress on the new home of the Chicago Automobile Club has not been as rapid as many of the members would like to have it, and in order that, once the building itself is up, no further delay shall be encountered in making the interior ready for the grand housewarming with which the new quarters will be thrown open, President Ira M. Cobe has been planning a surprise for the members. He has been devoting considerable time to hastening the work on the big building that is going up at 13-15 Plymouth court, and has just issued an official prospectus showing how the interior of the clubhouse will look when it is finally ready.

Starting with the basement Mr. Cobe has selected for the grillroom furniture of Mission style finished in green oak. The walls will be cement, marked off in squares to imitate stone, being set off at the top with a wide frieze depicting various colonial scenes, the subjects of most of which, it is expected, will be drawn from the history of the early days of Chicago. The bowling alleys will also be on this floor and will be of the most modern type in everything that concerns their construction and equipment. The color scheme in the latter will harmonize with that of the grillroom. On the second floor there will be a lounging room furnished with large arm chairs finished in old Spanish leather. At each end of the room there will be a large fireplace, the color scheme of the room itself being in green of two shades. On the same floor there will also be the ladies' parlor, furnished with furniture of the style of Louis XV., which will be brought from abroad. This room will be decorated in paneling of the same style, the color scheme being in French gray. The floor above will house the main cafe, which will be finished in paneling, the color scheme also being French gray and Pompeian red, while two entire floors will be devoted to sleeping apartments, which will be furnished with brass beds and mahogany furniture throughout.

Bay State A. A. Elects Officers, and State Organization Meets.

BOSTON, Jan. 4.—Pronounced interest characterized the largely attended annual meeting of the Bay State Automobile Association at the clubhouse on Dartmouth street January 7. Reports presented by officers and committees showed that the association is in excellent shape financially and socially. President Lewis R. Spere in his report reviewed the work of the year. Secretary James Fortescue reported that the association now has 700 members and is in a prosperous condition. With the increase in dues, which goes into effect this year, it is expected that the treasury will be enriched by several thousand dollars annually. In the election of officers very few changes were made. President Spere, Vice-president Harlan W. Whipple and Secretary Fortescue were reelected. Harry Knights was chosen treasurer in place of Herbert L. Bowden. The new board of directors is as follows: Charles E. Fay, of the Ford Company; J. C. Kerrison, Arthur Hinchcliffe, of the Winton branch; A. P. Underhill, of the Reed-Underhill Company, and George W. McNear, of Quinsler & Company.

Before the Bay State meeting there was a meeting of the Massachusetts Automobile Association, attended by President Elliot C. Lee, of the Massachusetts Automobile Club; President L. R. Spere, of the Bay State A. A.; President J. P. Coughlin, of the Worcester Automobile Club; President Haynes, of the Springfield Automobile Club; Charles Leonard, of the Leominster Automobile Club, and Treasurer J. C. Kerrison. The proposed legislation in Massachusetts was discussed and plans were also considered for the conduct of the association under the new rules of the A. A. A.



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The Greatest American Automobile Show. Seven years of automobile shows, each one so much better than the last, both in point of the achievements exhibited as well as the manner in which they have been staged, have led New York and the automobile industry as a whole, which sends its representatives by the thousands to attend the metropolitan event, to expect a great deal. Seldom has expectation been more completely fulfilled. The history of the past seven years of automobile show-holding has been so frequently reviewed of late that it would be superfluous to attempt to recount it here, but the paucity of material available as well as the crudeness of its surroundings, as installed in the first event of the kind, may well be recalled at the moment when the magnificent spectacle presented by the Garden during the current week is holding the attention of the automobile world, which is daily embracing a greater and greater proportion of the general public.

Planned almost a year in advance, the matter of providing an appropriate setting that should surpass anything of the kind hitherto attempted—a task involving a vast amount of labor and a large expenditure—has been so carefully carried out that not a detail was lacking to mar the completeness of the picture when the doors were thrown open Saturday night. Never has the automobile appeared to better advantage. The show as it stands is a fitting culmination of seven years of persistent effort, which will be found difficult to surpass on future occasions, regardless of the amount of time or money that may be devoted to the work of converting the bare walls and ceiling of the building that houses it into a scene, every detail of which becomes blended in the complete ensemble.

As for the cars themselves, it would be difficult to add to what has already been said many times over regarding the advanced stage of construction and design that they represent. American builders were slow in grasping the essentials of design as established by their forerunners abroad, and for a long time were unwilling to admit superiority when they saw it; but, once the period of indecision was past, progress came so fast that the original handicap was soon made up and the mark set by it left far to the rear. Nothing exemplifies this better than the present show, in which the flower of automobiledom, as represented by the chief makers on either side of the Atlantic, are ranged side by side. Time was when "imported" stuck out all over the foreign production, and it was akin to crossing a frontier merely to go from the stand of a home builder to that of one of his competitors from across the pond. How completely the distinction has disappeared could hardly be better evidenced than by the frequency with which the exhibitors' signs and the nameplates on the cars themselves are called upon to identify their country of origin. Dollar for dollar, there is nothing superior to the American car in whatever light it may be considered, and, after all, that is the crucial test of worth.



Present Status of the Two-Cycle Principle. Compared to the number of years that were required to develop some of the best known inventions in other lines of industry, the amount of time that has been devoted to a practical study of the problem presented by the evolution of the two-cycle principle of the internal combustion motor is but a mere bagatelle. Yet there are critics who point to the fact that during the seven or eight years in which the two-cycle motor has been a factor in the automobile industry, but one firm has had the courage of its convictions. That but one builder has consistently adhered to this principle in building automobile motors is a matter of common knowledge, but that this is to be considered as being conclusive proof of its unfitness for the purpose in question would be absurd. Had it not been for the dogged persistency of some inventors in adhering steadfastly to their ideals in the face of ridicule, the advent of numerous time and labor-saving inventions might have been postponed indefinitely. Daimler himself was regarded as a harmless lunatic for attempting to combine a gas engine and a carriage, but it is safe to say that had he not persisted the automobile would not have been so far advanced.

Between those extremes of optimism that predict the final arrival of the two-cycle motor at a stage where it will have swept all before it, and that of the reverse, which considers the time and money spent on the further development of the principle as utterly wasted, there is a sane medium which is representative of some of the best talent in the industry. Both the possibilities, which are great, and the difficulties, none of which are insurmountable, are recognized, and that the former will, in time, be realized to a far greater extent than they are at present is a foregone conclusion. That the two-cycle motor in its present stage of development, as represented by the power plant of the cars turned out by the firm specializing on this principle, is an efficient and practical machine will not be denied by anyone who is familiar with its capabilities, not to omit its long record of extremely creditable performances under conditions calculated to test the merits of any piece of machinery beyond the breaking point. That it has been able, not alone to survive these, but to come out of them in a manner not less creditable than was displayed by others of the standard type, is indicative of the promise its further development holds out. Whether, in the end, the principle will be proved to represent the only path to that extreme of simplicity, combined with a high degree of efficiency that is the aim of every designer, is something that cannot be predicted. Suffice it to say, its past shows what can be done, and if more initiative were taken there is little doubt that its position in the automobile world would be more rapidly advanced. It is with this in view that we have encouraged a statement of opinion on the subject.

THE MUNCHAUSENS OF AUTO PUBLICITY.

Little Hungary, a well-known Bohemian resort in East Hous-ton street, Tuesday night held a noted assemblage of disciples of Munchausen, whose tales were the wonder of his time. The publicity experts of automobiling sometimes travel faster than the cars whose deeds they exploit, and for purposes of mutual offense and defense they organized under the somewhat startling title of "To H—l with Booming Anybody Society, Limited." "Confidentially," states Duncan Curry, "they told each other what they thought of the automobile game in general and each other in particular."

These were the notables gathered round the festive board: E. Ralph Estep, Packard; F. L. Faurote, Oldsmobile; R. H. Johnston, White; H. T. Clinton, A. L. A. M.; Charles W. Mears, Winton; Leroy Pelletier, Ford; George Bolles, Royal; H. W. Grant, Maxwell; J. A. Kingman, Locomobile; T. F. Moore, Wyckoff, Church & Partridge; W. L. French, Matheson; Charles Culver, Knox; R. L. Dunn, Pope; George T. Davis, Thomas; J. W. Drown, Corbin; C. H. Rockwell, Autocar; A. B. Tucker, a wholesaler; F. Ed. Spooner, another wholesaler; C. H. Huntington, Columbus; Alex. Schwalbach, Brasier; Jack Hitchcock, of Philadelphia; Joe Ryan, of Chicago. Of course, Press Agent Arthur N. Jervis, of the Garden Show, was a prominent figure, and Alfred Reeves, general manager of the A. M. C. M. A., attended the function, of which "Billy" Young served as bouncer, though his services were not called into play.

A. C. A. PRESIDENTS JOIN THE "FINEST."

Entitled to be equipped with a billy, a regulation six-shooter, and a badge issued by the Municipal Police Department, five members of the Automobile Club of America will henceforth have the weight of law and authority on their side, and will make it their business to arrest for overspeeding and reckless driving wherever they see it. They are President Colgate Hoyt and ex-presidents Winthrop E. Scarritt, George F. Chamberlin, David Hennen Morris, and Alfred R. Shattuck. Messrs. Hoyt and Scarritt have already had their applications acted upon favorably by Commissioner Bingham and have been duly enrolled as special policemen of the city of New York, Nos. 27 and 347 respectively.

When approached on the subject, the Police Commissioner was of the opinion that the newly added members to the special "force" would not be compelled to wear uniforms, but they will have to call at Police Headquarters once a month and sign the roll blotter, and in case of riot or emergency they are apt to be called upon at any time to do police duty. This is interesting in view of the fact that it is not a felony to assault a special policeman, though such is the case where a regular guardian of the peace is concerned. If necessary to aid in the prosecution of offenders and aid the police in general in this matter, the club will furnish the services of a lawyer. The A. C. A. intends to do its part in ridding the metropolis of the scorching drivers.

EUROPEAN INVASION TAKES SHAPE.

Preliminary arrangement for the invasion of Europe next June and July, as planned by George Dupuy, were discussed at a meeting at the New York Motor Club, Tuesday. The "invasion" is to consist of a 4,000-mile tour in France, Italy, and other countries by fifty or sixty American automobiles. An American Gold Cup for the trip will be donated by W. K. Vanderbilt, Jr., E. R. Thomas of Buffalo, Jefferson deMont Thompson, and other automobile sportsmen. Several important manufacturers have expressed their approval of the tour, and E. R. Thomas, of Buffalo, and W. J. P. Moore, of New York, have signified their intention of entering cars. An organizing committee has been appointed, consisting of E. R. Thomas, chairman, George N. Pierce, A. L. Riker, J. D. Thompson, H. A. Lozier, E. S. Partridge and W. J. P. Moore.

BRUSH RUNABOUT CO., OF DETROIT.

DETROIT, MICH., Jan. 14.—Detroit's ever-thriving automobile industry has given birth to another member of the rapidly-increasing family, in the Brush Runabout Company. This firm, which was recently incorporated in New Jersey, with \$200,000 capital, will shortly commence operations in this city. The concern has purchased the control of the Eclipse Manufacturing Company, of Fort street east, which will be converted into a foundry where engines will be manufactured, the other parts and assembling to be done at the Briscoe Manufacturing Company.

As the name of the company implies, attention will be paid to the construction of runabouts only. The new factory, encouraged by the success and popularity the \$500 Ford runabout has attained, will enter a competitive field and plans to put a run-about on the market at as low a price as has the Ford. Distinctive features from the Ford type will be a single cylinder vertical engine and solid tires. A. P. Brush, who is connected with the firm and who will be designer, will be remembered as the man who made the Cadillac single cylinder famous.

A number of well-known local and eastern capitalists are behind the project, which should assure ultimate success. The officers of the company are: President, George B. Yerkes; vice-president, F. A. Harris; secretary, Emil D. Moessner; treasurer, A. C. Miller.

Though the new car has been shown in private to those directly interested, it will not be put on public exhibition until the Detroit automobile show. The general design of the engine, the lightness of reciprocating parts, combined with its relation to the spring suspension, renders the vibration almost unnoticeable, and the noise is reduced to a minimum. By moving the hood all vital organs of the car are uncovered. The cars will be ready for delivery about April 1, and will be shipped at the rate of fifteen a day till the season's run of 2,500 is delivered. Six thousand is the figure for 1908, after which date 10,000 cars will be turned out yearly.

PERCY OWEN TAKES ON A FOREIGN LINE.

Percy Owen, for many years identified with the selling end of the Winton interests, and for the past year or so eastern sales manager of the Aerocar Company, has just severed his connection with the latter concern to undertake the general sales agency in this country of the Bianchi car. The latter is an Italian production, designed on lines made familiar by the Mercedes and Fiat cars, and is built by one of the largest concerns in the Peninsula. Three chassis, of 30, 40 and 70 horsepower respectively, are listed. A New York branch has just been opened at Seventy-first street and Broadway, and Mr. Owen expects to sail for Italy before the end of the month to hasten deliveries. The company is building three high-powered racing machines.

GEORGE H. DAY GOES SOUTH TO REST.

Owing to the long-continued strain he has been laboring under in attending to the executive work in connection with this week's show, George H. Day, general manager of the Association of Licensed Automobile Manufacturers, has been ordered South by his physician to rest. The latter considered that he was in danger of physical breakdown several days before the opening of the show, but Mr. Day insisted upon remaining long enough to get at least a glimpse of the fulfillment of the task that he had been so largely instrumental in carrying out. He left after attending a meeting of the executive committee Monday afternoon.

AUTOMOBILE TIRE COMPANY OF TRENTON, N. J.

A newcomer to the tire field is the Automobile Tire Company, of Trenton, N. J., in which several well-known automobile manufacturers are said to be interested. C. H. Semple has accepted the presidency of the new company, having resigned as general sales manager and secretary of the G & J Tire Company, of Indianapolis, Ind.

QUICK SETTLEMENT ON A. C. A. SHOW.

The seventh annual Automobile Show of the Automobile Club of America, participated in by the members of the American Motor Car Manufacturers' Association and the Motor and Accessory Manufacturers, and also open to other automobile manufacturers, closed its doors but a month ago. A financial statement has just been published showing a net profit of \$52,000. In accordance with the profit-sharing policy of the exhibition committee of the A. C. A., one-half of the net proceeds of the show, amounting to 45 1-2 per cent. on the amount of space rental paid, will be refunded to exhibitors. Members of the A. M. C. M. A. also benefit by the preliminary association rate of 20 per cent. below the regular figure, making a return of 65 per cent. on price paid for space. This is said to be a larger refund than has ever been made to exhibitors in any automobile show held in America.

MINNEAPOLIS SHOW, MARCH 2 TO 9.

MINNEAPOLIS, MINN., Jan. 14.—The Minneapolis Automobile Dealers' Association has secured the new First Regiment Armory for the first automobile show ever held in the Northwest. The show will take place during the week of March 2-9, under the managership of an expert from the East, and will be the most pretentious ever held west of Chicago. The Western Passenger Association has granted a railroad rate of a fare and one-fifth, for the entire Northwest country. The sum of \$3,000 has been pledged by the Minneapolis dealers who are behind the show, and \$5,000 will be subscribed if necessary for the work of organizing the big exhibition. Negotiations are on with an Eastern show manager, to take entire charge, and no effort will be spared to make it an unqualified success. The Armory has but recently been completed, and the exhibition will be one of the first public functions to be held in it.

BUFFALO'S SHOW IN CONVENTION HALL.

BUFFALO, N. Y., Jan. 14.—Arrangements have been completed for the automobile show to be given this year under the auspices of the Automobile Club of Buffalo and the Buffalo Automobile Trade Association. Space allotments were made last Thursday. Secretary D. H. Lewis had much difficulty in obtaining Convention Hall, but finally secured the place for the week of February 18-23. The electrical display will be one of the features of the show. One piece alone will contain 1,000 lights.

At the recent annual meeting and banquet of the Buffalo Automobile Trade Association the following officers were elected: President, J. A. Cramer; vice-president, W. C. Jaynes; secretary, D. H. Lewis; treasurer, J. J. Gibson; executive committee, E. C. Bull, J. B. Eccleston, and G. H. Popenberg.

COAST AUTO SHOW IS PLANNED.

San Francisco will hold its first automobile show the latter part of February in the new skating rink near the Golden Gate Park, a building having more than seventy thousand square feet of show space. The proposition to hold a show met with instant favor among local dealers, more than thirty being present at the first meeting. Arrangements are being perfected rapidly by the dealers, assisted by the Automobile Club of California. The following officers have been elected: President, J. W. Leavitt; secretary, Herbert Choynski; manager, Max Rosenfeld.

IMPORTERS HOLD A RIVAL SHOW.

In a cleaned-out Fifth avenue picture gallery several importers are holding their "show" concurrently with the one in Madison Square Garden. The exhibit consists of a Renault runabout and a Renault touring machine, both last year's models; a Westinghouse, with double phaeton body and a 30-horsepower chassis; a Delahaye chassis, a pullman and a landaulet; a Cottin-Desgouttes, and a Pilain chassis.

GLIDDEN MILEAGE NEARLY FORTY THOUSAND.

BOSTON, Jan. 14.—Mr. and Mrs. Charles J. Glidden, the world girdling automobilists, accompanied by Miss Martha Waldron Barron, of Boston, have returned after their disastrous experience in touring on the railroad tracks in Mexico. They left here in Mr. Glidden's Napier two months ago, and since then have traveled 6,168 miles, of which 5,022 miles were on railroad tracks. Mr. Glidden's car was derailed near Mexico City and wrecked. He has had it shipped to England for repairs, and next season will tour in the British Isles. Speaking of the wrecking of his car, Mr. Glidden says that nobody was to blame.

"We were running twenty-eight miles an hour," he says, "on a straight track when a rock wedged in between the main track and a guard rail was struck by the flanges of the left wheels, and we jumped the rails and ran about ninety feet. The forward wheels collapsed, and we were all spilled out, but no one was injured. Had not the wheels collapsed the car would have run up on a bank, overturned, and undoubtedly buried us all underneath with serious results. I tapped the telegraph wire, put on a set of instruments that I was carrying, and immediately opened up communication with the train despatcher at Mexico City, securing assistance in a short time in the shape of a special train. We arrived in the city of Mexico on the time planned before leaving Boston, December 31."

CINCINNATI'S SHOW AND ENTHUSIASM.

CINCINNATI, Jan. 14.—Cincinnati's first automobile show will take place January 21-26, and will be held in the Fireproof Storage Company's building, at the intersection of Walnut Hills and Avondale, two of the Queen City's wealthiest suburbs. All the space has been taken by exhibitors. There will be forty-seven different makes of cars shown by the twenty or more dealers of the city, who organized under the name of the Cincinnati Motor Car Dealers' Company for the purpose of bringing Cincinnati to the front as an automobile town. Besides the cars shown, moving pictures of the Vanderbilt Cup race, and two of the cars that took part in that event, will be seen.

It will be remembered that a few years ago pessimistic people asserted that automobiles would never find favor in a town that was "built upon seven hills." The sale of automobiles for the year 1906 was 100 per cent. more than the previous year.

THE PROFESSIONAL CHAUFFEURS' CLUB.

At the annual meeting of the Professional Chauffeurs' Club of America, held at the clubrooms, 1775 Broadway, New York City, the officials for the year 1907 were elected as follows: President, W. H. Walter; first vice-president, Fred Brevogel; second vice-president, Curt Schmidt; treasurer, W. H. Chase; recording secretary, George Loveday; corresponding secretary, P. A. Larter; governors, O. J. Byers, F. Engelsberg, F. Walsh, L. Regan.

The club has a membership of 250, is strong financially, and is looking forward to a successful year and a new clubhouse in the fall, the present quarters proving entirely inadequate.

BALTIMORE'S CLUB AND BALTIMORE'S SHOW.

BALTIMORE, Jan. 15.—With the indorsement of the Automobile Club of Maryland, which has taken over the second annual show, which will be held at the Lyric, January 21 to 26, there now seems to be no doubt that the event will be one of the largest of its kind ever held in the South. Many new features have been arranged for the show this year, and more will follow visits to the New York show by the committee appointed to attend the mammoth show in New York this week in the interest of the local show. Notwithstanding the fact that B. R. Johnson, manager of the show, succeeded in obtaining one of the largest halls in Baltimore, they will be cramped for room according to the number of exhibitors, which now nears the fifty mark. The pictures of the Vanderbilt Cup race and several other events will be shown.



THE
CONTINUATION
OF THE
GARDEN SHOW
STORY



EXHIBITS OF VARIOUS KINDS.

Auto Improvement Company.—At this exhibit is shown an extensive line of auto sundries both for use on the car and in the garage. The line includes the "Ever Ready" tire tool, for putting on and removing clincher tires; vulcanizers for use both on the car and in the garage, and the "Ever Ready" carbureter, the special feature of which is that it is especially adapted for the heavier liquid fuels. It is provided with two jets and float chambers, one of which can be used for a light grade of gasoline and the other for the heavier fuel after the engine is started.

H. A. Allers & Co.—This firm exhibits "Solarine" metal polish in both the powder and liquid form. Faith in the merit of the article is shown by giving away samples.

Avery Portable Light Company.—The ability to merely turn on the gas whenever wanted and turn it off ditto, without having to fuss with carbide or the necessity for cleaning out a generator, has appealed so strongly to the average autoist that the lighting tank long since came to be considered an indispensable part of the equipment of the up-to-date car. On this account the exhibit made by this company is a reminder to the visitor of what he has been saved by science.

Brennan Motor Manufacturing Company.—This concern shows a line of motors and transmissions ranging from a two-cylinder horizontal opposed to a four-cylinder water-cooled with mechanically operated inlet valves. The concern makes various sizes, both air and water cooled. The transmissions include both the two-speed planetary and the selective type for either side chain or shaft drive. Both transmissions and motors are furnished with annular ball bearings if desired.

Energine Refining Company.—This company exhibits samples of its Energine fuel for automobile and motor boat use of which it is the sole refiner. This fuel is claimed to possess the advantages of greater power than is obtainable with gasoline without the drawbacks of the latter, not the least of which is its objectionable odor.

General Electric Company.—The exhibit of this company is a magnet that attracts every visitor that comes its way to note the operation of the Mercury Arc rectifier, which is shown in operation. In the three years that this device has been on the market, both for public and private garages, where nothing but an alternating current service is obtainable, it has become too well-known to require description. It has met with wide-spread acceptance which is becoming greater as its advantages are better understood.

Globe Machine and Stamping Company.—Every variety of automobile part has been produced by this firm since the automobile industry came into existence. At their stand, which was in charge of Albert F. Schroeder, general manager, and O. A. Loew, chief mechanical engineer, are to be seen ball races, retainers, brakes, brake drums and bands, hub cups and flanges, gaskets, fan blades, sector tank heads and heavy metal, shallow shell and thin metal deep shell stampings in general. Not the least item

of interest in the Globe exhibit is a few sample sheet shells or caps with internal threads. The unique feature is the fact that the threads had been generated on a punch press.

E. F. Hodgson.—The autoist who has been confronted with the problem of where to stow his car without going to the expense of putting up a building and disfiguring his grounds in the process finds that his difficulty disappears at this stand. The problem is solved by the Wigwam portable garages and houses shown by this manufacturer.

Pantasote Leather Company.—This is an exhibit that interests the manufacturer of cars and will as long as leather upholstery continues to be the standard finish for the interior of the up-to-date car. Leathers of this make of every imaginable shade and texture are shown, all of them being finished with a surface especially adapted to withstand the severe usage given the upholstery of an auto.

Thos. Prosser & Son.—This firm is the agent for Krupp Special Chrome Nickel Steel, which they supply in either finished parts or in the rough. The exhibit includes a line of finished and partially finished parts as well as chips and parts which have been bent and broken to show the qualities of the metal.

Springfield Metal Body Company.—This firm shows a number of up-to-date styles in aluminum bodies, in addition to a line of special tops, the construction of which is patented.

Spicer Universal Joint Manufacturing Company.—The rapid increase in the employment of the shaft type of drive has brought with it an unusual demand for universal joints, of which those shown by this firm are representative examples. They are distinguished by extreme simplicity and generous proportion of working parts that makes for durability and satisfactory service, no nuts, bolts, screws or other fastenings being employed in their design. A number of styles are shown, such as the combined joint and brake drum, a universal slip joint with flange coupling, also double universal joints and complete sets.

C. A. Shaler Company.—This firm shows the Shaler electric vulcanizer, which is adapted for repairing cuts in shoes and also punctures in tubes. The device can readily be connected to any alternating or direct current incandescent circuit, is economical of current, and can be carried even in a light runabout without inconvenience.

Valentine & Co.—This firm exhibits a line of colors and varnishes suitable for automobile work. The company's long experience in supplying goods of this description to the carriage trade is a guarantee of the quality.

DEALERS IN GENERAL ACCESSORIES.

Auto Supply Company.—This concern displays a representative exhibit of the best known makes of accessories and they are also importers of a complete line of French ammeters and volt meters as well as goggles. In addition to the array of

smaller accessories, they also carry a complete assortment of engines, transmissions, differentials, wheels, forgings, and parts of well-known makes for builders, assemblers, and repairmen.

Charles E. Miller.—The very name Miller stands for everything that pertains to the automobile. For lack of space his exhibit is confined to the smaller and more portable types of goods, but there are more where they came from. In fact it would be easy in an hour or two with Miller's vast stock at one's disposal to pick out the components of an entire car from the ground up, including every possible accessory that could be put on it. Motors, transmissions, drives, wheels—everything in short that goes to make up an automobile, is handled by Miller.

Motor Car Equipment Company.—It is difficult to know where to begin in attempting to describe the multi-varied stock displayed by such a firm as this, covering as it does a range of supplies running from cotter pins up to tires, lamps, clothing, batteries, and what not, all of which are shown in what appears to be a practically endless array, a great many makes of the same thing such as speedometers, accumulators, and the like, representing the product of the best known makers being carried.

New York Sporting Goods Company.—As its name indicates, this concern specializes more on the accessory end, handling more particularly such lines as lamps, accumulators, dry cells, ammeters and voltmeters, tires, clothing, and the like of representative makes, of which it shows a comprehensive assortment at its stand.

Post & Lester.—This concern has the distinction of handling one of the most representative lines of imported automobile accessories to be found in this market, in addition to as complete an assortment of domestic supplies as it is possible to imagine. Some of the specialties from the other side are the well-known Volier horns and the E.I.C. racing spark plugs.

AUTO HORNS AND CHIMES.

Gabriel Horn Manufacturing Co.—The chief feature of this firm's display is the 1907 model of the Gabriel horn, which consists of but a single tube instead of the multi-tube types formerly popular. It gives three distinct tones blended harmoniously, the regulation of the tone being readily controlled by the operator at will. As the demand for the three-tube horns with two-inch tubing and the four-tube with 1 1/2-inch tubing is large, these types are continued, and various models are shown.

Gray-Hawley Manufacturing Company.—This concern displays the patented Autochime device to be used in connection with the auto muffler. It is a practical three-tone chime of extreme simplicity, involving no delicate or complicated parts in its construction. It is shown separately and in connection with the Gray muffler, making a complete combination outfit. Motorchimes and chime whistles are shown.

CLOTHING AND GLOVES.

Morrison, McIntosh & Company.—The Grinnel ventilated and air-cooled "rist-fit" gloves and gauntlets comprise the specialty displayed by this concern in a number of styles designed with a view to meeting the needs of auto and other drivers. The material employed in their construction is "reindeere" leather, and the special design keeps the hand cool in warm weather and still excludes oil and dirt.

Syracuse & Elbridge Glove & Mitten Co.—As their name indicates, the display of this concern consists of a full line of specially designed hand coverings for the auto driver.

Syracuse and Elbridge Glove Company.—This concern makes a specialty of automobile gauntlets. These are made with reinforced palms and fingers and also are arranged so that the seams are protected from wear; in short, it is claimed that the glove is especially suited to the hard use which it must necessarily stand when worn around an auto.

CASTINGS.

Light Manufacturing & Foundry Company.—Probably no other firm, in this country or abroad, has specialized to the same extent on aluminum castings as has this concern—a fact that is recognizable in the showing of its products. It is not going too far to say that their success in turning out crankcase and gearbox castings, entirely free from flaws and defects, and at the same time with a use of the minimum amount of metal, has contributed very largely to making the high-powered motor for automobile use a possibility.

Manufacturers' Foundry Company.—At first sight it appears almost inconceivable to the layman that the intricate shapes given the cylinder of the up-to-date motor with its water-jackets surrounding the valve pockets, could be reproduced in such a material as cast iron with the clean and accurate lines that distinguish the work shown by this company, of which a number of examples are on display, several of them being cut sectionally, so as to reveal the uniformity of the metal throughout as well as its entire freedom from blowholes or other defects that would be apt to render it worthless.

WHEELS AND RIMS.

Midgley Manufacturing Company.—Tubular steel wheels constitute the manufacturing line of this company. Starting from the point that a wire wheel did not look right and a wooden wheel did not work right, the Midgley company set to work to produce something which would look like a wood wheel and work like a steel one. The Midgley is made wholly of steel. Its process of manufacture is to first cut the sheet metal into proper sizes and form it into required shape under heavy presses. The rims or channels are formed under a specially built press; the under body or felloe is formed in the same way, and after the spoke holes have been punched the two are clinched together. The several parts are brazed together, the entire wheel being immersed in a molten bath of brass which flows into every corner and covers every surface with a layer of the metal. This makes the wheel one single piece; there is not a separate bolt pin or rivet in it.

Schwarz Wheel Company.—Patent wooden artillery wheels occupy the attention of the Schwarz company. A difficulty in wood automobile wheels has been the tendency to loosening of spokes under strain, the wheel becoming shaky, ceasing to run true and finally becoming useless. In the Schwarz this is overcome by the construction of the spoke, the tenons of which interlock in a fashion to render them utterly immovable. The spokes are put together at one time under pressure, each interlocking with its neighbors. Distances between the spokes are mathematically the same throughout. No hub flanges are required in making the wheel; they can be put on at any time, but are practically unnecessary until the wheel is to be put on the axle. The fact that the wood wheel may be made complete, the metal rim or channel for the tire put on, and the entire product shipped without a hub must commend itself to the practical observer.

Phineas Jones & Co.—Half a century of experience in wheel building is a record to be proud of, and that it is one that has brought with it the "know how" of the business of making wheels of the right kind, no matter how hard the service to which they are to be subjected, is plain from the attractive exhibit made by this firm of a part of the car of which the average autoist rarely thinks, except when it happens to cause him trouble.

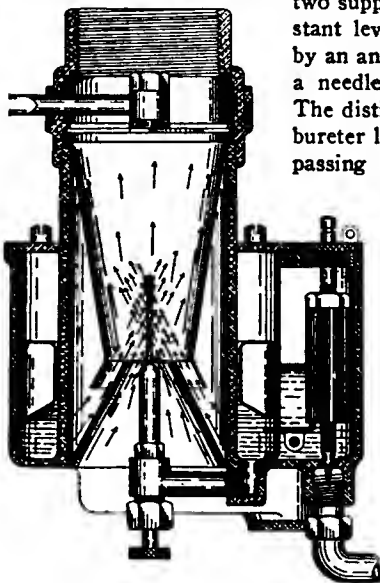
Turner & Fish Company.—Indestructible steel wheels manufactured by the Turner & Fish Company have the advantages of durability, being absolutely true, easily cleaned, collecting less mud and dust than spoked wheels. The wheel is made of two sheets of high-carbon, two-pass cold rolled steel, each sheet being drawn and formed in a skilled way. When the disks have been formed the rivet holes are punched and the halves are then riveted together, practically making a solid background for the spokes. The wheel is now ready for the hub and rim. Three

gauges of metal, weighing from 11 1-2 to 19 pounds to the wheel, are used in manufacture, making it applicable to all sizes and weights of automobiles, and having a carrying capacity of 15,000 to 50,000 pounds.

Standard Welding Company.—Seamless steel rims for all types of wheels and rims are manufactured by the Standard Welding Company, Cleveland. Regular lines comprise standard clincher rims for wood or wire wheels to standard patterns used by all tire manufacturers; standard steel rims for single tube tires having crescent, drop center or flat base. In addition, any special rim can be made to blue prints and specifications. All rims are made true to circle, with properly flared edges, and are guaranteed against inherent defects. By the Standard Welding Company's methods absolute uniformity in circumferential measurement and perfection of tire set are assured.

CARBURETERS.

F. E. Bowers Company.—The Bowers carbureter, about to be put on the market by the F. E. Bowers Co., New Haven, is a new instrument of the float feed type, having one main and two supplementary air inlets. A constant level of gasoline is maintained by an annular metal float acting upon a needle valve by means of a trip. The distinguishing feature of the carbureter lies in the air supply. All air passing through the main inlet is thrown directly upon the spray nozzle, causing a uniform mixture. The base of the mixing chamber is a cone through the summit of which passes the spray nozzle. Over this cone is placed a copper funnel-shaped vessel, the base of which forms a cone fitting round the cone base of chamber, but leaving a space between the two. Air from the supplementary inlets is drawn up between the two cones and thrown directly through the gasoline



line spray; consequently the gas is completely formed before leaving the carbureter. The instrument is only made in one size, but to obtain a larger or smaller volume it is only necessary to change the copper double cone within the mixing chamber, an easy matter owing to it merely being carried by a flange, and make necessary nozzle and air adjustments. The throttle is of the revolving shuttle type giving a central draught at all openings.

Wheeler & Schebler.—In addition to their showing of the Schebler standard, Model "D" carbureter, which is made in seven sizes ranging from half inch to three inches, and which is adapted to fit any make of automobile or marine motor on the market, this concern has just uncovered a new type which is termed Model "E." This is a Schebler special type made with bottom air draft, the latter constituting the fixed air opening while the auxiliary opening is entirely closed when at rest, in distinction to the standard model in which the same inlet provides both the main and auxiliary air supply. The new model also differs in being equipped with an arrangement for taking hot air from the exhaust of the motor. The price of this carbureter is slightly higher than that of the standard. In addition this firm shows a balance throttle adapted to be fitted to any size of their carbureters, when using a governor, as well as a line of check valves for use in connection with two-cycle engines, these being also universally adaptable.

Byrne, Kingston & Co.—This concern exhibits a very com-

plete line of carbureters adapted for all classes of work, automobile, stationary, and marine. The company has a large line of mufflers, either plain or fitted with cut-outs, adapted for all purposes.

Holley Bros. Company.—This company has a variety of carbureters, mostly of the central draft type. One of the specialties is a carbureter having the air intake at the top. This type is especially suited for marine work, where the carbureter must necessarily be placed low down.

The National Sales Corporation.—This concern is agent for the New Gaither Owen carbureter. The peculiarity of this device is that the intake pipe and mixing chamber is formed of a closed spiral spring which it is claimed tends to more thoroughly mix the gasoline vapor and air as well as form an automatic air valve.

The Heath Dry Gas Company.—This concern has perhaps the most striking novelty in the show, as its carbureter is without a float chamber, and depends solely on a suction valve to regulate the supply of gasoline between impulses. The strongest feature is a small fanwheel in conjunction with a coarse wire mesh, which it is claimed mixes and vaporizes the gasoline vapor much more thoroughly than is done in the ordinary form of carbureter.

GASOLINE AND OIL TANKS, PUMPS, ETC.

S. F. Bowser & Company.—With their gleaming metal trimmings and highly polished hardwood, the Bowser gasoline cabinets prove a potent attraction and seem better fitted to adorn a drawing room than a garage. The principal features of the exhibit are the Bowser combination cabinet, the Bowser long-distance outfit and the Bowser wheel tank. A booklet entitled "Just a Moment" has been prepared especially for distribution in connection with the exhibit and calls attention to the specialties shown.

National Oil Pump & Tank Company.—This firm displays a number of gasoline storing and pumping outfits for garages of all sizes, from its Little Hercules size up. Included in these is a long-distance outfit, a runabout tank and measuring pump outfit for garage service, to permit of the tank being taken to the car instead of the reverse, and the National automatic measuring power pump.

The Detroit Lubricator Company.—This concern shows the Hodges force feed oiler. This consists of a multiple feed individual pump type of oiler. They are supplied either self-contained or arranged with the sight feeds to be placed on the dash. The peculiarity of this device consists in having the delivery and suction valves positively operated by the operating shaft. It is an efficient oiler of the mechanical type now so generally favored by the majority of American builders of cars.

CHAINS.

National Sales Corporation.—This firm is the exclusive American representative for the Peugeot chains and rims which form the standard equipment of a number of the leading French machines. A full line of the various sizes and types in which these chains are manufactured is on display, in addition to the many other specialties controlled by this concern, such as coils, timers and other ignition accessories.

Diamond Chain & Manufacturing Co.—The products of this house are too well known to call for much description. The name diamond has been associated with the manufacture of chains so long that in this connection they are almost synonymous. Included among the extensive line of chains shown is a new series made of chrome nickel steel, rendering them extremely strong and light. In addition the Diamond I-beam front axle and hubs are displayed in a manner best adapted to show their numerous good points.

Baldwin Chain & Manufacturing Co.—In addition to the line of Baldwin block auto and machinery chains, as well as chains for motorcycle and bicycle use, this firm displays the Baldwin improved spring recoil check and the McKinney removable tire holder, a fixture for carrying spare tires. A full line of Baldwin roller chains, in both detachable and riveted types, is also shown.

Whitney Manufacturing Company.—Chains of every imaginable type form the bulk of this firm's display, including a number of forms specialized by them and with which their name is linked. Beside this array of power transmitters for every conceivable use, there is a complete showing of the Woodruff patent system of keying which has been adopted by a number of prominent automobile builders.

Charles E. Miller.—Brampton block and roller chains, considering the number of special sizes and types in which they are made, are a line of no mean proportions in themselves. They constitute one of the few, if not the only line of this kind brought from abroad and are shown in a variety of styles adapted to practically every car either made in this country or imported from abroad that uses the chain type of drive.

TOPS AND HOODS, ETC.

Sprague Umbrella Company.—No less than five different styles of auto fronts are displayed by this firm, whose name is inseparably connected with the making of tops. In addition a full sized top, covered with leather and lined with red English cravenette, is shown. Four of the fronts are steel and one solid pressed brass, all being enameled in different designs. Beside the above the new Sprague steel bows, adjustable hood and rubber bumpers are in evidence. The demand for the fronts is already large and preparations are being made to manufacture a large number of them.

Vehicle Apron & Hood Company.—Using the well-known "Blizzard" rubber cloth, this firm manufactures a complete line of tire and inner tube cases, tool rolls, top and lamp covers, auto buckets, caps with rain capes, auto shirts, sleeve protectors, dust hoods, auto robes and storm fronts, types of all of which are on view. They also show a non-skid tire band of rawhide and heavy steel rivets adapted to be laced to the tire.

PUMPS, JACKS, TOOLS, ETC.

Wray Pump & Register Company.—On the stand of this concern is to be found that greatest of essentials that should never be left behind but which is sometimes missing when most needed—the pump for inflating the tires. And as the correct pressure is more than half the battle in tire maintenance, the Wray line of pumps are also shown equipped with that very necessary addition, a compact air pressure gauge showing the result of laboring at the handle. As the work of pumping a large tire becomes very strenuous with the increase in pressure, it is usual to conclude that the tire is hard enough when a pressure gauge would show otherwise.

Duff Manufacturing Company.—Barrett jacks constitute the specialty displayed by this concern, and few autoists realize how much depends upon a good jack. One that makes raising the car difficult in order to remove a tire is a poor investment, and one that is apt to let down without any warning when an investigation is going on underneath the car is a menace. These jacks operate equally well at any angle and are guaranteed to be powerful enough to raise the heaviest car with but the exertion of one hand.

Cooks Railway Appliance Company.—This concern is the successor to the Merrill-Stevens Company, of Kalamazoo, Mich., for many years builders of standard jacks, and exhibits a line specially designed for automobile work, the essentials of light weight, great strength and general convenience and handiness,

both in use and for stowing in the tool locker of the car having received attention.

Oliver Manufacturing Company.—Peerless jacks for touring cars, New Samson jacks for garages and Oliver's E-Z jacks for auto trucks, constitute the line specialized by this concern, a full assortment of each type being shown in an attractive manner at their stand.

Stevens & Co.—This concern show a general line of automobile and repair sundries, the specialty consisting of the Noonan line of tools. Somewhat of a novelty is the Noonan Valve remover and also a valve truer by the same maker.

The Utility Co.—Shows a miscellaneous line of sundries which includes the Utility spark plug, the Crackerjack jack, the Bullard wrench, and the famous hand cleaner, "Gre Solvent."

NON-SKIDS, TIRE COVERS, ETC.

Gilbert Manufacturing Co.—Gilbert automobile fabric supplies and the patented Gilbert spare tire case and adjustable tire holders of highly polished brass that have come into such general use of late form the exhibit of this concern, which, owing to the fact that it was a pioneer in the introduction of accessories of this nature, attract much favorable attention.

Hopewell Brothers.—This firm exhibits a line of goods comprising tire cases, tool bags, tube cases, sleeve protectors and vests, all of which are made from special automobile fabrics. Their tire case is a distinctive type similar to that placed on the market by them last year. The chief feature of the display is a white tire case encircling a bright mirror with the inscription "Admire yourself and the Hopewell" tire case.

Weed Chain Tire Grip Co.—This exhibit is unique in that it represents a showing that is not duplicated by any other in the building. "As necessary as gasoline" is the motto of the makers of this anti-skidding traction device, and when the autoist finds himself in a mud hole with the wheels slipping round helplessly he will agree with it. The same concern expected to be in a position to show a new traction device for commercial vehicles, which, however, was not ready.

Allen Auto Specialty Company.—Allen's tire covers and Allen's polished bronze detachable tire holders are the features of this firm's exhibit. The tire covers are of special material—that is, water, oil and dirt-proof—and are equipped with glove fasteners which permit of putting them on or taking them off in a few moments.

MUFFLERS, CUT-OUTS, ETC.

Byrne, Kingston & Company.—In addition to its numerous other specialties, this firm displays a complete line of Kingston mufflers for both automobile and marine use in a number of varying types, plain or combined with cut-outs, and in sizes adapted to engines of all powers.

Gray-Hawley Manufacturing Co.—Automobile and marine mufflers built on the special lines evolved by this concern form the bulk of its display, which also includes a number of other specialties designed for automobile use, such as air, steam and hand pumps, valves, cut-outs and the like.

DEATH OF A PIONEER QUAKER AUTOIST.

PHILADELPHIA, Jan. 13.—Something of a shock was given local automobile trade circles on Saturday morning, when the sudden death of William Morgan, a pioneer in the industry, was announced. In 1899, in company with Louis, John, Thomas and James Clark, he organized the Autocar Company, and established a factory at Ardmore, serving as secretary and general manager until 1904, when he sold his interests to the Clarks. Later he accepted the management of the Philadelphia Locomobile branch.

NEWS AND TRADE MISCELLANY.

Two thousand skilled workmen are now employed by the Cadillac Motor Car Company, of Detroit. Within a short time the daily product of the company will reach more than fifty cars.

The Tincher Motor Car Company, of Chicago, which has contemplated the establishment of a factory at South Bend, Ind., has been absorbed by the Studebaker Automobile Company, South Bend.

In "The Vanderbilt Cup," which is being produced at the New York Theater with Elsie Janis as the star, are seen four S. & M. Simplex cars. Two of the cars are of the racing type and two are touring cars, 1907 models. One of the Simplex racing cars wins the race nightly, carrying the hero as driver.

Raleigh, N. C., is to have an automobile factory. The Dixie Motor Company, of High Point, one of the suburbs, has been incorporated with a capital stock of \$125,000 to manufacture and sell automobiles, bicycles and all parts and accessories thereof. The incorporators are E. W. Van Brunt, C. L. Dutton and H. A. Megraw, all of High Point, N. C.

The success of the tire and tire repair exhibition of the Minneapolis Automobile Club has induced that body to prepare a series of similar exhibits and demonstrations during the winter months. W. C. Crafts, of the National Tire Repairing Company, of St. Paul, recently demonstrated some new methods in tire repair and gave a short lecture on tire rebuilding.

W. B. Hurlbut, New York, manager of the Packard Motor Car Company, who lately returned from Europe, states that New York is far ahead of Paris in many ways as an automobile center. He says that of the garages in Paris will hardly show the same floor space as any one of a half dozen New York garages. The streets of Paris are not so crowded as New York with automobiles and commercial vehicles are not nearly as numerous as in New York.

On December 26, 1906, the corporate name of Cook Railway Appliance Company, of Kalamazoo, Mich., was changed to Cook's Standard Tool Company. The ownership and management remain the same. The principal reason for the change of name was that the name "Standard," by which the company's tools and appliances had long been known to the trade, had become such an important asset to the business that it was deemed advisable to protect it by its incorporation into the company's title.

The entire business of the Lozier Engine Mfg. Co., Buffalo, N. Y., has been taken over by the Du Bois Iron Works, Du Bois, Pa., a \$1,000,000 corporation. While retaining the same general appearance, numerous improvements will be made on Du Bois engines; the manufacture of the Simplex steam pump will be continued. Officers of the company are John E. Du Bois, president; W. C. Pentz, vice-president; E. A. Badger, secretary and treasurer; I. N. Hamilton, general manager; C. E. Stuart, sales and advertising manager.

W. A. Rutz will represent the Continental Caoutchouc Company at the Ormond-Daytona races next week. He will have with him a large stock of tires for

emergency equipment of racing cars, and in addition will also have tires suitable for touring cars that will be immediately available for automobilists desiring them. The Continental company announces that for the convenience of any owner tires will be provided at Ormond of the size and style required by the car. provided advance information is filed with the New York headquarters of the company at 43 Warren street.

In the matter of the interference that has been pending before the Patent Examiner in the case of the Premier Motor Mfg. Co. vs. B. A. Gramm, vice-president and general manager of the Logan Construction Company, regarding the proprietary right to a trademark for motor vehicles, involving the use of the words "car" and "quality" in various combinations, a decision has just been handed down in favor of the defendant. The priority of claim is based more particularly on such phrases as "the quality car," "the car of quality," and "that car of quality."

RECENT TRADE REMOVALS.

The Cartercar Company, of Philadelphia, has removed from the Aldine garage to 1519 Belmont avenue.

J. L. Keir, agent for the Renault car and Michelin tires in Philadelphia, will remove to 310 North Broad street in the immediate future.

R. W. Cook & Company, Chicago representative of the Royal Tourist, have taken possession of their new salesroom at 1251 Michigan avenue.

The Detroit Motor Car & Supply Company has leased the store and basement at 230 Broadway, New York City, for a term of years for a salesroom and garage.

The Auto Supply Company, formerly located in the Park Square Automobile Station, Boston, has removed to 14 Columbus avenue, in the motor mart. Manager Samuel Ascher states that the company's rapidly increasing business demanded increased facilities. The new store is one of the best located in the mart.

The George N. Pierce Company, of Buffalo, makes the announcement that the factory and offices of the company have been removed from No. 18 Hanover street to the new factory, No. 1695 Elmwood avenue. All mail for the purchasing and manufacturing department should be addressed to the new location. The new Pierce factory stands on the site of the old Pan-American midway.

NEW AGENCIES ESTABLISHED.

The Autocar Company, of Ardmore, Pa., has placed the agency for the Autocar for Camden, N. J., with C. C. Albertson, of that city.

Fraser & Reynolds, proprietors of the Rittenhouse garage, South Twenty-third street, Philadelphia, will handle the Wayne line in that city during the coming season.

The Northwestern Motor Car Company, of Philadelphia, which is temporarily located at 1943 North Woodcock street, has taken the agency for the Moline car for that city.

Thomas M. Twining, 210 North Broad street, Philadelphia, has closed a contract with the Crawford Automobile Company, of Hagerstown, Md., to handle the Crawford line.

Charles F. Hellom & Company, makers of Invader oils, have opened two branch houses, one in New York City, at 715 Seventh avenue, and the other in Philadelphia, at 648 North Broad street.

R. M. Jones and F. O. Holden are about to take over the Reo agency at the old Jefferson avenue stand, Detroit. The stand has been thoroughly overhauled and is now one of the brightest on the row.

An agency has been established by the Columbus Buggy Company, of Columbus, Ohio, for the handling of their line of electric vehicles, with Maxwell-Briscoe Chase Company, 1407 Michigan avenue, Chicago.

The Cleveland Motor Company has established a branch in Chicago at 1470 Michigan avenue, where they will share a fine salesroom and garage with the Bird Sykes Company. Richard Bacon, Jr., will manage the branch.

The announcement that the Auto Selling and Repair Company had taken up the agency for the Dragon for Minnesota was premature. The Dragon is considering several parties, and decision will be announced shortly.

From Minneapolis comes the news that the St. Louis car agency has been placed with the Auto Selling and Repair Company. The Oldsmobile agency has changed from the Barclay Auto Company to F. G. Winston, Jr., who handled the Olds line in 1905.

Detroit will soon have another automobile selling agency under the title of the Motor Sales Company. The old Northern stand, at 251 Jefferson avenue, has been secured as a garage. The firm will handle De Luxe and Queen cars and is also looking for a light runabout or electric.

Walter C. Martin, proprietor of the Cadillac Company, of New York, Broadway and Sixty-second street, has taken up the agency for the Rolls-Royce automobile, one of the best-known English machines. The Rolls-Royce Import Company will import the chassis only, the bodies being fitted in this country.

Another high-class garage has been added to the long list on Jefferson avenue, Detroit. The company, which is known as the Fee Vincent, is located between Antoine and Hastings, in the heart of the automobile center. Electric vehicles only are handled, the agency having been secured for Woods electric automobiles.

The Dragon Automobile Company, of Philadelphia, announces representation for the Dominion of Canada with the International Automobile Company, Ltd., of Montreal, being done entirely through correspondence and photographs. In the same manner three sample orders were received from different firms in Mexico.

The Western Rubber and Supply Company will handle G & J tires in Southern California, with headquarters at 1010 South Main street, Los Angeles. The company has been incorporated with the following stockholders: R. T. Brian, Guy M. West, H. H. West, C. A. Davis, R. G. Tryon, Thomas McCafferty and W. C. Brian. Guy M. West will act as manager.

The Franco-American Auto and Supply Company, of Chicago, has been appointed sole agent and distributor in all territory west of Buffalo, N. Y., and Pittsburg, Pa., for E. Lamberjack & Co., for Michelin tires, and Leon Rubay, of New York. The company will carry exclusively the Bell pressure pump, Look storage battery, L. & M. tire irons, Alden Speares Sons' cylinder oil, besides all the supplies handled by Leon Rubay, of New York, and E. Lamberjack & Co.'s full line of Michelin tires, round, flat, anti-skid or Samsonized Michelins.

PERSONAL TRADE MENTION.

L. E. Horton has been appointed manager of the Northwestern Cadillac Automobile Company, with headquarters at Minneapolis, Minn.

Joseph Tracy, the well-known automobile driver, has been retained by the Craig-Toledo Motor Company as consulting engineer. Mr. Tracy will shortly be seen driving the new Craig-Toledo roadster, which he will no doubt enter in some of the most important spring and summer events in the East.

Louis Chevrolet, at one time the champion among automobile drivers in America, has entered the employ of the Autocar Company and is at present undergoing a thorough course of instruction in Autocar work at the Ardmore factory. Later Mr. Chevrolet will be connected with the New York Autocar agency at Broadway and Eightieth street.

John L. Poole, who for some weeks has been visiting the several factories of the Buick Company, at Flint and Jackson, will shortly leave New York to take up the management of the company's foreign sales department. Agencies will be established in all European countries. Mr. Poole's headquarters will be in Paris, France, care of the American Express Company.

T. F. Byrne has been appointed manager of the Chicago branch of the H. H. Franklin Manufacturing Company. Mr. Byrne is a veteran in the automobile and bicycle business. He was formerly purchasing agent for E. C. Stearns & Co., of Syracuse, and later became secretary of the Stearns Canadian company, finally going to Australia as manager for the Canada Cycle & Motor Company.

Howard M. Post has accepted the position of advertising manager with the Quincy, Manchester, Sargent Company, manufacturers of railroad appliances, who have offices in Chicago and New York, with factories at Chicago Heights, Ill., Milwaukee, Wis., and Plainfield, N. J. Mr. Post originally fitted himself for a telephone engineer and held a position as telephone switchboard installer with the Western Electric Company, of Chicago.

Frank P. Libbey, the Salt Lake City representative of the Lozier Motor Company, has formed a connection with the Consolidated Wagon & Machine Company, of Salt Lake, and the Lozier will hereafter be represented in the intermountain district by this concern, which has branch houses throughout Utah and Idaho. The company is one of the solid financial institutions of Salt Lake, the directorate being composed of many high officials of the Mormon Church, who have shown a keen interest in automobiles for some time past.

NEW TRADE PUBLICATIONS.

Hooper Bros. & Darlington, Westchester, Pa., have sent out a 1907 tear-off calendar on which they present their fine wagon and carriage wheels and announce their different types of wood hub wheels.

An interesting booklet is just at hand from the National Carbon Company, Cleveland, Ohio, on "How to adjust a spark coil." Instructions are complete and concise, and doubtless numberless automobilists will be glad to avail themselves of the offer of the company to send a free copy on request.

"A little book which tells in narrative style the story of its conception and perfection," is the appropriate introduction to the booklet issued by the Craig-Toledo Motor Co., Toledo, Ohio. It is interesting reading and tells the various experiences which the Craig-Toledo car went through before it was considered good enough to put before the public.

Information likely to be of use to other than the automobile novice is contained in the brochure issued by the Albert Champion Company on Gianoli high-tension magnetos. A detailed and illustrated description of the magneto is given, followed by a treatise on adjustment and care of the ignition system, and useful hints on how to remedy minor defects.

A complete description, with numerous illustrations, of the Hawthorne Works, of the Western Electric Company, is given in the booklet just issued by that firm. External views of the works and a series of half-tones of the machine shops give some idea of the magnitude of the Western Electric Company's equipment.

Attractively presented in blue and gold, the catalogue of the Mayo Radiator Company, of New Haven, Conn., gives illustrations of the various types of radiators produced by that firm for the 1907 season. The line is a complete one, and amongst the radiators presented are those of several important American automobile firms regularly fitted with the Mayo product.

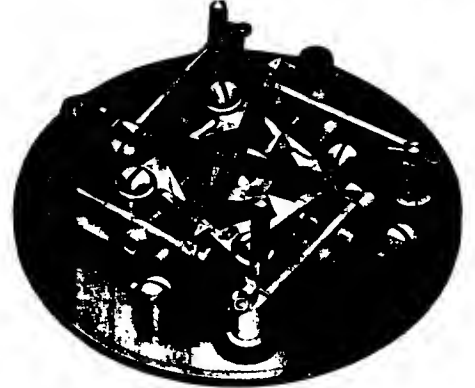
The National Sales Corporation, 296 Broadway, New York, has prepared a sheet of electros for the use of jobbers, illustrating Connecticut coils, "Soot-Proof" plugs, Royal batteries, Peugeot chains and rims, "P. D. Q." tire repair plugs, etc. The cuts are made in several sizes in order to meet the requirements of the different jobbers who may issue a large or small catalogue.

Patterson, Gotfried & Hunter, Limited, of 146-150 Centre street, New York City, have issued a new catalogue to meet a persistent demand on the part of automobilists needing tools and supplies. Articles of interest only to jobbers or blacksmiths have been kept out of the new publication, but all tools likely to be needed by the private automobilist or the garage proprietor are described by text and cuts and are priced.

A most attractive catalogue is that of the 1907 Columbia gasoline cars, which is now being distributed by the Electric Vehicle Company. It is a book of forty pages, bound in an exceedingly handsome cover done in gold tracery. The catalogue is printed throughout in two colors and contains beautifully executed half-tones of the separate models

and their component parts. One of the most striking features is an "X-ray," or shadowgraph, reproduction of the 24-horsepower touring car. This reproduction is 18 by 12 inches in size and is folded into the center of the book.

Climax Electrical Commutator.—Ignition defects are probably responsible for nine-tenths of the troubles experienced by automobilists. To remedy this A. B. Black, 21 South Market street, Boston, Mass., has produced a new timer, known as the Climax Electrical Commutator, which it is claimed will



CLIMAX ELECTRICAL COMMUTATOR.

give perfectly synchronized ignition. Each cylinder gets its spark at the exact point, keeping them in perfect time, making each do the same amount of work, no matter whether there are two, four or six cylinders, and when once adjusted needs no further attention.

A Useful Tire Tool.—To overcome the difficulties experienced in mounting and removing clincher tires, a useful tool known as the "Ever Ready," handled by the Auto Improvement Co., 316 Hudson street, New York, has just been brought out. With this instrument



EVER READY TIRE TOOL.

tire removal presents no more difficulty than does the cranking of the engine. The tool is readily inserted under the outer shoe, without any danger of injuring the inner tube, and the tire removed by an easy rotary motion. In two minutes the tire can be removed or put on.

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No. 4

A SHOW THAT HAS MADE AUTO HISTORY

WITH a final triumphal flourish that was in keeping with its undisputed reign throughout the week, that not even the most unpropitious of weather could diminish, the Madison Square Garden show came to a close on Saturday night last. It passed, but not into oblivion, for it will long be remembered as marking a standard of achievement only made possible by the accumulated experience of the seven years of effort in the

same direction that had preceded it. Judging it from the one criterion that has served as a basis upon which to decide the success of every show that has gone before—that of attendance—it is not difficult to estimate how greatly this one has surpassed the preceding Garden exhibitions. Interest in this feature of it was doubled owing to the inauguration of the experiment of charging a double admission on two days of the



THE MUCH ADMIRER "BRIDAL CAR"—AN ISOTTA FRASCHINI—A LADIES' FAVORITE AT THE RECENT GARDEN SHOW.



AN EXHIBIT OF FUNDAMENTALS THAT WAS FETCHING.

week. But neither this nor the added damper of extremely inclement weather appeared to have any appreciable effect, either on the attendance of the days in question, nor of the aggregate for the week. Last year's attendance for the week rolled up into figures of such magnitude that it was hardly thought possible that they would be greatly surpassed for several years to come, yet it is confidently estimated that the increase during the past week over that of its predecessor of a year ago ranges all the way from 10 to 20 per cent.

Models Exhibited Represented Regular Stock.

As for the business done—not even the time-honored “all sold out” begins to express it. A few years ago all the salesmen at the stands were at pains to assure the inquiring visitor that they had not a car to sell when his object in asking was known; in many instances their factories had closed contracts for every car they could possibly turn out during the delivery season long before they ever came to the show. They were only there to let the public see what they could do in the way of building cars and—they were not altogether adverse to booking a few more orders. The saying has long since passed into the limbo of other forgotten things, though seldom before has the maker come to the show with so much of his output sold in advance as was the case during the past week. The business of rushing work night and day for several weeks prior to the show in order to be able to ship a few models at the last moment is another thing of the past. The great majority of the cars that were rolled into place on the Saturday previous were as ready for exhibition as the decorations were to receive them, and both had been prepared with plenty of time to spare. With the exception of the polished chassis, which has come to represent a fixture, the cars staged at last week's show were not the laboriously prepared samples of other days. In but few instances did they lack anything but a supply of fuel, lubricating oil and batteries to make them ready for the road. Nor were they the first of their kind—the advance agents of their line for the coming season; far from it in numerous instances, as 1907 models galore have been in the hands of purchasers since last summer.

The Placing of Orders More or Less a Formality.

As to the actual amount of business done, that is something that is next to impossible to estimate with any degree of accuracy. That it has been large, both in individual instances as well as in the aggregate, and that it has exceeded by a substantial margin the amount done during any previous show week, may be taken for granted. A few years ago the makers generally were very keen about the business to be done at the show. It was really the opening shot of the season and was depended upon in very large measure to provide a book full of

orders to keep the factory busy during the period intervening between the closing of the show and the coming of mild weather. The maker is probably no less keen about booking orders now than he ever was; but there has been a very radical change in this respect during the past few years, and its influence was never more apparent than during the show just closed. The show is no longer looked upon to the same extent as a market place, despite the fact that more actual orders were probably booked during the week in question than during the first three or four shows combined. But in all probability the same makers would have received those orders anyway—in other words, the show has come to be more or less of a formality where a large majority of autoists are concerned, though it still forms a sort of initiation for the constantly increasing number of recruits who find in the shining array of cars of all types an attraction too strong to be successfully resisted.

Technical Education of Buyers Is Noticeable.

But in the crowd that filled the aisles and swarmed over every booth for ten to twelve hours a day and every day the doors were open, it was harder than ever to spot the novice. If there be any one far-reaching effect for which the automobile may be said to be entirely responsible it is that of education. The curriculum has been diversified, but in no other respect is the effect so marked as where the mechanics of the car are concerned. People who had about as much idea of the technical requirements of the automobile as they did of the infinitesimal interim now talk learnedly of cylinder capacities and dimensions with regard to the horsepower as if they had been brought up on it, where formerly hardly one in a hundred could distinguish the transmission from the differential and had utterly no conception of the clutch or the reason for its necessity. To realize the extent to which this education has been carried on, or more properly speaking, the number of people who may be said to represent the automobiling public, it was only necessary to join the interested group invariably to be found surrounding one of the many polished chassis shown and listen to



POPE-TOLEDO DASH SHOWING FOLDING WINDSHIELD.

the string of questions fired at the salesman, who was doing his best to elucidate matters to an audience of varying degrees of automobile education. Where formerly there would have been but one mechanical "sharp" as the nucleus of such a group, half a dozen were in evidence. To quote a prominent maker, "the public now wants to know so much that the average inquirer is far from satisfied with the maker's statement that his motor deliver 25 to 30 horsepower. He wants to know the why and how of it, and what is more, he wants particularly to know how it is that blank's motor of smaller dimensions delivers more power, or why its builder says it does." And this is more than ever true of the power behind the checkbook, the women of the family. True enough, there were just as many who tried to give a horse-show flavor to things by exhibiting their elaborate toilets from the most conspicuous places; others whose only idea was to pose in the front seat of a car, and still others whose sole idea of a machine's merit was gained by jumping up and down a few times on the seats to test the

this capacity is still far greater than the supply, and the "mechanical man" or the "factory man" is as much a refuge in case of need as ever. But the fact that must have struck the observant eye, familiar with what has gone before, in the most forcible manner, was the close approach to standardization that has been reached, whether the cars were considered in the aggregate or in groups outlined by price limitations. In either case a composite might readily be made, including cars of both foreign and domestic origin, that would approximate so closely to a standard type of automobile as to make it difficult at first sight to note how the individual features of many of the varying forms of construction had been blended to form the whole. This was particularly noticeable when a comparison was made of the principal features of construction as represented by the leading foreign and American-built cars, in many cases a comparatively unimportant detail here and there not apparent to any but the trained eye, marking the only visible difference.



FOURTH AVENUE END OF MADISON SQUARE GARDEN, WHERE THE DEMONSTRATING CARS WERE LINED UP AWAITING ORDERS.

resiliency of its upholstery while comparing the blending of colors in its exterior finish. This is a contingent that will probably always be in evidence to about the same extent, but that there has been an amazing increase in the number of women who can talk motors, gears and drives intelligently was something that could not fail to impress the observant and it put the salesmen on their mettle more than ever, for if it is humiliating to have a well-rehearsed story turned awry by a man and its teller stranded in a mass of contradictory statements, how much more so is it when done by a woman?

Close Approach to Standardization Was Noticeable.

Education has also overtaken the salesman in a great many instances, but there are not lacking those in which he is the same impossible being that he always was. "Four-cylinder vertical motor in front, 40-horsepower, multiple disc clutch, selective transmission, shaft drive" is still the burden of his song that has only changed in detail with the march of improvement. The only explanation is that the industry has grown so exceedingly fast that the demand for technically informed men in

Quick Work Signaled the Dismantling at the Finish.

Just as the show with all its variegated paraphernalia and trappings swooped down on the Garden and occupied it to the last niche, with the same celerity it packed up and decamped after the most successful week it has ever enjoyed. Within less than twenty-four hours after the closing hour Saturday night, the floors and balconies were again as empty and the walls as bare as is their usual condition. A large number of the exhibits complete were sent direct to special freight trains that were awaiting their arrival. Elaborate plans had been made for the quick transfer of the exhibits to the Chicago show, and before the New York show had grown cold they were on their way to the Windy City in special trains which left for the West Monday morning.

The Turin (Italy) Automobile Club is organizing a six days' touring contest for the week of June 18-23. This contest will be run in lieu of the hill-climbing contest up Mont Cenis, which was suppressed by the authorities.

CHICAGO'S DECORATIVE SCHEME.

Not to be outdone by its eastern rival, Chicago has been putting forth strenuous efforts for the past two or three months in anticipation of revealing as elaborate and complete an effort in the form of an automobile show as has ever been thrown open to the public. Accustomed to doing things on a vast scale, it has made preparations to house the automobile in a setting calculated to surpass anything hitherto attempted where beauty and elaborateness of decoration are concerned, as well as to uphold its name for record-breaking achievements. In short, Chicago's show is to eclipse all former efforts, whether of the home or foreign talent; it is to be the largest ever held, whether in this or any other country. As was the case last year, every available square inch of space afforded by both the Coliseum and the First Regiment Armory, diagonally backing it on Michigan avenue, will be utilized. There will be a greater number of exhibitors, both of cars and accessories, than has ever participated in any American show—more than 300, in fact—and the problem that has confronted the management has been how to accommodate all that desired to have space. No one thing accentuates the magnitude of the show as a whole, so much as the fact that of the total number of exhibitors, 102 will display complete cars—the greatest number that has ever been brought together on a similar occasion in this country. Added to these there will be 190 exhibits of accessories of every conceivable nature and eight of motorcycles.



MERCURY,

The fleet-footed messenger of the gods, will be a prominent factor in the Chicago Show decorations.

The combined buildings contain more than 80,000 square feet of available space, which is said to be twenty-five per cent. greater than the total floor space occupied by any automobile show ever held outside of Chicago, not even excepting that of the St. Louis Exposition of two years ago. Further details of the plan of decoration adopted for the main floor of the Coliseum serve to give a better idea of the elaborate scale on which this is to be carried out than the advance announcements published some time previous. As an instance of this, there may be cited the fact that the arches which will form the dominating feature of the decorative scheme will range from 3 to 5 feet 6 inches in height and from 14 to 22 feet in length. The smaller arches have been designed with a view to the ornamentation of the accessory sections of the show, while the larger ones will be employed in the sections devoted to cars. One of the accompanying photographs illustrates a section of one of the smaller arches in question. The material employed is staff, while the finish is an old ivory shade. Another of the illustrations shows the square cap which will serve as the ground piece for the vertical columns. Wherever one looks the figure of Mercury will be in evidence. As the deity symbolical of one of the chief attributes of the automobile—that of

speed—his figure will dominate every stand. Two of these figures will be placed on a low pedestal in the foreground of each exhibit, one of them being utilized to bear a brass sign carrying the name of the car shown at each space. The principal sign will be readily distinguishable at each of the spaces, and they will be of raised letters in white and gold, on scarlet background, topped off by a long narrow piece of ornamental staff forming a cap for the sign, and above this will be the arches referred to. Huge quantities of staff will be employed in a variety of forms.



A. M. C. M. A. PLANS.

Although no definite announcement was made, it is understood that at the recent meeting of its committee of management the American Motor Car Manufacturers' Association decided upon some important plans for next winter's automobile show. The report that the Grand Central Palace affair of last month permitted a return to exhibitors of \$45,493 was received with much favor, and this might be expected, especially when it is known that members of the association received an additional 20 per cent. dividend.

The plan of having a central organization for activity in good roads was recommended for an open discussion at the annual meeting to be held in Chicago, when some action will be taken with a view of supporting and working with the National Association of Automobile Manufacturers on the plans recently outlined, which have for their purposes a centralization of all those organizations interested in securing good roads, so as to have concerted action along definite lines. A coalition of interests with this end in view must result in incalculable benefit to the industry as a whole, and no effort will be spared by the American Motor

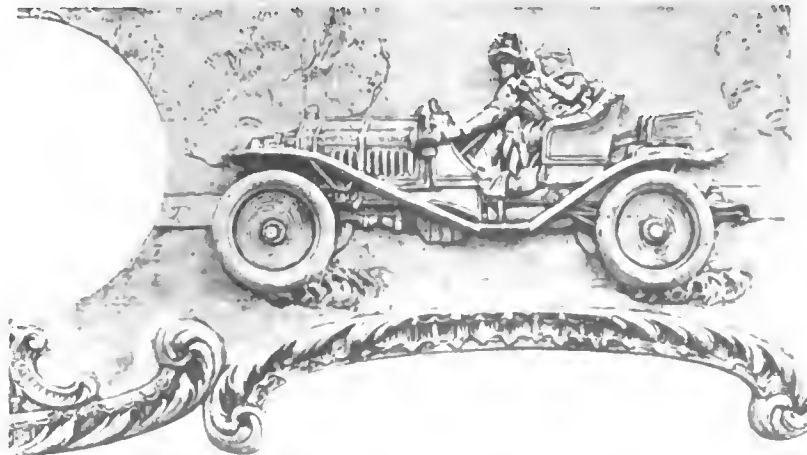


CAPS SURMOUNTING THE COLUMNS.

Car Manufacturers' Association to make the movement a pronounced success.

There are now forty prominent manufacturers of motor cars in the organization, which has been in existence less than two years. The annual meeting of the organization will be held on February 7, during the Chicago automobile show.

Two pounds to the horsepower is said to be the weight of latest Santos-Dumont aerial motor.



HALF-SECTION CHICAGO SHOW DECORATION, SHOWING BAS RELIEF.

MECHANICAL BRANCH A. L. A. M. OPEN SESSION

METAL Alloys Applied to the Various Parts of Automobiles" was the subject for discussion at the first day's meeting of the Mechanical Branch of the Association of Licensed Automobile Manufacturers, while the subject of gears and magnetos occupied the second day's session. Breaking away from the precedent hitherto adhered to of making these meetings something in the nature of star chamber proceedings, representatives of both special interests were invited to be present and take part in the discussion. Representing the ignition end, there were present: Robert Bosch, head of the American house handling the Simms-Bosch magneto; Messrs. Remy, of the Remy Electric Company; Forein, of the Holtzer Cabot Company; Holly, of Holly Brothers; Hull, of the Polyphase Ignition System Company; Leon Rubay; Hart, of C. F. Splitdorf; Herz, of the Herz Manufacturing Company, besides representatives of the Heinze Electric Co., and Lavellette & Company, owners of the American patents on the Eisemann magnetos. From the gear-making interests there were present Messrs. Beall, of Brown & Sharp; Burgess, of the Boston Gear Works; Fellows, of the Fellows Gear Company; Cameron, of Gould & Eberhart, Jr.; and Gleason, of the Gleason Works.

To aid in bringing out the points that it was desired to emphasize, every one of the manufacturers of magnetos provided a sample of his machine, which was shown both complete

and dismantled. The chief point dwelt upon was the necessity of standardization in order that any magneto on the market might be made readily applicable to any car without the necessity of any machine work. Another important feature of the discussion was as to the best position for the magneto—whether it should form an integral part of the motor itself or whether it should be considered an accessory and placed on the dashboard.

On the subject of gears the questions as to the value of different types, such as spur, bevel, helical and the like, was taken up in connection with the feature of the gears themselves, such as the proper length, width and pitch of the teeth, their general conformation and the relative efficiency in practice of the various types. The matter of the most suitable methods of cutting gear-teeth of different characters was also taken up and discussed at length. The members present were Hiram Maxim, Electric Vehicle Co.; Elwood Haynes, Haynes Auto Company; S. H. Cutler, Knox Auto Company; J. H. Jones and A. L. Riker, The Locomobile Company; Russell Huff, Packard Motor Car Company; M. C. Bernin, Lozier Motor Co.; G. J. King, Northern Motor Car Co.; David Ferguson, George N. Pierce Company; L. D. Hubell, Pope Motor Car Company; S. N. Sanborn, Alden, Sanborn & Company; H. E. Coffin, E. R. Thomas Detroit Company; Ralph Morgan, E. R. Thomas Motor Company, and F. D. Howe, Waltham Manufacturing Company.

SOCIETY OF AUTOMOBILE ENGINEERS' ANNUAL MEETING

ONE of the chief events of show week just past was the second annual meeting and dinner of the Society of Automobile Engineers, which was held at the New Grand, Thursday afternoon and evening, the dinner, at which forty-four of the members were present, being held between the two sessions. The afternoon session was opened by the reading of a paper by Thomas J. Fay, the subject originally assigned him having been "Some Features of Construction." Mr. Fay explained that his idea had been to talk about some features of construction on well-known cars that he did not like, but as this would savor too much of public disparagement, he had taken up the subject of materials instead, and gave a very interesting talk on steels and aluminum for automobile work, which aroused general discussion and brought out many valuable points. He was followed by Thomas J. White, who read a carefully prepared paper on alcohol, which, in view of the present situation where this fuel is concerned, was of unusual interest. In the discussion that followed Joe Tracy gave his experience in the use of this fuel on his recent test run, and numerous facts not commonly known were brought to light.

After the dinner the evening session was opened by the reading of a paper entitled "Some Facts Pertaining to Electric Ignition," by Henri G. Chatain. The paper was based upon numerous test experiments made with a high tension Simms-Bosch magneto, as well as on a large number of induction coils of both American and foreign makes. The results were illustrated by oscillographs thrown on the screen by a stereopticon. A great many slides were used, graphically showing every phase of current and potential change during the revolution of the inductor, and accurately establishing the electric range of the latter throughout which the current can be advantageously used for ignition, as well as the corresponding relation this bears to the crankshaft revolution. A large number of slides were also used to illustrate the differing characteristics of a great many induction coils of well-known makes, and voluminous data pertaining to them was given in connection with the result of each experiment, making the

paper, as a whole, one of the most valuable of the kind that has been prepared in this country. Mr. Chatain said, by way of introductory, that he had been led to investigate the subject by reason of the fact that the only information extant as to the requirements was that a "hot" spark or a "fat" spark was what was needed, but that, after a great deal of experimenting he had been unable to exactly determine the nature of these characteristics, particularly a "fat" spark, a statement that aroused considerable merriment. He was followed by Henry Hess, of the Hess-Bright Company, who read a paper on "Change Gears and Their Journals," which was also profusely illustrated with the aid of the stereopticon, showing a large number of change-speed gear boxes of standard makes, as well as a great amount of graphic data in connection therewith. He also explained the requirements necessary where the load was simply radial or thrust, or where it was of both natures and the sizes of ball bearings to fit each case, beside citing some of the causes for their failure, chief among which was the prevailing impression that a bearing of this type does not require any lubrication, and that there is no particular necessity for protecting it from dirt. Mr. Hess's paper was interspersed with a number of witty sallies.

Owing to the time required for the presentation of the illustrated papers, there was no opportunity for discussion, and for the same reason the election of officers for the coming year had to be postponed, a resolution continuing the present incumbents in office during the interim being passed unanimously. Among those present were A. L. Riker, E. T. Birdsall, H. M. Swetland, H. L. Pope, Joe Tracy, Henry Hess, Thomas J. White, Henri G. Chatain, Thomas J. Fay, F. D. Russell, W. G. Wall, Paul L. Snutsel, C. E. Reddig, R. D. McDonald, Mr. Heckel, A. C. Schultz, J. G. Perrin, G. E. Franquist, A. M. Holcomb, Charles F. Barrett, R. M. Beck, Lindley D. Hubbell, L. H. de L. Espel, Mr. Miller, Herbert L. Towle, R. B. Wasson, H. F. Donaldson, Mr. Acker, J. N. Ellsworth, H. F. Barker, L. T. Gibbs, H. P. Mooras, George O. Gridley, Mr. Conover, C. B. Hayward and Harold H. Brown.

N. A. A. M. ELECT OFFICERS AND REVIEW THE YEAR

RESPONDING to the call for the annual meeting of the executive committee of the National Association of Automobile Manufacturers, Inc., fourteen of the fifteen members gathered at the Victoria Hotel in this city on Thursday last. The chief business before the meeting was the election of five members of the committee to serve three years. The balloting resulted in the election of Thomas Henderson, Winton Motor Carriage Co.; Benjamin Briscoe, Maxwell-Briscoe Motor Co.; M. J. Budlong,



ALBERT L. POPE,

Vice-president Pope Mfg. Co.

Elected President of the National Association of Automobile Manufacturers.

Electric Vehicle Co., and E. H. Cutler, Knox Automobile Co., who were candidates for re-election, and William Mitchell Lewis, Mitchell Motor Car Co., who had not previously served on the executive committee. After the annual meeting of the association, which was sandwiched in between the two meetings of the executive committee, the newly elected committee convened for the purpose of electing officers for the association. The balloting resulted as follows: Albert L. Pope, Pope Manufacturing Co., president; S. D. Waldon, Packard Motor Car Co., first vice-president; Thomas Henderson, Winton Motor Carriage Co., second vice-president; William E. Metzger, Cadillac Motor Car Co., third vice-president; W. R. Innes, Studebaker Automobile Co., treasurer, and L. H. Kittridge, Peerless Motor Car Co., secretary. S. A. Miles continues as general manager.

At the first meeting of the executive committee L. E. Burr was elected to represent the Woods Motor Vehicle Co., in place of J. Wesley Allison, and E. P. Chalfant to represent the Waltham Manufacturing Co., in place of F. E. Bradley. A resolution was adopted exempting the cars which took part in the elimination trials and the Vanderbilt race itself from the provision of the rule which prohibits manufacturers from exhibiting cars at local shows. The good roads committee announced that the work of forming a national association had progressed to such an extent that a substantial appropriation by the N. A. A. M. seemed desirable, and suggested that \$5,000 be set aside for the purpose, to be used only on condition that twice that sum be raised by the other associations interested. The executive committee indorsed the recommendation, but referred it to the new executive committee for definite action. The contest committee reported that it had prepared a set of rules for a contest, which were ordered printed and a copy transmitted to each member of the executive committee, pending a full discussion at a later meeting. In accordance with an arrangement entered into with the Motor and Accessory Manufacturers, Inc., under which it is intended that eventually the membership of the national association shall consist exclusively of manufacturers of automobiles, all makers of parts and accessories being referred to the newer organization, the resignations of the following associate members were accepted: Motsinger Device Manufacturing Co., National Carbon Co., Brown-Lipe Gear Co., Baldwin Chain and Manufacturing Co., Fisk Rubber Co., Whitlock Coil Pipe Co., Rose Manufacturing Co., Electric Storage Battery Co., Twentieth Century Manufacturing Co., Diamond Rubber Co., Badger Brass Manufacturing Co., G & J Tire Co., Hartford Rubber Works Co., Shelby Steel Tube Co., Veeder Manufacturing Co., R. E. Dietz

Co., Dayton Electric Manufacturing Co., B. F. Goodrich Co., and the Goodyear Tire and Rubber Co.

This meeting was followed by the annual meeting of the association, at which forty-two members were in attendance. The report of President E. H. Cutler dealt exhaustively with the work of the past year. Commenting on the progress of events, Mr. Cutler said:

"It is a source of satisfaction to your president to be able to make, with unqualified pleasure, the statement that the development of the automobile industry during the past year has been fully in keeping with the optimistic view of the outlook as it appeared a year ago, and that the favorable conditions that prevailed have continued, and seem likely to continue, among those manufacturers who conduct their affairs on sound commercial lines. It is gratifying to note that among those concerns which practically everyone regards as the leaders of the industry (nearly all of whom are included in the membership of this association) there has been a disposition toward reasonable conservatism, and no disposition to force upon the market a greater number of cars than the market will readily absorb. In the quality of cars there has, of course, been marked improvement. So long as these two features go hand in hand there is little doubt about the continuance of that prosperity with which the automobile industry has heretofore been blessed.

"It has been the policy of the executive committee of this association, representing, as the members believe, the truly national organization of the United States, to adhere firmly to the conservative principles on which the association has been successfully conducted for the last seven years. It has been their endeavor to build up and help to perpetuate an association whose membership is regarded by the public as an indication of the stability of the member, and which, therefore, shall have among its members none but those concerns which have proved beyond question that they are deserving of the public's confidence.

"The result of this policy has already been made evident. During the early days of the organization, when its organizers were anxious to secure a large membership, little attention was paid to the standing of the applicant. Indeed, the condition of the industry at that time was such that there were few manufacturers old enough to have established themselves very firmly in the public's confidence. Some of the members who were admitted at that time have since fallen by the wayside, but it is a source of gratification that the policy adopted in later years has built up a membership among concerns so reliable that failures among them are practically unknown."

The report commented at considerable length on the efforts of the association to prevent unreasonable legislation, and showed that the efforts had been eminently successful. The association's test case in New Jersey is still proceeding. The case appears on its face to demand that no license at all shall be required, but the association would be perfectly satisfied with the establishment of the principle that one license must be recognized in all parts of the country. The test was commenced in 1905, and has been carried through the Magistrate's Court, the Court of Common Pleas and the Supreme Court of New Jersey. It has now reached the Court of Errors and Appeals, and will, in due course, be carried to the United States Supreme Court. The report also presented many interesting details relative to the good roads movement. It will be printed and forwarded to the members of the association in due course. The treasurer's report showed the financial condition of the association to be eminently satisfactory, the balance in the hands of the treasurer being considerably greater than at the same period last year, despite somewhat heavy outlays during the interim. This will be largely increased by the Chicago show. No rebate will be given exhibitors, a reduction in space rates being made instead.

HOTCHKISS, OF BUFFALO, TAKES A. A. A. HELM

MUCH is expected of the new administration of the American Automobile Association. William H. Hotchkiss was an able president of the Automobile Club of Buffalo, and under his leadership the New York State Automobile Association became strong and energetic. Now the man from Buffalo has taken the A. A. A. helm, and the effects of his early occupancy of the office are apparent.



W. H. HOTCHKISS,
The New A. A. A. President.

The concluding session of the old board of directors and the first meeting of the succeeding board were held at the new clubhouse of the Automobile Club of America last Thursday and Friday. The organization being a New Jersey corporation, it was necessary to hold a proxy meeting of stockholders at East Orange, N. J., on Friday morning.

Under the influence of the magnetic enthusiasm of the new president extensive and far-reaching plans were outlined for the immediate future. Charles Thaddeus Terry is to head the new legislative board; Robert P. Hooper, of the Automobile Club of Germantown, will retain the chairmanship of the good roads board, and it has been known all along that Mr. Hotchkiss particularly desired Jefferson deMont Thompson to continue as racing board chairman.

The other chairmanships will be announced very shortly, as the new president does not desire to lose any time in getting under high speed. This is apparent by the quick completion and announcing of the executive committee upon which will devolve much of the work hereafter, owing to the constitutional change whereby the board of directors will only meet in March, September, and December. President Hotchkiss names as the four additional members of this committee William K. Vanderbilt, Jr., Jefferson deMont Thompson, A. G. Batchelder, and Sidney S. Gorham. The president, first vice-president, and treasurer are members by reason of their offices.

Neither Mr. Farson, the retiring president, nor Mr. Gorham, the secretary, sought a continuance in office. Mr. Elliott, the new secretary, is especially fitted for his task because of an uninterrupted occupancy of the New York State Automobile Association secretaryship. Herewith is the new official roster:

Officers of the A. A. A. for 1907.

- President—William H. Hotchkiss, Automobile Club of Buffalo.
- First Vice-President—Lewis R. Speare, Bay State Automobile Association.
- Second Vice-President—Asa Paine, Florida East Coast Automobile Association.
- Third Vice-President—Ira M. Cobe, Chicago Automobile Club.
- Treasurer—George E. Farrington, Automobile Club of New Jersey.
- Secretary—Fred H. Elliott, Syracuse Automobile Club.
- Executive Committee—William H. Hotchkiss, Lewis R. Speare, William K. Vanderbilt, Jr., Jefferson deMont Thompson, A. G. Batchelder, Sidney S. Gorham, George E. Farrington.

Board of Directors.

- New York State Association—W. H. Hotchkiss, A. C., of Buffalo; Oliver A. Quayle, Albany A. C.; Colgate Hoyt, A. C. A.; W. K. Vanderbilt, Jr., A. C. A.; Jefferson deMont Thompson, A. C. A.; A. R. Pardington, Brooklyn, N. Y.; S. B. Stevens, New York Motor Club; A. G. Batchelder, New York Motor Club; N. M. Pierce, Binghamton A. C.; H. S. Woodworth, Rochester A. C.; F. B. Hower, A. C. of Buffalo.
- Massachusetts State Association—Elliott C. Lee, Massachusetts A. C.; Lewis R. Speare, Bay State A. A.; J. P. Coghlin, Worcester

- A. C.; S. L. Haynes, A. C. of Springfield; G. E. Bliss, Maiden A. C.; W. H. Chase, Wachussetts A. C.

- New Jersey State Association—Frederick R. Pratt, N. J. Automobile and Motor Club; George A. Post, North Jersey A. C.; J. H. Edwards, A. C. of Hudson County; George E. Farrington, New Jersey A. C.; W. E. Edge, Atlantic City A. C.; K. G. Roebbling, Mercer County A. C.

- Illinois State Association—John Farson, Chicago A. C.; Ira M. Cobe, Chicago A. C.; Sidney S. Gorham, Chicago A. C.; George W. Ehrhart, Decatur A. C.; S. P. Irwin, Bloomington A. C.

- Ohio State Association—F. T. Sholes, Cleveland A. C.; Windsor T. White, Cleveland A. C.; Val. Duttonhoefer, Jr., A. C. of Cincinnati.

- California—Dr. Milbank Johnson, A. C. of Southern California.
- Connecticut—J. Howard Morse, Hartford A. C.; George M. Sanders, New Britain A. C.

- Florida—Asa Paine, Florida East Coast A. A.

- Georgia—H. J. Lamar, Macon A. C.

- Louisiana—Albert Mackie, A. C. of New Orleans.

- Maryland—W. S. Belding, A. C. of Maryland; Osborne I. Yellott, A. C. of Maryland.

- Michigan—Paul H. Deming, A. C. of Detroit; D. Emmet Welch, Grand Rapids A. C.

- Minnesota—Frank M. Joyce, Minneapolis A. C.; F. A. Wood, St. Paul A. C.

- Missouri—Roy F. Britton, A. C. of St. Louis.

- Pennsylvania—George H. Smith, Quaker City Motor Club; Robert P. Hooper, A. C. of Germantown; Phillip S. Flnn, Pittsburg A. C.

- Rhode Island—William P. Mather, Rhode Island A. C.; R. L. Lippitt, Rhode Island A. C.

- Texas—E. H. R. Green, Dallas A. C.; H. S. Crawford, San Antonio A. C.

- Wisconsin—James T. Drought, Milwaukee A. C.

Inaugural Address of President Hotchkiss.

The inaugural address of President William H. Hotchkiss is a most interesting document, containing much worth careful reading, and digestion. It is herewith given in its entirety:

In assuming the executive office of the association, I deem it proper to lay before you certain matters of present importance to American motorists.

A Truly National Body.—The association is now in its fifth year. It comprises 5 State associations, 23 clubs and organizations not affiliated with State bodies, and 267 individual members. The State associations are made up of 48 clubs, having 7,035 members. The grand total of membership is 8,857, scattered over all the States and federal districts, except Oklahoma. It is the only truly national organization devoted to the pleasure and sport of motoring. It is still in its infancy, with its work hardly organized and its functions and powers little appreciated. Those who are charged with its management, therefore, should approach their duties with a proper sense of responsibility. On their work may depend the making or the marring of a cause vital to but thousands now, but soon to be that of the tens, nay the hundreds, of thousands of the coming horseless age.

Merely a Central Committee.—Motorists are chiefly interested in good roads, fair laws and ordinances, and in a proper observance and enforcement of them. Thus, the functions of government with which they are most concerned are the police and taxing powers; both functions of the State, rather than of the nation. Their interests thus being local, the work to be done in their behalf must be done largely in their home communities.

Hence, this association did most wisely when, at a recent meeting of this board, it modified its by-laws in ways tending to encourage the organization of affiliated State associations wherever motorists are sufficiently numerous or interested. This step should be followed by a comprehensive plan whereby the active control of movements toward better highways and fair local legislation shall be vested in such State associations; the national body as to these matters becoming merely a central advisory committee. Such



FRED H. ELLIOTT,
Elected Secretary of the A. A. A.

a plan would, of course, leave with the association proper the control of all legislation and activities national in their scope. To this end I urge the early adoption by the board or its executive committee of a statement defining the limits and the powers of the State and national bodies; this that neither may trench on the sphere of the other, and all work harmoniously for the common cause.

Federal Legislation.—Our American system of independent federated States makes any national legislative program difficult. Motor vehicle laws now in force differ widely in their provisions as to the rate of speed, the means of identification, the penalties for violations, and the fees or taxes paid. Some States are liberal; others, by leaving these matters to their cities and towns, almost prescriptive. In present conditions I mean the newness of the motor vehicle as a means of transportation and the prejudice created by a few heedless or brutal drivers—these differences will for a time continue, and, perhaps, increase. Activity by State associations will, however, hasten the inevitable day when the only local regulation as to speed will be that a motorist shall not drive at a greater rate than is reasonable or proper, having regard to the traffic on and the condition of the highway at the time. Whether such consummation shall be reached before motor vehicles become more numerous on the streets and roads than horse-drawn vehicles is a question. That, perhaps, depends more than we think on how sanely we and our neighbors now drive. But, the day will come, and before the closing of the century's second decade!

Of late, however, there has sprung up in some States a tendency which must be checked—a tendency to treat the non-resident motorists as good picking, a tendency, in short, to tax. Several States permit the non-resident owner of a motor vehicle to operate at within their boundaries without additional registration, some even without limitation as to time, always provided the motorist observes the police regulations there in force. In such States the horse-drawn and the motor-driven vehicles are, so far as possible, on an equal footing, as they should be. Elsewhere, however, desire for revenue has led to a State toll tax, in the shape of a license or registration fee. The amount exacted is not yet large, but the scheme is yet young. Legislators who bring in bills enforcing new ways of getting revenue, especially from the so-called privileged classes, are, perforce, popular with their constituencies. The cloud no larger than a man's hand may soon darken the sky. Immediate action is essential. The call for it is already strident and country-wide. What shall that action be?

The demand is for federal regulation of the motor vehicle as an agency of commerce and intercourse. How far such demand is reasonable and its realization possible have of late been much debated. It should early have attention from the association's legislative board, and should be pressed to a conclusion in the next Congress.

Clearly, a tax on a non-resident's property while temporarily in the taxing State, such property presumably being already taxed in the State of the owner's residence, might, because contrary to general law, be difficult of enforcement. Hence, a greedy State attempts to evade by requiring non-resident owners or operators to register for purposes of identification, and furnishes those registered with numbers, seals or licenses, all on payment of a so-called fee. The sum total of these fees creates a fund much in excess of the State's outgo, which, with some unction, the State devotes to the maintenance of its improved highways!

Now, it is not the function of this association, as such, to quarrel with the lawmakers of States, who, in an exercise of the police power, pass registration laws affecting resident motorists and devote the surplus revenue thus obtained to the up-keep of highways. That matter is one for each State association to handle as best it may. If there is thereby no double taxation—which there may be—and if registration for identification purposes is, in present conditions, a reasonable exercise of the police power—which it probably is—then there can be no just complaint.

But when a motorist thus tagged and taxed chooses to drive his car into or through another State, it may well be urged that both the requirement of additional registration and the exaction of a fee or tax therefor is unlawful, because an unreasonable exercise of the police power. If thus unlawful, it is also unconstitutional, because an unjust and unwarranted interference with the commerce and intercourse between the States. The State of the motorist's residence has provided means for his identification in case he violates law or does injury. No other State should be permitted to do it over again.

Without further argument at this time, however, the following considerations are suggested, to the end that discussion may be stimulated and the work of the legislative board and the corresponding local committees be somewhat guided:

(1) It is within the police power reserved solely to the State by the fathers of our government to regulate the use of the State's highways by citizens of all the States, provided such regulation is reasonable, and does not interfere with free interstate intercourse. Thus, Congress has perhaps now no power to pass a law fixing rates of speed or providing penalties.

(2) While laws enforcing the police power must be uniform in their operation, conditions may exist which permit different laws for different classes of persons. Thus, in present conditions, the States probably have power to pass motor vehicle laws requiring registration and regulation speed.

(3) Identification being, however, accomplished by the registration features of the law of a motorist's residence, a new identification required by the law of another State is probably an unreasonable exercise of the police power and, if so, unlawful.

(4) The decisions of the Supreme Court and the tendencies of public opinion warranting the conclusion that the word "commerce" in Article I, Paragraph 8, of the Federal constitution means not only business intercourse, but also intercommunication in a broad sense, Congress probably has power to pass a law, for instance, whereby a motorist may certify to some department or bureau of the national government that his motor vehicle is duly registered in his own State and that it is his bona fide intention to use such vehicle in a State or States other than that of his residence, and that, thereupon, and on a certificate of such filing being issued to him, he shall become exempt from further registration under the laws of another State.

(5) That, as to other features of motor vehicle laws, uniformity can be obtained only through such bodies as the present Congress on Uniform Laws, which meets each year with the American Bar Association, and is made up of commissioners appointed by the governors of the different States, one of whom at this time fortunately is Charles Thaddeus Terry, the attorney for the National Association of Automobile Manufacturers.

(6) That State associations and clubs can, perhaps, solve the problem more simply by securing from State legislatures provisions which shall exempt non-resident motorists from the registration features of their laws.

How far it is safe to leave so important a matter to revenue-seeking States should first be determined. If thought unwise—granting always that the legal views here suggested are correct—the legislative board should divide its work into two branches: (1) The preparation of a federal bill to prevent duplicate registration and numbering, and present the same at the opening of the sixtieth congress in December; and (2) after proper investigation and discussion, the drafting of a sample or model motor vehicle bill, which, when agreed to, should be presented to the Congress on Uniform Laws next August, to the end that the same may be presented to the various State legislatures for adoption. The federal bill, if enacted into law, would end the confusion, annoyance and expense due to multiple registration; the other might, in the end, eliminate State lines as to speed, penalties and rules of the road.

Only by a program which is equally broad can the association perform its duty to its members and American motorists generally.

Increased Membership.—An active campaign for new members should be begun at once. The association is already large, but, when compared with the number of motorists in the country, is really small. This condition can be easily remedied, and must be if the national body is to continue really national. Further, the increase must be geographical as well as numerical. Particular attention should be given those States where the motor vehicle is as yet little used, and centers of activity formed which shall combat existing prejudices and, if possible, shape future laws.

This work will naturally fall on the executive committee and the secretary, and plans should be at once made which will be both comprehensive and practical. Consistent and persistent work should result in doubling within the year not only the total membership of individuals, but also of the affiliated State associations and clubs. Each city and village of 10,000 population in, at least, the Eastern, Northern, and Middle Western States, should have an automobile club, and such clubs should, as soon as possible, be federated into State associations. To these ends, there should at once be prepared circulars detailing the advantages derived from membership and outlining the steps necessary to club organization, with sample by-laws to help toward uniformity. The present individual membership of the association should be the nucleus of this work.

Finances.—The work just outlined will require funds considerably in excess of the membership revenues of the association. Fortunately, due to the careful management of the last Vanderbilt Cup Race by the retiring racing board, the association begins the fiscal year with a goodly surplus. A similar addition to the treasury is expected from the race in October. Increased membership, too, will correspondingly increase our revenues. But great care will be required to keep expenses down. Indeed, other means of raising revenue may perhaps be required, and sooner or later the association must adopt a financial policy which will put at its disposal from dues alone sufficient funds to do its work.

Roads and Parkways.—As already suggested, the function of the national body is here but advisory. The day has not yet come when federal aid can be expected, much less counted on. Present

(Continued on page 201.)

PREDETERMINATION OF MAXIMUM MOTOR POWER*

By R. ARNOUX, VICE-PRESIDENT TECHNICAL COMMITTEE, AUTOMOBILE CLUB OF FRANCE.

WE have just seen how in a motor of given dimensions, varying with the angular velocity, the power increases. It now remains for us to note how these elements increase with the geometric dimensions of the motor. For this we must still consider the equation (8), which may be stated as follows:

$$\frac{P}{\pi D^3 C} = p_m \cdot \frac{\omega}{2.60} \quad (12)$$

Since the study of a motor of given cylinder capacity shows that the product of the average pressure by the angular velocity (which product is equal according to this last equation to the volumetric power, that is the relation of the power to the volume of the cylinder) reaches a maximum and that at this maximum the function preserves a high constant value, it may be asked if, in view of this experimental constant, it would not be possible to establish a predetermined formula of the maximum power of explosion motors, in which only the cylinder and one of its geometric dimensions, such as the bore for example, would enter.

With this aim in view, we have compiled in Table No. 1 the data resulting from experiments made with 96 motors of varying dimensions and types of construction. This table gives the diameter of the bore, the total piston travel, the maximum power and the angular velocity of each motor, expressed in turns per minute at which this maximum power is developed. All of the motors from which the data were drawn for the table in question were of the four-cylinder vertical four-cycle type having but a single piston in each cylinder; their cylinder diameter, or bore, varying between a range having 65 mm. as its minimum and 190 mm. as its maximum; their cylinder volume varied between .9 and 16.25 liters, their maximum power between 10 and 148 horsepower, and their angular velocity between 950 and 1,650 turns per minute. Particularly where the factor of angular velocity is concerned, it will be noted that this element varies but little, as its value in the case of the least powerful motor, No. 1, was 1,450 r. p. m. and but 1,250 r. p. m. for the most powerful motor, No. 96. Regarding the mean linear speed of displacement of the piston, this was 3.62 meters per second in the case of the first motor developing 10 horsepower, and 7.70 meters per second or more than double, for motor No. 96, developing 148 horsepower.

Tabulated Results of Extensive Experiments.

An examination of this table in which the motors are grouped in the order of the diameter of their bores, demonstrates that, among motors having the same diameter bore, it is not those which have the longest stroke, and in consequence the greatest volume, which develop the greatest power, and as we are striving to derive a formula permitting of the predetermination of the maximum power that a motor of given cylinder dimensions can develop, we have chosen among the 96 motors of Table 1 those which developed the maximum power with regard to their cylindrical volume. By carrying the volumes on the abscissæ and the corresponding powers on the ordinates, we have obtained the alignment of the 12 points shown in Fig. 2. If the relation of the power to the volume of the cylinder, a relation to which we have applied the term "the highest volumetric power," were constant and, in consequence, independent of the dimensions of the motor, the 12 points shown on Fig. 2 would be ranged along a straight line rising directly from its point of origin. Now, if this relation be calculated by taking motors which are extreme instances, it will be found that the volumetric power reaches 12.55 horsepower per liter in the case of the weakest motor and drops to 8.31 horsepower per liter in the case of the

most powerful. After that it was quite clear that it was necessary to attempt to make these 12 points on a parabolic curve of the form of

$$P = kVn,$$

in which *k* is a parameter of similitude, *V* is the total volume of the cylinders and *n* an exponent less than unity. This parabolic, of which the axis coalesces with the line of the abscissæ, is the following:

$$P = 11.1. V, 9,$$

which gives the maximum power, in horsepower, obtainable from a motor of total cylindrical volume *V*, expressed in liters or cubic centimeters.

Volumetric Power Decreases as Dimensions Increase.

This is of interest in that it demonstrates definitely that the volumetric power of the internal combustion motor decreases constantly in proportion to the increase of its dimensions, and in consequence of its power. We have already demonstrated above that this volumetric power is equal to the product of the mean pressure by the angular velocity, a product which we have

NUMEROS d'ordre	DIAMETRE du cylindre en mm.	COURSE du piston en mm.	VITESSE LINEAIRE des têtes par mètre	PUISSANCE maxima en chevaux au frein	NUMEROS d'ordre	DIAMETRE du cylindre en mm.	COURSE du piston en mm.	VITESSE LINEAIRE des têtes par mètre	PUISSANCE maxima en chevaux au frein
1	65	75	1450	10	49	127	140	1350	45
2	65	70	1600	12,5	50	130	145	1340	50
3	70	80	1400	12,4	51	130	128	1350	60
4	75	75	1480	17,5	52	135	132	1400	65
5	75	82	1250	14	53	135	140	1300	56
6	80	90	1250	14,5	54	140	145	1300	67
7	84	110	1200	15	55	140	145	1380	70
8	84	100	1500	49	56	140	160	1150	60
9	85	100	1500	21	57	140	150	1280	63,5
10	85	110	1550	19,5	58	140	128	1400	76
11	85	100	1650	18,4	59	144	150	1350	77
12	85	90	1600	22,5	60	145	150	1300	72
13	87	124	1150	20	61	145	155	1200	67
14	88	130	1150	17	62	150	160	1400	81
15	90	120	1400	20	63	150	165	1200	72
16	90	130	950	18	64	150	160	1250	76
17	90	100	1500	22,5	65	150	148	1400	90
18	90	95	1600	24	66	150	155	1450	85
19	92	135	1200	18	67	155	160	1250	82
20	95	130	1150	30	68	155	150	1400	93
21	95	95	1650	26,8	69	155	160	1150	79
22	95	110	1600	24,3	70	155	150	1350	85
23	100	140	1250	32	71	160	172	1250	86
24	100	150	1150	24	72	160	165	1300	96
25	100	105	1500	33,3	73	160	200	1200	101
26	104	130	1350	33,5	74	160	140	1350	101,5
27	104	120	1250	31,8	75	160	170	1250	90
28	104	110	1550	27,7	76	160	180	1200	80
29	104	120	1500	25,4	77	160	158	1350	105
30	105	140	1150	30	78	165	180	1200	96,5
31	108	150	1100	33	79	165	175	1150	93
32	110	130	1350	36	80	165	155	1200	110,5
33	110	110	1550	40	81	165	140	1380	105
34	110	125	1400	36,5	82	170	150	1200	100
35	110	140	1150	30	83	170	175	1050	110
36	110	142	1280	31	84	170	165	1200	120
37	115	115	1550	45	85	175	180	1200	115
38	115	130	1340	36,4	86	175	185	1150	109
39	115	125	1400	40	87	175	170	1300	126
40	120	140	1350	43	88	180	145	1250	110
41	120	145	1150	40,5	89	180	150	1200	115
42	121	130	1300	47	90	180	150	1200	125
43	120	122	1350	52	91	180	160	1100	120
44	122	130	1300	50	92	180	160	1300	135
45	125	130	1480	56,25	93	185	150	1300	125
46	125	135	1200	42	94	185	160	1100	130
47	125	140	1200	40	95	190	185	1250	148
48	125	130	1150	57,5	96	190	200	1150	130

TABLE NO. 1.—Data from experiments made on 96 four-cycle, four-cylinder motors, one piston per cylinder.

* Translated from "Bulletin Officiel de la Commission Technique." By Charles B. Hayward. Continued from pages 49-51, issue of January 10.

further shown is proportional to the density of the mixture at the end of the aspiration by the frequency $\frac{\omega}{260}$ of that aspiration. As the variation of that frequency is very small, as may be seen by reference to Table I, the conclusion is that the density of the explosive mixture corresponding to the maximum power developed by an internal combustion motor, decreases constantly in proportion to the growth of its dimensions and the power of the latter.

It is easy to see that this depends on the length of the gaseous column contained between the air inlet of the carbureter and the head of the piston, a distance that is necessarily augmented with the increase of the linear dimensions of the motor and in consequence, with its power. In fact, that which regulates the power of the internal combustion motor is not the loss in volume of the aspiration, nor the relation of the gaseous volume aspired to the duration of the aspiration, which increases without limit with the angular velocity of the motor, but the loss in weight, or loss of mass. It may easily be demonstrated thermodynamically that the latter passes a maximum in the same time that the function,

$$\frac{\sqrt{L \cdot r}}{r}$$

in which *logê* designates a Napierien logarithm and *r* the relation of the upward pressure to the downward pressure. The maximum of that function is obtained by reducing its derivative to zero,

$$\frac{1}{r^3} - \frac{2}{r^2} \log_e r = 0$$

which gives:

$$2 L \cdot r = 1,$$

from which:

$$L (r^2) = 1 = \log_e e.$$

$$r = \sqrt{e} = \sqrt{2,718} = 1,649$$

where the inverse is equal to 0.6065. This is then the depression produced by the displacement of the head of the piston, which is the direct function of the speed of that displacement, reaching (1-0.6065) or 0.4 of an atmosphere, of which the loss (relative to the mass) of the gas inspired reaches a maximum. The reason for this maximum is easily discernible owing to the fact that the fluid is highly compressible. The loss in volume evidently grows without limit with the speed of the motor, but the density of the gaseous mixture and in consequence, the work of the cylinder, tends, on the contrary, toward zero.

On the other hand, the loss in weight of the gaseous mixture, which is the direct function of the depression and inversely of the density of the flowing mixture, reaches a corresponding maximum, as we shall see, at the depression of 0.4 of an atmosphere. But the gaseous fluid, flowing under that difference of pressure, has to travel a distance increasing with the geometric dimensions of the motor, and its loss in weight, which regulates the power developed, varies, all other things being equal, as may be shown thermodynamically, inversely with the length of the inlet piping. Independently of the diameters given to the latter as well as to the valves, it is that length of the gaseous column contained between the air inlet of the carbureter and the head of the piston, which compels its reduction as much as possible as well as giving rise to the necessity for equalizing it between the different cylinders, where it is desired to produce the maximum amount of power from a cylinder of given dimensions. Builders of motors giving a high actual horsepower for aviation, as well as high power for their weight, have solved the problem by placing the carbureter in the immediate vicinity of the inlet valve of each cylinder.

The Bore With Relation to the Maximum Power Obtainable.

The predetermination of the maximum amount of power of an internal combustion motor, given one other element beside the cylindrical volume, the bore, for example, has occupied

engineers closely for the past three years. M. A. Varlet, engineer of the Delahaye works, first proposed, in 1903, a formula based on the square of the diameter of the bore, which has been revived very recently by the Technical Commission. The fact which led M. A. Varlet to propose such a formula, was the constance of the linear speed of the piston, a speed which, with the, at that time, almost universal employment of the automatic inlet valve, varied but little with the geometric dimensions of the motors and, in consequence, with their power. It may be readily demonstrated, in fact, that if this linear speed be designated by *v*, there will result, employing the preceding notations:

$$v = \frac{2 C \omega}{60}$$

from which:

$$\omega = \frac{60 v}{2 C}$$

and in carrying that value of ω to the equation (8)

$$P = \frac{\pi \cdot v \cdot p_m}{16} \cdot D^3$$

an expression, independent of the travel of the piston, which may be reduced to a parabolic function of the second degree,

$$P = K D^2$$

in which *K* is a constant, if it be admitted that the mean pressure *Pm* corresponding to the maximum power, is equally con-

PUISSANCE en CHEVAUX	DIAMÈTRE en MILLIMÈTRES	PUISSANCE en CHEVAUX	DIAMÈTRE en MILLIMÈTRES	PUISSANCE en CHEVAUX	DIAMÈTRE en MILLIMÈTRES	PUISSANCE en CHEVAUX	DIAMÈTRE en MILLIMÈTRES	PUISSANCE en CHEVAUX	DIAMÈTRE en MILLIMÈTRES
1	20	36	103,1	71	137,3	106	162,6	141	188,
2	30	37	104,4	72	138	107	163,2	142	188,6
3	37	38	105,6	73	138,7	108	163,8	143	189,2
4	42,5	39	106,8	74	139,4	109	164,4	144	189,7
5	47	40	108,2	75	140,2	110	165	145	189,2
6	50,2	41	109	76	141	111	165,6	146	189,8
7	53,2	42	110	77	141,8	112	166,2	147	189,3
8	56,1	43	111	78	142,6	113	166,8	148	189,9
9	58,8	44	112	79	143,4	114	167,4	149	187,4
10	61,3	45	113,2	80	144,2	115	168	130	188
11	63,6	46	114,3	81	145	116	168,6	151	188,6
12	65,9	47	115,3	82	145,7	117	169,2	152	189
13	68	48	116,4	83	146,4	118	169,8	133	189,5
14	70	49	117,6	84	147,1	119	170,4	134	190
15	72	50	118,8	85	147,8	120	171	155	190,5
16	74	51	119,9	86	148,5	121	171,6	156	191
17	76	52	120,9	87	149,2	122	172,2	137	191,5
18	77,8	53	122,1	88	150	123	172,8	138	192
19	79,4	54	123,1	89	150,7	124	173,4	139	192,4
20	80,8	55	124,1	90	151,4	125	174	140	192,8
21	82,3	56	125	91	152,1	126	174,6	141	193,2
22	84	57	125,9	92	152,8	127	175,2	142	193,6
23	85,6	58	126,8	93	153,5	128	175,8	143	194,1
24	87,1	59	127,6	94	154,2	129	176,4	144	194,8
25	88,6	60	128,4	95	154,9	130	177	145	195,3
26	90	61	129,3	96	155,6	131	177,5	146	195,7
27	91,4	62	130	97	156,3	132	178	147	196,3
28	92,8	63	130,8	98	157	133	178,5	148	196,8
29	94,2	64	131,7	99	157,7	134	179,1	149	197,2
30	95,6	65	132,6	100	158,4	135	179,6	170	197,7
31	96,9	66	133,4	101	159,1	136	180,2	171	198,4
32	98,3	67	134,2	102	159,8	137	180,7	172	198,5
33	99,6	68	135	103	160,5	138	181,2	173	199
34	100,9	69	135,8	104	161,2	139	181,8	174	199,4
35	102,1	70	136,6	105	161,9	140	182,4	175	200

TABLE NO. 2.—Maximum power output (in horsepower) of four-cylinder motors with regard to the diameter of their bore (in millimetres).

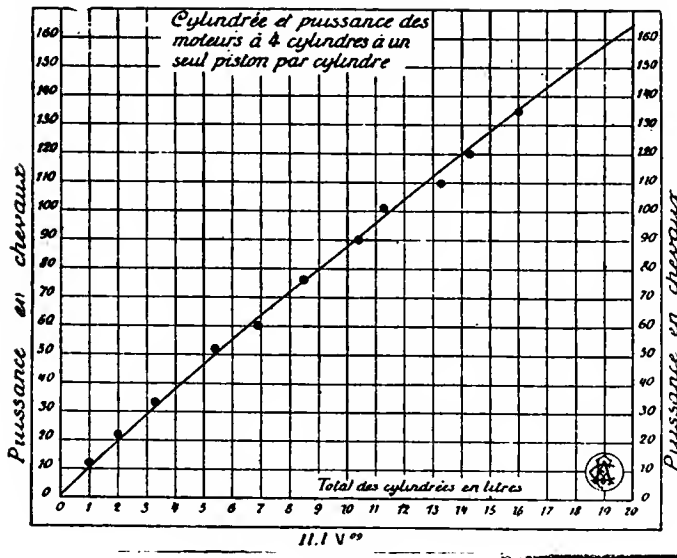


FIG. 2.

stant in all motors, or independent of their dimensions. It is further clear that the same result will be obtained by admitting the constance of the product of the mean pressure P_m , by the speed of displacement of the piston.

There is but a single method of verifying the accuracy of that formula, which is that of comparing the results it furnishes with those directly obtained by experience. This is what has been done in the compilation of the chart Fig. 3, on which the bore diameters, expressed in millimeters, are carried on the abscissæ, and the corresponding maximum powers expressed in horsepower (chevaux) of the 96 motors tabulated in the first table. These powers are indicated by the points, each of which is surrounded by a small circle. Despite the considerable differences in power represented by motors of the same diameter of bore, it will be seen, nevertheless, that the law of increase of these powers where the bore is concerned, indicates a net parabolic curve; but it is indicated clearly by the tracings of the parabola of the second degree:

$$P = 0.0028 D^3$$

so that if the parameter K be calculated in such a manner as to give the exact values, that is, equal to those of the mean corresponding to current bore diameters between extremes of 85 and 105 millimeters, they give powers slightly superior to those shown by actual experience in the case of small motors, and very much less in the case of motors of large bore. The degree of the parabola KD^3 is then itself very weak.

For this reason we have been engaged for the past several months in the attempt to establish another parabolic formula in departing from the following hypotheses. In lieu of assuming the geometric dimensions to be constant and independent of the product of the mean pressure by the linear speed of the piston, the product of that same pressure by the angular velocity may be considered as practically constant, which appears to be the result drawn from the results of experimental tests on a lot of thirty motors, the data of which we have in our possession at the moment. Under these conditions the formula (8) demonstrates that the power of the internal combustion motor is proportional to its cylindrical volume. On the other hand, experience shows that, all other things being equal, as the travel of the piston is increased or diminished, the angular velocity corresponding to the maximum power of the motor varies in an inverse sense, so that the product of the travel by that angular velocity reaches a maximum practically corresponding to the square of the bore, that is, a stroke equal to the diameter, which gives the formula of the cube of the diameter of the bore:

$$P = 0.000025 D^3$$

which was published by our colleague, M. Lucien Perisse, in his study on the Estimation of the Power of an Automobile Motor,

which appeared in August, 1906, in the *Bulletin de la Commission Technique*. At the moment, the results furnished by that formula agree quite correctly, as shown by page 40 of the work of our colleague, with the results of the experimental tests which we had at that time. Since the data of the experimental tests collected by us in working on another lot of 60 motors, and carried on the same chart, Fig. 3, together with the preceding lot, at the same time that cubic parabola,

$$P = 0.000025 D^3$$

were traced, making it clear that in furnishing figures more in accordance with the experimental results of the experiments, than those of the parabola of the square of the diameter of the bore, the degree of the cubic parabola is very high, since the inverse of the parabola of the square gives very weak values for the powers of the motors of small bores, and very high for those of large bores, if its parameter K be calculated for that which gives exact values for medium bores.

The degree of the representative parabolic function KD^n is contained between two and three. M. Farnoux, technical editor of *L'Auto*, after having adopted the exponent 2.15, manifestly too feeble, has proposed the use of the exponent 2.4, which, according to our calculations, gives a parabola on which the variation of the curve follows more faithfully that of the curve relying on the most elevated points of the basis furnished by the experimental tests charted in Table 1. The parabolic formula which we have adopted, and which is a formula of the maximum, that is, making clear the maximum power obtainable from a standard motor of given bore, is the following:

$$P = 0.000525 D^4$$

This gives in horsepower (chevaux) the maximum power obtainable from four-cylinder, four-piston motors, of which the bore is expressed in millimeters. The calculation of the power with that formula necessitates the employment of a table of logarithms, for which purpose we have calculated and compiled Table 2, which gives these results instantly from one horsepower up, the maximum power obtainable from internal combustion motor built according to standard practice, given the diameter of the bore.

Electric cabs in Berlin provided with Hagen accumulators run on an average 37 miles per day and have to be charged twice. *L'Industrie Electrique* gives the cost of working as follows: Energy, 4.25; maintenance of accumulators, 3; sundry repairs, 1.25; maintenance of tires, 4.38; making a total of 12.88 francs per diem. Average receipts per fare are 2.15 francs.

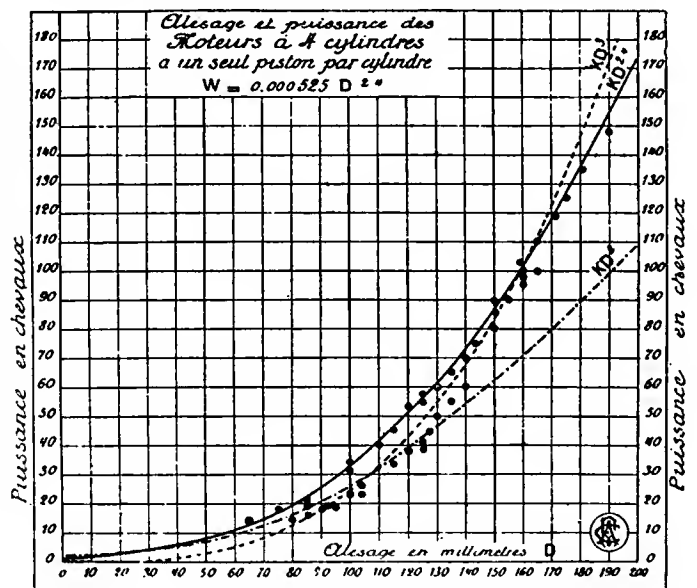


FIG. 3.

LETTERS INTERESTING AND INSTRUCTIVE

A Problem in Cylinder Lubrication.

Editor THE AUTOMOBILE:

[538.]—I am a constant reader of your valuable paper and have derived many benefits from your answers to your subscribers, and thought no doubt you could help me. I have a four-cylinder Ford runabout. The engine is splash lubricated from a force feed oiler. The oiler has only two sight feeds, one leading to the universal joint and the other to the crankcase. The latter feed pipe enters the crankcase in the middle, and should, I suppose, feed the same amount of oil to both pairs of cylinders, as the crankcase is divided into two compartments. This, however, is not the case. The first cylinder gets an excess of oil, the second a little less, and so on, and the last cylinder gets hardly no oil at all. Could you offer any suggestion which would remedy this fault?

Raleigh, N. C.

JAS. J. THOMAS, Jr.

From our knowledge of the car to which you refer, we can scarcely bring ourselves to believe that the unequal lubrication you mention can exist with everything in proper adjustment, especially in view of the fact that we have never heard of a similar difficulty with any other car of the same make, several thousands of which are in use. What evidence do you find that makes you sure the trouble exists as you state it? Is there any serious overheating, or scoring of cylinders, or seizing of pistons? And, also, are you sure that you are using oil of a proper quality? The fact that there is only a single lead to supply the lubricant for the four cylinders has little bearing on the case, unless the lead is obstructed or feeding too slowly, since if there is enough oil in the crankcase its effective distribution to the different cylinders should be insured by the splash action alone, especially on level roads. On hills, with only the single crankcase partition, the distribution might be slightly less even than with the three-partition construction often utilized, but this effect is practically very well equalized in that you do not run continuously uphill or down, but alternate the two. Do you find the fault especially intensified in climbing long grades, and are you certain that you maintain a high enough level of oil in the crankcase?

Another Ambitious Young American.

Editor THE AUTOMOBILE:

[539.]—Kindly print in your valuable paper the answers to the following questions. I am a boy 16 years of age, and am trying to make an automobile. Can I use a marine motor in an automobile? The name of the motor is the "Little Skipper." If a boy had an auto that made at highest speed eight miles an hour, would he have to get a license? How can you get one, and does it cost anything? Could he run it himself? Will you kindly print a list of books on how to make an auto, with their prices?

New York.

VICTOR J. CONDE.

As your ambition does not soar above eight miles an hour, the marine motor can be used in an automobile—if it has power enough to move the frame and running gear on which you mount it. The only difference between the usual marine motor and the automobile motor is greater weight and slower speed, particularly as most small marine motors are of the two-cycle type. This does not prevent its use on an automobile, however. Whether your car makes eight or eighty miles an hour, the law says that it must be registered, cost \$2. Send to the Secretary of State, Albany, for application blanks. But if you are on the right side of the policemen in your neighborhood, better keep the \$2 and say nothing. It is doubtful if your car will ever fracture the speed limit so badly that you will have to appear in court, and the average guardian of the law will be more interested in your success in building a machine than in inquiring if you have a license. No license to run it will be required. You may run it yourself, just as long as it will go. There are no books that treat specifically on how to build an automobile, but there are many which show how automobiles are built, such as Homan's at \$2, which is probably the best for your purpose.

Specific Gravity of Anti-freezing Solutions.

Editor THE AUTOMOBILE:

[540.]—I am interested in the subject of anti-freezing solutions for winter use, and although I have closely followed everything that has appeared on the subject both in "The Automobile" and elsewhere, I have been unable to obtain the information I am seeking. I am familiar with the exact percentages required to prevent freezing at certain temperatures, but I wish to know what the specific gravity of these solutions is in order to be able to keep track of the condition of the mixture from time to time, as my car steams slightly when run steadily even in cold weather. For instance, a 25 per cent. solution of calcium chloride will withstand temperatures ranging from 10° F. to zero, and will freeze into a mushy mass, doing no harm, but unless such a solution is maintained constantly at this point it is apt to do damage by crystallizing on the interior of the jackets, piping and radiator. As there is no way of calculating the amount of water lost by steaming, there is the danger of creating a hard deposit by adding too little water, and of overweakening the solution by adding too much, so that in the event of freezing, the very damage that is sought to be prevented is apt to occur. If the specific gravity of solutions of various strengths were known, it would be easy to keep track of their condition simply by dropping a hydrometer into them from time to time and adding sufficient water to restore it to the known standard. What I would like to know is, what is the specific gravity of solutions of calcium chloride in the proportions of three, four and five pounds to the gallon, also a saturated solution? Can any of your readers help me out on this, particularly with regard to the saturated solution?

H. S. CHAPIN.

New York City.

Although data as to the temperatures at which solutions of water and calcium chloride of varying strengths will freeze appears to be plentiful, there does not seem to be any as to the specific gravity of such solutions. However, with the aid of a hydrometer there should be no difficulty in obtaining it with very little trouble. Take a glass graduate holding a pint or quart and fill it with water; if the former add a quarter pound, and in the case of the latter half a pound of calcium chloride, and the result will be a 25 per cent. solution. By ascertaining the number of quarts of water required to fill the circulating system of your car, it will be very easy to figure how many pounds of calcium chloride should be added to make a 25 per cent. solution. The specific gravity of a saturated solution can be ascertained in the same manner. A simple method of keeping track of the state of the solution without the use of a hydrometer would be to mark a line on the radiator reached by the solution when first put in. Whenever steaming caused the liquid to fall below it, sufficient water to restore it to the level indicated by the mark would be certain to maintain the solution at the required density. If any readers of THE AUTOMOBILE have had experience along the lines indicated, we should be pleased to hear from them.

Putting Away Storage Battery for the Winter.

Editor THE AUTOMOBILE:

[541.]—Will you kindly tell me if there is a dry storage battery made that can be charged with an Apple dynamo? I have understood that there is such a battery made, also if such a battery (if there is one on the market) would stand all winter and not be used could be charged in the spring without refilling. I have a storage battery in a four-cylinder car, and during the winter months the car is idle, as we do not have good roads to run on, and would like to know what is the best thing to do with a battery where it is idle for this length of time.

D. T. DUKE.

Wellsville, N. Y.

There is no such thing as a "dry" battery of any kind, using the word in its literal sense. The so-called dry cell is only such in the sense that the active solution is held in suspension by means of some absorbent material, such as sawdust. The object of so doing is merely to eliminate the disadvantages attendant upon the use of a liquid, the efficiency of the cell being slightly impaired by reason of the fact that the solution cannot circulate, thus coming into constant contact with every part of the elements, as is the case in the wet cell. The same is true in the

case of the accumulator, except that what is commonly known as "water glass" (silicate of soda) is employed to prevent splashing. Sufficient of this is added to the electrolyte or acid solution of the cells to bring it to the consistency of a heavy jelly, somewhat like glucose. It is variously termed by makers putting out this type of cells as "solid" or "non-fluid" electrolyte, and its sole advantage consists of the fact that the solution cannot spill. On the other hand, the specific gravity of the solution cannot be kept track of, the efficiency is reduced for the reason already given in the case of the dry cell, and a longer time is required to recharge the cells when exhausted. On the whole, it is paying a rather high price for the single advantage mentioned.

Such a storage battery can be readily charged with an Apple dynamo or any other source of direct current of the proper voltage. As already stated, the only difference between it and the standard type lies in the use of a non-fluid electrolyte. No storage battery made can be put away for an indefinite length of time and impressed into service again whenever wanted without taking certain precautions. If they are omitted the cells are bound to be injured. They should be charged to their full capacity and then fully discharged at their normal rate until the voltage drops to 1.7. The electrolyte should then be dumped out and the elements washed in distilled or fresh, clean rain water and put away in a cool, dry place until wanted again. To put into service in the spring it is only necessary to fill with fresh electrolyte made from chemically pure sulphuric acid and distilled or rain water, testing it with a hydrometer to get the proper specific gravity. Fill the cells until the solution stands at least one-half an inch above the top of the plates.

What Causes Irregular Running Here?

Editor THE AUTOMOBILE:

[542.]—I read with much interest the article in your issue of January 3, written "By the Man at the Wheel." I have a French car, 24-horse rating, and have lately experienced a great deal of trouble with it. In starting the car when cold I find that only two or three of the four cylinders fire, and this difficulty is accompanied by a popping sound in the carbureter, indicating that the mixture is too poor. After the car is run for a few minutes and warmed up the cylinders seem to fire regularly, but the car is very prone to "lay down" whenever the throttle is open wide.

I have carefully examined the inlet and exhaust valves on starting the car, and find they all work freely, as do the hammers for the make and break. I have taken off the carbureter repeatedly and find I have a strong flow of gasoline from the end of the pipe leading into the carbureter, and the openings in the carbureter are clear and free from any dirt or foreign substance. I recently removed the carbureter from this car, and installed a carbureter from another car of the same make and power, which car runs beautifully. For twenty minutes after installing this carbureter my car ran perfectly, and then relapsed into the same way of running as it had with the other carbureter. The gasoline feed is by gravity, and I have carefully examined the small hole in the vent of the cap, which is not clogged up.

On opening the throttle suddenly the car will sometimes pop back, which would show there was not enough gasoline in the mixture, and at other times the car will "buck," which would indicate that the mixture was too rich. I have raised and lowered the float in every conceivable position, and have also adjusted the automatic air valve in a dozen or more different ways without seeming able to remedy the trouble.

As the matter now stands, my car does not run nearly as well as it did, and there is not much pleasure in driving a car which you know is not behaving properly. I would be very glad to have you suggest a remedy in the columns of your magazine.

Passaic, N. J.

"PERPLEXED."

In view of your experience and that of the alleged "experts" who have attempted to arrive at a solution of the cause of the trouble outlined in your letter, you will be able to appreciate that it is doubly difficult to attempt to diagnose such a case at long range. We think, however, that you have made a mistake common to most autoists under the circumstances, and that is in jumping at conclusions. You have adopted a hypothesis and assumed it to be true, and have continued to work along the same line so long that you have come to regard it as true

and as if nothing else could be at the bottom of the trouble. For instance, you say, "the car will sometimes pop back, which would show there was not enough gasoline in the mixture, and at other times will 'buck,' which would indicate that the mixture was too rich." While we cannot exactly grasp the significance of "buck" in this connection, we presume you mean that the motor loses power, or fails to carry the load when the throttle is opened. But there are few, if any, conditions of running that are infallibly indicative of a certain cause, such as your conclusion that the popping is due to a weak mixture, or that the "bucking" is the result of a reverse condition. The majority of autoists fail to realize within what extremely wide limits of mixture the engine will work satisfactorily once it becomes warm enough to insure ignition, and are all too prone to ascribe uncertain working to the mixture. If the motor has been running a sufficient length of time to get warm, it will usually ignite mixtures far too weak or too rich to start on, though the power will be decreased in either case and the fuel consumption be greater in the latter.

Judging from the data you have given, the trouble appears to be more apt to lie in a poorly fitting valve or valves, or a leak in the inlet manifold. A valve may leak in such a manner that at times it permits considerable of the compression to escape and at other times does not. When it does it will drive all mixture out of the manifold and carbureter issuing at the air inlet of the latter with a popping sound. For instance, cylinder number one has just fired, but on its compression stroke it has emptied the piping system so that cylinder number three, which is next in order, receives no charge and misses. It will then depend on whether the system recovers sufficiently in the interval to supply cylinder number two with enough of a charge to fire at full power. On the next round cylinder number three may inspire sufficient charge to fire, and then the compression of the explosion escaping through its leaky inlet valve will rob cylinder number two of its charge, thus causing the miss to apparently jump all over the engine in a most puzzling manner. Without further knowledge of the conditions, we should suggest an inspection of the valves to see if they require grinding in. Placing the ear close to the manifold where it is fastened to the cylinders will reveal whether there is any escape at those points.

More Light on Average Current Consumption.

Editor THE AUTOMOBILE:

[543.]—I fear that there is one point in particular little understood by the automobilist, and that is, that the battery consumption is the same at all speeds of the car. The general impression is that, as the spark is advanced or as the speed of the car increases, so does battery consumption. In a four-cylinder car, for instance, the time of contact for each cylinder is approximately 1-12 of a revolution. There being four contacts, the actual time of contact is one-third of the time run; so that if you drive your car for one hour it is equivalent to turning your switch on and letting it run for 20 minutes. For a two and one-cylinder car it would be practically one-half or one-fourth of the above, although the time of contact for each point is greater on a one and two-cylinder car than on a four. Is there any kind of solder and flux that can be used on aluminum?

CLARENCE T. JONES.

Columbia, S. C.

We very much fear that instead of the majority of autoists being misinformed on the point in question, your own knowledge is somewhat at fault. However, this will depend entirely upon the meaning you intend to convey by the expression "battery consumption." If you mean that the amount of current required to cause the spark to take place in the cylinder regardless of the time of occurrence or rapidity with which it occurs, due to the increased speed of the motor, remains the same, this is quite correct. In other words, neither advancing nor retarding the time of occurrence nor increasing the speed of the motor causes the latter to draw more current *per spark* from the battery. But it appears evident from the second paragraph of your letter that you wish to convey the impression that regardless of the speed of the motor the total amount of current drawn from

the battery is the same. As you say, the time of contact is approximately one-third of the time run, but in the case of a motor running at 1,500 r. p. m. contact is made twice as many times in the same period as if the motor were only turning over at 750 r. p. m. Your error lies in assuming that the period of contact is always equivalent to a constant contact, or closed circuit on the battery, for that length of time. If this were the case the dry cell would be worthless for automobile ignition. Turning on the switch and letting the current pass through the coil continuously for twenty minutes would be equivalent to considerably more than an hour's running of the motor. The impulses, or current discharges from the battery, are intermittent, and even though the motor be run at a very high speed they are not equivalent to the current consumed by the same coil on closed circuit. But the higher the speed the more frequent they are and the closer they approach to this value, hence the current consumption increases with the speed. The same amount of current is required *per spark*, but there are twice as many sparks in the instance cited. Just what proportion the increase in current consumption bears to the speed is, however, difficult to state. Novel's solders for aluminum are 100 parts tin to 5 parts lead or zinc; or 1,000 parts tin to 10 or 15 parts copper or nickel; no special flux is mentioned. Another formula consists of one part aluminum, one part 10 per cent. phosphor tin, 8 parts zinc, 32 parts tin, all by weight. With this Canada balsam is used as a flux. Considerable skill is required.

The Origin of the Term Limousine.

Editor THE AUTOMOBILE:

[544.]—Can you tell us anything about the origin of the term "limousine," used to designate a type of covered-in automobile? We should like to know how the word came to be applied, when it was first used, and whence it is derived. Can you supply us with this information? Thanking you in anticipation of a reply.

New York.

FUNK & WAGNALLS COMPANY.

The word "limousine" is of French origin and was originally applied to an open type of carriage body. A few years ago its significance was completely transformed, and it is now applied to any type of closed carriage which cannot be classed among such standard types as coupé, landaulet, omnibus, etc., whatever may be its form, dimensions, or number of places. The term "limousine" was first given to a new type of carriage designed by a Paris coachbuilder, a native of Limousin, one of the old French provinces.

A Time-honored Question Is Again Asked.

Editor THE AUTOMOBILE:

[545.]—Will you kindly tell me if there is any book published describing and telling how to care for a steam automobile? Also which is the freest from trouble and cheapest to operate, a gasoline or a steam automobile? I should judge the steamer would be best because it would be free from ignition troubles, but would like your opinion.

Freeport, N. Y.

LAWRENCE H. WRIGHT.

We do not know of any work that treats exclusively of the steam automobile and its management, but Holman's book includes chapters on the various types of steam cars extant as well as those of former days, and goes into detail regarding them as well as the care they require. It is generally conceded that in the advanced form in which it is now employed, steam is more free from minor troubles than the gasoline motor. As a well-known engineer has expressed the matter, "it takes two hours to find out what the trouble is with a gasoline machine and five minutes to remedy it, whereas only a glance is necessary to see what is wrong with the steam plant, but two hours are required to put it right." The question depends wholly on your own views in the matter; if you are familiar with steam practice you will probably like it better than gasoline, and *vice versa*. But reliability has been brought to such a high point that you run very little chance of disappointment in buying a standard car of either type. As to relative economy, this is a hard

question to answer; the steamer burns considerably more fuel per mile than the gasoline car of the same weight, the former only doing nine to twelve miles per gallon, while the latter covers fifteen to twenty-two or more. More lubricating oil is required for the gasoline machine, though in other respects there is probably no difference in the cost of maintenance.

Extent of the Gasoline Engine Demand.

Editor THE AUTOMOBILE:

[546.]—Will you kindly inform me where I can obtain information regarding the extent of the demand for gasoline engines? How many are made annually in the United States? To what extent are they used for farm work, for trucks, etc., for propelling boats other than launches, and on railways.

Toronto, Ont.

GEORGE DICKSON.

We doubt if any definite statistics on this subject are available. The number of gasoline engines of small powers annually produced in this country for farm and similar work is very large, mounting up into the thousands, and though to a much lesser extent, the same is probably true of small marine motors now being made for commercial purposes, such as fishing dories and the like. Their use on larger vessels or railways is at the present writing more in the experimental stage than otherwise. The International Harvester Company, Chicago, Ill., might be able to give you some idea of the number manufactured for farm work.

WINCHESTER, VA., FIRE DEPARTMENT WANTS.

Editor THE AUTOMOBILE:

[547.]—The general requirements upon which bids are invited by the Winchester fire department from manufacturers of an auto hose truck are that it shall be capable of carrying a load of about 2,500 pounds above its body weight. This load includes the fire hose, men, ladders, chemical tank, axes, picks and buckets. A gasoline engine is preferred, either water or air-cooled, to have gear of 16 to 20 miles per hour on levels, to be operated on vitrified brick and macadam streets, few grades and not over 10 per cent.; to carry 800 to 1,000 feet of regulation fire hose, one chemical tank with 200 feet of chemical hose, with basket to hold same, two hand chemical tanks, conveniently located, one extension ladder and one solid ladder, two picks (or pikes), two axes, six rubber buckets and a running board at the back for men.

Small deviation from the above is permissible, and all bids and correspondence should be addressed to the undersigned as soon as possible. Bids should be accompanied with complete specifications and blue-print or photograph if possible.

Winchester, Va.

J. FRANK EDDY & BROTHER.

A SUCCESSFUL HOME-MADE INSTALLATION.

Editor THE AUTOMOBILE:

[548.]—Noting the experience of your correspondent, letter No. 482, issue of November 29, in which he states that he always had trouble with the ignition system of his car and wishes to install a high-tension magneto, I will tell you of the success that I have had with the Apple dynamo, in order that others may benefit thereby. I fitted one of these little generators to an Elmore single-cylinder car nine months ago. There was a Pittsfield coil on the car already, and I did not disturb or alter it in any way. Nor did I use a storage battery. The dynamo is fitted with a three-inch friction pulley bearing directly against the flywheel of the engine, and when running up to speed delivers its output at 12 volts. I used two 6 c.p. lamps for the side lights and a tall light of the same size. The dynamo runs these three lights and sparks the engine at the same time. I use no storage cells nor dry battery, and have never had any trouble starting with the dynamo, nor has the outfit given me a moment's trouble since installing it. I trust this may help 482 as well as others in the same predicament.

Corisicana, Tex.

CLARENCE THOMAS (Auto Doctor).

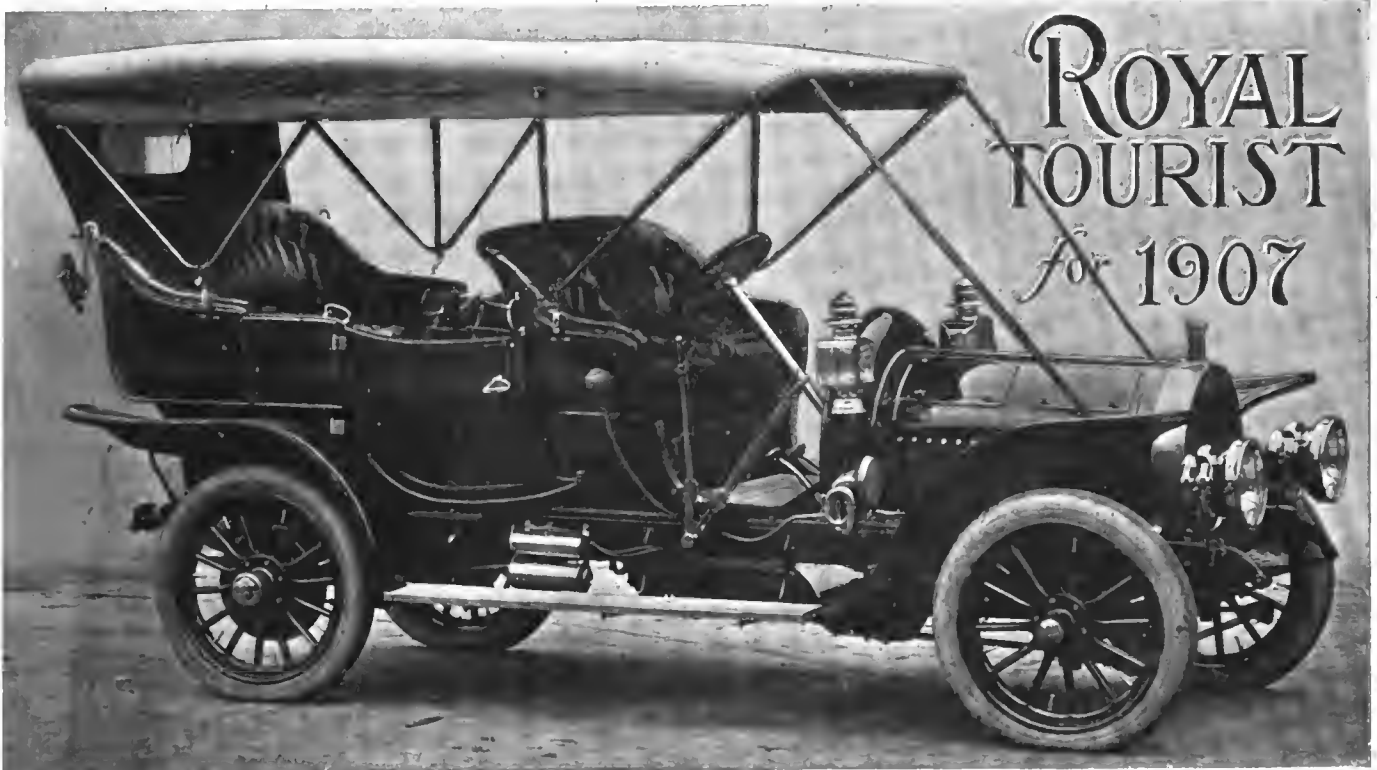
FROM AN OLDSMOBILER TO OLDSMOBILERS.

Editor THE AUTOMOBILE:

[549.]—With regard to letter No. 517, re heating of the 20-horsepower two-cylinder Olds touring car, I have found from experience that these cars heat more in cold weather than in hot, because there is not sufficient steam vent given to the radiator. If the hood is taken off the car, and then a quarter inch hole drilled in the back of the radiator close to the top, the water will circulate and steam pockets will not form in the cylinders.

London, Ont.

W. F. H.



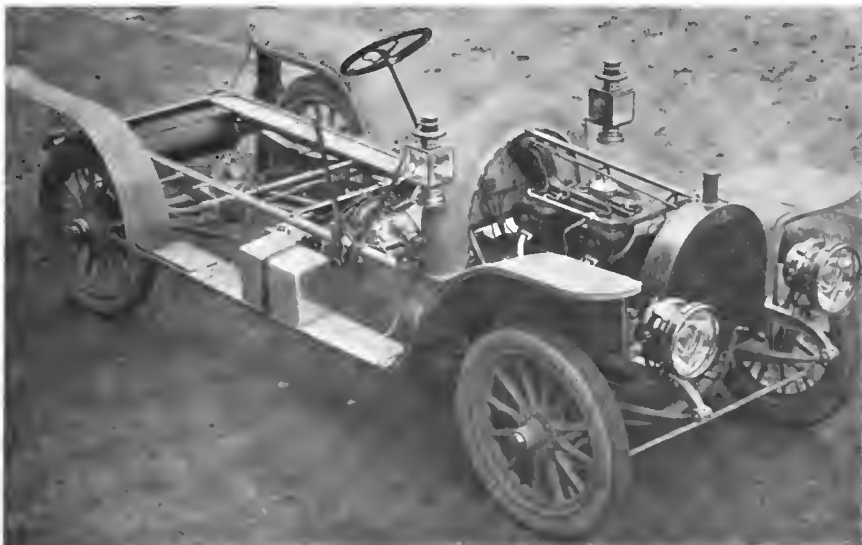
MODEL G, SERIES 2, ROYAL TOURIST, WITH KING OF BELGIANS BODY.

ADHERING steadfastly to the maxim about "doing one thing well," the builders of the Royal Tourist car have persistently stuck to the plan of specializing one type of chassis and one only, during all the time that this well-known car has been on the market. This is an age of specialization and the success that has followed the adoption of the plan of doing one thing well in the numerous lines in which specialists have scored, finds no exception in the case of the automobile. More than that, the builders of the Royal Tourist have appreciated the value of retaining the original outlines of a car which give it a distinctive character of its own and serve as a means of identification. For this reason not alone the outward appearance of the new model for the coming season but, at first glance, the motor, looks to be exactly the same as has always constituted a distinguishing feature of this car. This may seem to savor of extreme conservatism, but that this is not the case may best be judged from the close attention given to the matter of keeping abreast of modern design, as well as in adding exclusive improvements in the nature of detailed refinement to the motor and other parts of the chassis.

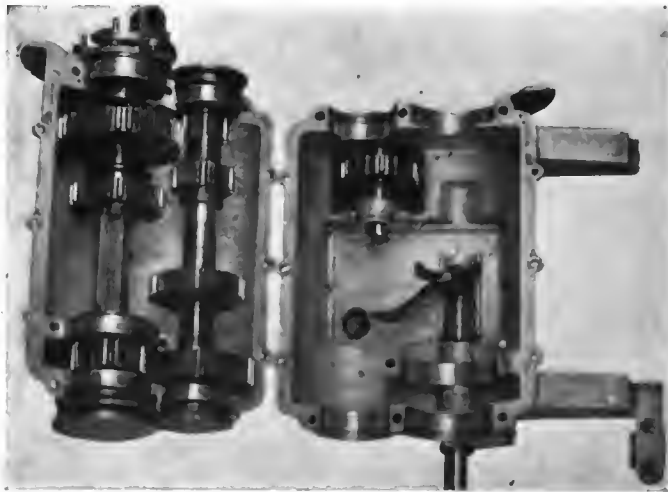
For instance, to summarize the improvements that distinguish the 1907 model from its predecessors, the motor, which is the four-cylinder vertical type, with cylinders cast in pairs measuring five by five and a half inches and developing 40 horsepower, originally designed by the Royal engineers, has

been provided with stuffing compression boxes on the valve lifters to prevent leakage of oil or grease out of the cam pockets. All joints in the crankcase are scraped to a perfectly flat and true surface, so that no oil can be forced out of the crankcase; the end bearings of the crankshaft are provided with return oil ducts, so that oil from these bearings does not escape but is returned to the crankcase and is utilized for the splash lubrication of the pistons and big ends of the connecting rods. The camshaft gears are entirely inclosed, as is also the gear driving the magneto. Simms-Bosch high-tension magneto is employed, provision being made on the motor in the shape of a high-tension switch, so that either accumulator and coil ignition or magneto ignition can be used with the same set of plugs. An arrangement has been provided on the fan pulley in order to permit of tightening the fan belt readily. The belt itself is flat and is made of non-stretching material. The wiring from the magneto has been

entirely inclosed and is so arranged that leakage of the current is practically impossible. Similar protection is given the wiring leading from the coil, avoiding the possibility of dirt accumulating under the latter. The motor and connecting rod bearings are of nickel-babbitt. For ignition a set of accumulators of greater capacity than were employed last year have been provided and the spark control has been arranged to work easier than was previously the case. An aluminum battery box



HOW THE CHASSIS LOOKS WHEN RELIEVED OF THE BODY.



TRANSMISSION EXPOSED, SHOWING DETAILS OF SLIDING GEAR.

of substantial construction has been provided to house this essential.

The crankcase vents, or "breathers," have been carried further up in order to prevent oil being sprayed about on the inside of the hood.

Similar provisions to guard against the loss of oil from any of the moving parts is noticeable in the oil retainers on the change-speed gear box. This is an excellent feature, as it is noticeable that many cars drop far more oil on the road than they employ in the actual work of lubrication—in fact, the loss is so excessive from this cause alone as to be hardly credible.

Carburetion and Lubrication.—As the result of experiments carried out during the past year a new type of carbureter has been adopted for which greatly reduced fuel consumption is claimed under ordinary conditions of running, without at the same time raising this unduly when the maximum speed of which the car is capable, is desired to be maintained. It is of the customary float-feed, automatic, compensating type, with a spring-controlled piston type of auxiliary air intake. It is placed at the level of the camshaft, on the same side as the magneto, the use of a common inlet valve pocket on each pair of cylinders simplifying the manifold.

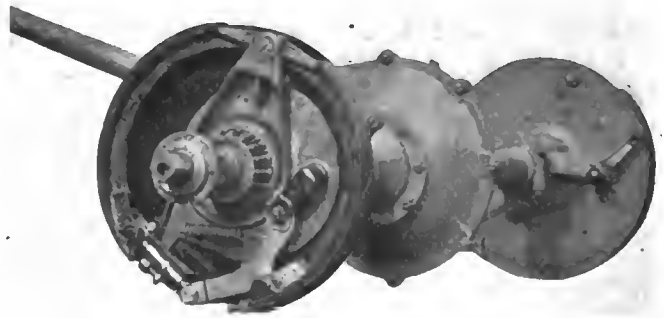
Lubrication is provided for by means of a McCord type of mechanical forced feed oiler, with independent leads to the principal bearings, the overflow dropping into the crankcase and aiding in maintaining the level in the latter for the splash lubrication of the pistons and connecting rod big ends, as already mentioned. The oiler itself is mounted directly on the dash, and with the addition of the coil box completes the fittings of the latter.



DASH, SHOWING THE FEATURES OF OPERATION.

which presents an unusually neat and unencumbered appearance. They are supported on brackets formed on the dash itself. The arrangement of the oiler on the dash is such that none of the oil pipes are exposed to view, which prevents any leakage of oil onto the footboards or floor of the car. Both the footboards and the floor of the car are made in such a manner that they will not lose their shape. They are covered with rubber of a better grade than is generally employed for the purpose, and provision is made for its easy renewal in case of wear. The muffler is of an improved type, placed transversely across the rear of the car, and is easily dismantled and taken apart for cleaning.

Transmission and Drive.—An improved form of clutch pedal, the metal surface of which is covered by a soft rubber pad, has been adopted. This reduces the danger of the foot slipping off the pedal, the rubber being easily replaced when worn so as to be no longer of service. The form of pedal and lever employed also avoid the necessity of cutting a large hole through the footboard, and give it a neater appearance. The clutch is a leather-faced aluminum cone of the standard type, that has always been a feature of Royal Tourist construction. Between it and the gear box a universal joint is placed, while there are two on the propeller shaft, all of them being made of forgings of a special grade of steel, which gives them about double the strength, without an increase in weight over those formerly employed. The joint at the rear of the gear box is readily accessible,



REAR AXLE, SHOWING BRAKE MECHANISM.

and is made in such a manner that it is constantly lubricated at every point.

The change-speed gear-box is of the straight or progressive sliding type, giving three speeds forward. A novel and cleverly worked out arrangement is provided for shifting the gears, preventing to a very great extent the clashing or rubbing of the pinions while changing. This gear-shifting device is mounted on top of the gear box itself, and is connected to the gear-shifting lever by means of a train of gears, thus making the movement positive. All the pinions, as well as the shafts, are of chrome nickel steel, and the same material is employed in propeller and rear live axle shafts.

Running Gear and Suspension.—The frame has been made of a wider and deeper channel section, and has been lengthened by six inches over that employed last year, beside which the strength of the frame has been increased by about 50 per cent., owing to the use of a much higher grade of steel. The front axle is tubular, of dropped shape, and has also been improved in this respect. Steering arms and steering knuckles on the front axle have been increased in weight, a higher grade of nickel steel being used in their construction as well. The axle bed is made of nickel steel tubing, increasing the strength in about the same ratio as the steering arms, which are approximately twice as strong as those previously used. Both the front hubs and the front wheel bearings have been designed to carry a heavier load, the former having been increased in diameter. The steering gear has been improved in detail, with a view to overcoming wear and its resulting lost motion in as far as possible.



UNIVERSAL JOINT, BRAKE, AND RATCHET SPRAG.

The tubing used in the rear axle is of nickel steel, while the rear axle differential housing is made of a drop forging of special high grade steel. The large casing to which the torsion rod is attached has been heavily reinforced, in order to guard against any possibility of deformation. The brakes consist of one of the external contracting type placed on the rear of the transmission. It is operated by the pedal, and is for running service. The drum is of large diameter, and has a wide face, the brake shoes being readily adjustable, as well as detachable for replacement when necessary. In addition, this brake carries a ratchet sprag drum and pawl designed to be brought into action from the driver's seat. The strut rods to the frame from the rear axle have been made heavier in every way, and the same is true of the torsion rod running from the rear axle to the torsion buffer. This is made of a special grade of steel, and is twice as strong as the standard formerly adopted for this element.



HOW A ROYAL TOURIST LOOKS FROM THE FRONT.

This rod is drawn into the rear axle casing through a taper hole, making it impossible for the strain to gradually cause the rod to work loose. The rear brakes are of the internal expanding type, working on drums bolted to the driving wheels, and have been designed with such liberal proportions as to enable the rear wheels to be locked with the ordinary pressure on the hand lever, which has been improved by making it of the pull-up type, instead of requiring to be pushed forward to apply it. This is an apparently minor and trivial improvement in itself, but it demonstrates to what an extent attention has been devoted to improving the car in every detail. Some designers object to this method of application, on the ground that it spoils the appearance of the car by keeping this lever always in a forward position instead of vertically when at rest, as is the case in many instances. The rear brake shoes are also readily removable, to permit of replacing the liners in case of excessive wear.

For suspension, semi-elliptic springs of ample proportions are used on both front and rear, the spring clips employed on both axles being of an improved type, designed especially to hold the spring firmly on its seat, with a view to avoiding the possibility of the spring being loosened through constant bending, resulting sooner or later in its breaking. The running boards are brass bound all around, making them very neat in appearance. A full twelve inches has been added to the length of the tonneau, making it that much longer than any body previously fitted to these cars. This permits of the use of two extra folding seats, which provide ample accommodation for the average sized person, but which fold into very small compass when not in use, the extra length giving plenty of foot room to all the occupants of the tonneau. A coat rail is provided on the rear of the front seat, and suitable handles have been placed on the front seat and side of the body in order to make it unnecessary to put any weight on the side door when entering or leaving the car. The hinges of the doors have also been made heavier and of better material. The wheelbase has also been increased by four inches, making the car that much longer than its predecessor. In order to thoroughly protect every part of the mechanism from flying mud and water, pans extending rearward from the front end of the motor to the rear of the transmission case have been provided. They are bound with leather to prevent rattling, and are made fast to the frame with a number of wing nuts, so as to be readily removable for cleaning. They are so arranged that adjustments can be made on any part of the car without the necessity of disturbing the pans. No pains have been spared to make the upholstery and finish representative in every respect of the highest stage of the carriage maker's art. The mudguards have been improved by the addition of a deflecting strip running around the outside, throwing mud and water downward and stiffening the guard itself. The makers of the Royal Tourist operate their own body factory, which is one of the most complete in the country. Any body equipment that the purchaser desires can be furnished on the chassis described above, known as Model G, Series 2. In addition to the semi-oval outline of radiator that has always been a distinguishing mark of this car, a further means of identification has been added in the elongation of the filler vent.

A curious motor wheel is reported as giving satisfaction in England. The tire is compacted of a peculiarly tanned and waterproofed pigskin, dovetailed into a rim. It is therefore a solid tire; the leather wears on its edges, and is said to be almost like horn in hardness. Road shocks are absorbed by the hub, which appears to be a box full of small steel balls surrounding the axle. These slip so readily under sudden impact that the bearing is almost liquid in its mobility, and, unlike a spring device, it gives no reaction. Just how the wheel maintains a center about the axle with the balls free enough to allow of eccentricity does not appear. Apparently the play is limited by tubes through which the driving bolts pass freely, but limit the maximum up-and-down movement. Presumably when running the whole matter is self-adjusting.

INCREASING THE DOSE IS APT TO BE DANGEROUS

PROCEEDING on the principle that what is beneficial in small doses is correspondingly more so as the quantity is increased, many autoists are prone to resort to the use of additional cells of battery when, after considerable tinkering, they have been unable to get the coils in proper working condition. Just as powerful poisons may be taken in minute doses with good results and an excessive quantity seldom fails to prove fatal, so an excess of current above the limit for which the particular make of coil has been designed, is more apt to bring about its ruin than to restore the ignition system as a whole to that efficient state of working which is the object of the investigator in applying the remedy. Among the not very lengthy list of "don'ts" which the manufacturer of coils has compiled for the benefits of the users of his apparatus, this particular "don't" is written large. Yet, one after another, autoists will continue to travel the same road toward that expensive goal of experience, and in the majority of instances without realizing what they have done to end the working days of their coils until the secondary windings of the latter have been rehabilitated.

Despite the fact that the "innards" of a coil are regarded very much in the light of a mystery by the average man for the simple reason that they are never exposed to the public gaze, the why and wherefore of this particular reason for destroying the coil's usefulness is not difficult to understand. Technically speaking, the induction coil such as is used on nine cars out of ten is a step-up transformer—in other words, if a current of low tension such as is produced by a dry battery or a set of accumulators, or a small direct-current dynamo, is passed through its coarse or primary winding, a current of high tension or voltage will be produced in the fine or secondary winding. And by fine in this case is meant exceedingly fine, for the secondary windings of high grade coils are composed of 36 gauge cotton or silk-covered copper wire, and this, even with its silk insulation, is of scarcely greater cross section than a horse hair and is twice as delicate. It will be evident that the current-carrying capacity of such a wire is almost infinitesimal, and that an excessive increase over its rating, as calculated by the maker of the coil, is bound to either burn the wire or break down the resistance between the layers.

What the Addition of an Extra Cell Means.

"But," says the average automobilist, "how can the addition of one cell be considered excessive?" In the case of a dry cell this means but 1.1-2 volts, and of an accumulator but two volts. Such a query is naturally indicative of a lack of knowledge of the fundamental principle upon which the induction coil or transformer is based. This is the fact that the potential or voltage of the induced current is dependent, not alone on the proportion that the number of turns in the secondary winding bears to that in the coarse or primary winding, but also on the voltage of the current supplied to the latter. For instance, on the average coil for automobile use, the coarse or primary winding which is placed next to the iron core consists of two or three layers of No. 14 or 16 B. & S. gauge insulated copper wire. Assuming that in those layers there are fifty turns of wire round the core, and that in the fine or secondary winding there are 10,000 turns, then a current sent through this primary winding at a potential of six volts—that generally adopted for ignition purposes—would result in the stepping up of this pressure to one of 12,000 volts. These figures are naturally not those actually adopted by coil makers, but are merely assumed for the purposes of illustration. In the case supposed above, where the autoist who has decided that more battery power is the only remedy that will produce satisfactory ignition, adds another cell of storage battery to his ignition set, this merely raises its voltage to 8, instead of 6, but the extra 2 volts, when they have passed through the multi-

plying process of the turns of the secondary winding, mean an increase of approximately 4,000 volts, taking the ratio between the two windings as 1 to 200.

Why Extra Cells Endanger the Coil's Efficiency.

From this it will be at once apparent that the simple addition of an extra cell involves far more than an increase of two volts at the primary. It must further be borne in mind that insulation is the prime requisite of the secondary winding of the induction coil, and that when this is calculated to stand the potential resulting from passing six volts through the primary any increase in the latter is bound to overstep the limit placed by the maker on the capacity of the insulation of the fine windings to withstand the tendency to jump between windings or between adjacent layers. Just as a chain is only as strong as its weakest link, so the coil is no stronger than that part of it which presents the least resistance to the current, and in such a number of turns of fine wire there are bound to be numerous weak points, despite the greatest care exercised in the winding and insulation.

The danger is not merely in the number of cells employed, but in the voltage. For instance, four dry cells when new give approximately 6 volts, but, when nearing the end of their life, drop off somewhat, and it is then safe to add another, and the same is true of accumulators, except that when an accumulator has already dropped below a safe voltage it is not a good plan to couple two sets in an attempt to raise the combined voltage to that required. If the voltage, tested when running, does not exceed 1.7, further use of the cells in any way will damage them. They should be recharged without delay, and it is only by recharging at frequent intervals that proper service can be obtained from an accumulator. It is not to be denied, however, that adding an extra cell, and thus raising the voltage to 8 or more, will sometimes prove effective by improving the ignition to an extent that permits of running the car where this was not possible with the original number. But it only goes to show that there is a defect in some part of the system, which, if corrected, would do away with the necessity of raising the voltage. In the meantime the extra strain imposed upon the coil is apt to puncture the insulation, reducing the efficiency of the coil to a point where it is practically useless by reason of the windings that have been cut out, or ruin it entirely.

SOAP AS A FIRST AID TO THE INJURED.

Injured in this case does not necessarily mean the autoist himself, unless the liberal coating that is said to be best described "as matter out of place" may be considered an injury. But vibration and excessive jolting frequently bring about a leak in the unions of the fuel pipe that no amount of tightening suffices to eliminate. No matter how slight the drip, if it be constant, it means that fuel is being wasted faster than the engine is using it, and where there is any question as to the supply holding out a repair is imperative. The simplest, as well as the most efficient, way to accomplish this is to shut off the fuel at the tank, or at any point between the tank and the union to be operated upon. Unscrew the latter, wipe the threads, clean and smear them liberally with soap. A piece of soap dragged across the threads will serve to fill them, which is the object desired. Other substances than can be used to equal advantage for this purpose are graphite, stiff tallow, or red lead mixed with glycerine. In setting up piping it is customary to use red lead mixed with linseed oil, but as this sets with a cement-like hardness, its employment on the car is hardly to be recommended. Failing any of these materials, a tight wrapping of adhesive tape may serve as a temporary makeshift that will prevent further loss of the precious fluid.



BY
FRANCIS MILTOUN

THERE are three things demanded by touring automobilists: good accommodation for himself in the way of beds and baths (or at least hot water and plenty of it, hitherto a rarity in France), a good table (which need not be a country imitation of a Paris table d'hôte), and good garage accommodation for his machine. By this latter something more is meant than a backyard, uncovered shack where hens and chickens roost and all the débris of the establishment is thrown helter-skelter. France possesses, in general, all the hotel requirements of the automobilist en tour. This is not saying but that there are deficiencies here and there; but the country landlord in France tumbled to the fact, at a very early period, that there was a new class of traffic to be catered to and the accommodation that it demanded was something different from that which had been current before. Old court-yard inns, which had been dull and dreamy since coaching-days, were refurbished up, the old stables were torn down or rearranged to give plenty of light and air, and a clean, dry place was furnished where the lordly touring car or the eight-horse runabout of the really happy tourist could find shelter and *tout ce qu'il faut*.

The *garçon d'écurie* of other days comes to know the requirements of automobilists, and instead of filling nose-bags for horses he fetches and carries water and *essence* and gives you a hand here and there to speed you on your way—and doesn't expect a franc tip for every pail of water that he brings you, either. He'll take five sous and be thankful.

With the hotel accommodation itself the *patron* has become used to serving meals out of hours—it's astonishing how frequently one is a half an hour or an hour late for déjeuner when touring, not of course because anything was wrong with the automobile. Oh, nol but because one missed the road. Mostly the hotel *patron*, who often in the country-side of France is *chef* as well, sticks to his old system of feeding you the *plats* of the *pays*, but occasionally, in the large towns, as at Arles in the Bouches du Rhône, at Nantes in the Loire-Inférieure, or even at Rouen in Normandy, he plans unwisely and gives the same sort of fare that is known variously as a "table d'hôte" and "cuisine française" in Vienna, San Francisco, New York, or London. This is where he makes a mistake, and though he may catch a certain amount of quick-touring strangers who think their only safety lies in patronizing a "swell hotel" he is not as well advertised by his loving friends as the *patron* of the little inn around the corner whose clientèle is largely of the *commis-voyageur* class, and those travelers and tourists who know that his trail is that which leads to good cooking, eating, and drinking.

The general equipment of the French hotel before the advent

of the touring automobilist, and before "le tourisme" became popular in France was a dismal affair, and its only spontaneous gaiety was that awakened by its ample board with the good things of the table—food and drink alike—heaped high and served with a liberality and a local flavor which gave a new zest to each meal taken a dozen kilometers from where the last was eaten.

Evolution of the French Hotel.

Things don't move so slowly in France as is often supposed, though in the hotel line the high, coffin-like beds, with their overhung baldequins

and stuffy window hangings, have been slow enough in disappearing in some parts. Until very recently, and now they are not many, there has been an utter absence of a sitting, writing or reading-room in the country hotel in France. In the days of the poste-chaise and the malle-post travelers were of an exclusive and aristocratic class, and wealthy withal—the poor folk didn't travel, or if they did a "loge à pied" was good enough for them, and they furnished their own provender.

The hotel travelers had their own special apartments where they lived and lodged and ate apart, much as they did in their own homes. They had no need of a public sitting-room, and they summoned the patron to them to present his bill in person, and in general put on much side and made themselves conspicuous. For this reason no public rooms, save the *salle à manger*, have until recently been found in provincial hotels.

With no accessible or comfortable room in which to sit or write, most travelers in France stifle or freeze themselves, according to the season, in their heavily-curtained, brick or tiled-floored bedrooms or hang wearily about the corridors waiting for the hour of table-d'hôte at 7 or 7:30 o'clock. The *commis-voyageur* or the French commercial traveler, knows better how to utilize his time. He deposits his bags and traps in the hotel when he has finished "*les affaires*" and goes to a brilliantly-lighted, warm, comfortable café, which may or may not be a dependency of the hotel. Here he writes his letters, drinks his *apéritif* (his appetizer, which, by the way, is far behind a cocktail) of whatever of the sticky, varnishy concoctions he affects—a "*Pernod*," an "*Amer*," or a "*Dubonnet*," and is happy and genial through all of it and ready for his dinner when the time comes.

The last decade has brought many changes in the French provincial hotel. The bedrooms are considerably less stuffy than they used to be (this in summer, for they are no less frigid in winter). The heavy repp curtains at the windows are disappearing and hot water comes—when you order it—in sufficient quantity to at least remove the surface dirt of a dusty two hundred kilometers. Formerly you got a shaving mug full, and not very hot at that. Yes, things are looking up in the hotel line in France, and the automobile is the reason for it.

The above is simply a fair, unvarnished résumé of the state of affairs in the majority of small towns in



THE OLD GARÇON D'ECURIE.

France, where, by chance, one may be landed for the night; towns like Conches in Normandy, Noyon in Picardy, Agde in Pyrénées-Orientales or Gien on the upper Loire. In the neighboring towns, with no more pretense to importance often than themselves, the wave of progress has broken with much more force. At Moulins, on the Loire, in the Hôtel du Dauphin, with about all the modern improvements one can well add to an old fabric. The character and old-time charm is still there, but there is steam-heat and electricity everywhere, and a real bathroom with hot and cold running water. At Perpignan, a near neighbor of Agde, almost the same thing is true at the Hotel de la Poste, and the bedrooms are all "*chambres hygiéniques*"—which means that they have been installed according to the formula of the Touring Club de France, the most famous institution of the world for having the interests of tourists and the betterment of their accommodation at heart.

How the French Hotel Proprietor Is Being Educated.

The Touring Club de France has done a great thing in advocating the "*chambre hygiénique*," though with just how much favor it will be received by all classes of travelers is a question. Many will not care as to whether it is clean, healthful and bright or not, the *commis-voyageur* does not seem to have any very pronounced views on the subject; and most French travelers sleep with their windows and shutters tightly closed; thus the element of light and air is often not a consideration. Others will liken the bareness and plainness of these rooms to a prison-cell, or at all events to a cubicle in a hospital; but even this latter must be admitted to have some considerable advantages as a place of healthful repose. This, after all, is what one wants, or ought to want, and accordingly ought to be willing to forego something to get.

For twelve years the Touring Club de France has been struggling towards its ideal—the betterment of the accommodation offered all classes of travelers, and the universal adoption of the "*chambre hygiénique*" has been one of its fondest dreams.

The "*chambre hygiénique*" has white lacquered walls, severely plain "bent-wood" furniture and a brass or iron bedstead.

Throughout there is a lack of ornamentation which does not tend to a gracious home-like aspect, though it is a pity that the sleeping rooms of more Anglo-Saxon homes were not furnished on these simple lines rather than being crowded with the trumpery bric-a-brac, Japanese umbrellas and pampas plumes that one usually finds.

The Touring Club de France publishes explicit detailed directions as to how this novelty may be installed and distributes the information gratuitously to inn-keepers throughout the land. Furthermore, in many cases, it gives even more substantial assistance with regard to the outfitting. The ceilings, like the walls, are lacquered, and there are no mouldings or nobby gas fixtures to catch and harbor dust. The curtains at the windows are washable and so is the *descente de lit*, the little strip of carpet which covers the tiled floor in front of the bed. The *table-de-nuit* is a new idea of a useful article of furniture, and it, too, and the washstand, taboo the Eastlake, spindly-railed decorations under which a suffering people labored under Louis Philippe, Queen Victoria and Andy Johnson.

All this does not preclude an artistic ensemble by any means, though it takes some considerable influence to move the masses on such points, even in France, for with all their natural artistic sense the French are firm adherents of such conventions as have been instilled into them since the horse-hair and plush horrors of the Citizen-King.

The *cheminée*, or fireplace, plays a grand rôle in the ventilation of a sleeping apartment, and where one exists, says the Touring Club formula, it should be allowed to perform the functions of drawing a *courant d'air* from an open window. The table tops, etc., throughout are of marble, real or artificial, and all bed hangings are abolished.

As for the French beds themselves something new was manifestly demanded to replace the stuffy upholsterings and cabinet

work of those abominations which were the despair of the lover of airiness and cleanliness. An iron and brass model of a bedstead has been approved by the T. C. F. It has no ridges, ledges or crevices to harbor dust and things. In France seldom, if ever, were the beds unclean, except for the soil incident to ages; but the thick stuffed *paille* of feathers, or more often wool, was certainly not hygiénique, no matter how frequently it was turned and pounded into a semblance of fluffiness.

Something soft to recline upon was necessary, no doubt, but an animal product is about the worst that could have been adopted. Cotton-waste, pine-shavings, corn-husks and sea-weed are all in use in the beds of France and possibly some sort of a combination of these things is what is required, but a sweeping change is due to be made from general existing conditions.

Again the Touring Club suggests that the *paille* and mattress be enveloped in a white or ecru sack, or covering, which may be readily lifted and washed. The bed-clothes, too, comport with the march of progress, and no one who cares a whit for his health and comfort thinks of sleeping under a heavy padded quilt, such as our grandmothers and great-grandmothers used to delight in making. What awful and depressing things they were, to be sure!

Now the up-to-date *hotelier* in France has his *couvertures*, light, warm and washable, and the great eider-down puffs (which the French, by some extraordinary process of reasoning, call "*couvres-pieds américains*") are covered with a slip which is also washable, instead of a Japanese silk skin which soon becomes torn and, what is left of it, distinctly greasy.

The size of the wash-basin, and its accompanying water-jug even, is prescribed. This is a move in the right direction. The chocolate sets sold by department stores, at forty-nine cents for a little pitcher, a great cup and a tiny sugar bowl, are a very good illustration of what the appurtenances of a French hotel washstand used to be.

As for the cleaning of a sleeping room such as this, it is a very simple matter. No more general turnings out, such as the English maid-of-all-work delights in, if only for the discomfort it causes others; no more of the spring cleanings of New England housewives, which are equally disconcerting; a simple washing off by soap and scrubbing brush, and a drying off with a cloth is all that is required. An able seaman, who is usually very well versed in this sort of scrubbing, could do it quite as well as any *bonne à tout faire* that ever wielded a broom or a mop, though it must not be forgotten that the *femme de chambre* in France to-day is usually a *garçon de chambre*.

Since it is pleasanter to say good than ill of things, one may now turn to the glad side of the country hotels of France and be thankful, at any rate, that nothing quite so foul or disgusting is ever seen in a French inn, as the supply of carpet slippers which the English inn-keeper keeps on hand for the general use of the none too fastidious English bagman who patronizes his establishment and drinks whiskey and soda with his meals. The French *commis-voyageur* may have his bad habits (straining his soup through his whiskers and guzzling his food aloud are two of them), but nothing that one sees in full view is quite as bad as that almost universal custom of his English confrère.

The foregoing outline has been made as brief as possible, and that a considerable effort has been made on the part of concurring hotel keepers in France to meet modern exigencies at least half way is the best proof that the fast-growing automobile clientele is not being ignored. As the report of the Touring Club de France has it:

"*La propreté de la chambre et du lit est le premier et le minimum des desiderata auxquels nous avons droit.*" (Cleanliness of the room and the bed is the first and the minimum desiderata to which we have a right.)

The Touring Club de France has not stopped there: it has furnished freely and gratuitously plans and projects for the installation of modern sanitary arrangements, and has even been known to establish and pay for a model accessory of this sort where it was badly needed and where it was thought to be a

good example to others. All these innovations—practically all brought about by the advent of the automobile—scattered though they be all up and down France, have had an undeniable influence for the better on the hotel industry here. Given two hotels, one with these modernities and the other without, and the automobilist and other travelers, too, will patronize the former if they only know which is which.

Twelve hundred hotels all over "la belle France" have given adherence to these new ideas of the Touring Club by taking its admonitions to heart. All this is set out in the Touring Club's "Annuaire" or Hotel List with great completeness, and the Automobile Club de France in its "Annuaire de Route" gives similar information, rather less completely, though rather ingeniously. Here one finds a little silhouetted knife and fork and an old-fashioned bedstead, indicating a good table and good beds. A good idea this which all guide-book makers might adopt, with a still further elaboration, to the benefit of their clientèle.

French Guide Books Give Useful Hints.

The Guide-Michelin, issued by the great pneumatic tire manufacturers of Clermont-Ferrand, do the thing with considerably more completeness, all by means of little typographical signs and indices—which look Greek to the uninitiated, but which are a veritable way-about-courier to

and S. de B. (salle de bains) a bathroom, and W. C. the obvious thing, with this in addition, when it deserves it, *bien tenu et perfectionné dernièrement*—this really means something in France.

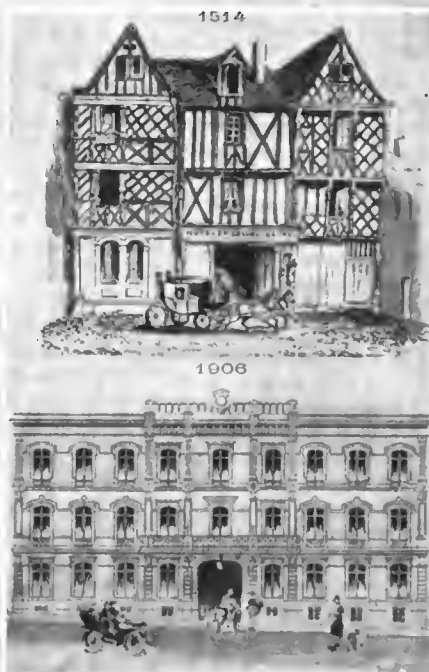
The initials T. C. F., A. C. F. and A. G. A. indicate that the house is affiliated or endorsed by the Touring Club de France, the Automobile Club de France, or the Association Générale Automobile, and if you are a member of the first-named (write to the headquarters, 65 Avenue de la Grande-Armée, Paris, for particulars as to membership, the fees of which are nominal) as like as not you get a discount of ten per cent. from your bill for having favored the hotel with your patronage. This is enough to pay one's tips.

One notes the panels of these great touring organizations all over France, usually posted prominently on the façade of the hotel, and with these as a landmark, and any of the three guides or route books before mentioned to place their location, one is bound to know beforehand just what one may expect to find and what one is likely to have to pay for it.

There are three classes of country hotels in France, not counting the purely resort hotels, patronized by the automobilist en tour; the frankly country, market town hotel, such as you find at St. Remy-en-Provence, Auray, in Brittany, or Louviers, in Normandy, where you literally stable your machine along with the market wagons, country



IN PROVENCE.



THE CHEVAL BLANC, ANGERS.
TYPES OF FRENCH COUNTRY INNS.



ON THE SEINE.

those who know their real meaning. One, two or three stars (* ** ***) shows that the price which one may expect to pay per day (*tout compris*) is nine or less, eleven, or thirteen or more francs. If wine is not included in the price (and very seldom is it not) the letters *v. n. c.* (*vin non compris*) appear. This is all one needs to know as to prices. Now for the rest: A little square black spot means a dark room for photographers, a figure 6, 8 or 10 in a little square indicates that there is ample garage accommodation for the prescribed number of automobiles, a sort of capital U that there is a fosse or inspection pit, and "Ess" and "H" mean that *essence* and *huile* can be had on the premises (gasoline and oil). These latter commodities will cost you something more than they will at the grocer's around the corner (don't forget that, Mr. Tourist, if you are running a high-powered car with a voracious appetite). On the other hand, the hotel proprietor expects you to "buy something" to help him out on the expenses of the up-keep of his free garage. Buy ten litres of *essence*, if you like, or a two litre bidon of *huile*; he will be satisfied. Finally a jagged electric-spark-looking sort of a mark indicates that accumulators may be charged on the premises.

They go further than this, too, when it comes to the hotel accommodation itself. Ch. hyg. means "*chambres hygiéniques*,"

carts and what not. Then there are the hotels of the *sous-préfectures*, like Evreux, Bourges or Poitiers, where, if they are somewhat pompous, the hotels are still countrified and have not a suspicion of Paris about them, either with respect to their cuisine or their appointments.

Then there are the *grands hôtels* of the cities, such as Marseilles, Bordeaux or Nantes, where one pays from twelve to fifteen francs a day—*v. n. c.* in most cases.

Finally there are the "resort hotels" of Trouville, Biarritz, Nice or Aix-les-Bains, which are ultra-everything and where one pays anything one likes, wholly unattractive, so far as local color or character goes, either in their appointments or their cooking, being rank imitations of the real thing at Paris. *Vin* is never *compris* and you pay dear for what you do buy, and a franc and a quarter or a franc and a half for a bottle of *vichy* which you buy elsewhere for eighty centimes.

The two first-mentioned classes of establishments are the *vrais hôtels du pays* and those of the last class are as like as two peas in a pod and frankly reminiscent of the Ritz in Paris, the Carleton in London or the latest skyscraping palace hotel of New York, at least so far as go the conventionalities, fripperies and the deadly staleness of full-dress dinners and teas on the terrace or in the palm room.

The best provincial hotel in France, all things considered, is the Cheval Blanc at Angers, a successor to a sixteenth century inn on the same site, with some modernities, but still possessed of a character which is distinguished, a comfort which is remarkable, and an excellence of cuisine which is a marvel.

Angers is a little beyond the beaten track of tourists in the chateaux country, but it is worth running down to just to put in a day at the Cheval Blanc and see how well a provincial hotel can be run and how wholly attractive it can be. Saumur, near by, runs Angers a close second with its Hôtel Budan. Champagne's only real rival comes from Saumur, and when you have stabled your automobile in the really luxurious little paved courtyard garage you will enjoy a bottle of it with your dinner. It won't cost you over five or six francs for the best.

Tours, in the heart of the châteaux country, has a magnificent establishment, the Hôtel de l'Univers, whose proprietor is progressive enough to keep a fleet of automobiles for hire to tourists who do not bring their own. The

Hôtel de l'Univers is to all intents and purposes a "resort hotel," though Tours is neither a watering place, a mountain resort or a gambling hell. This classification, however, puts the hotel out of the category of French provincial hotels. Its garage is quite the most palatial thing of its kind to be found in France and appears to have accommodation for half a hundred machines. The feeding here is not as good as the rest; one can do much better at a little *commis-voyageur* hotel (du Croissant), on a back street opposite the post-office; but not catering especially for automobilists, they cannot house more than a couple at a time, and one often has to board the machine out for the night.

Nantes, at the embouchure of the Loire, a one-time dignified provincial capital, was praised by a century-old traveler for its Hôtel de France. The hotel is still there and the date over its portal is written large—1796—but within a twelvemonth it has fallen from its previous character and become a pseudo de luxe hotel with a restaurant where you—being an automobilist—are supposed to eat and pay fifteen prices for everything. There is a "lounge" and no end of gold-braided lackeys hanging around doing nothing but getting in your way. Nantes needs nothing of this kind; it is not a city of a million inhabitants, and is not a resort, but merely a busy port and manufacturing ville, enterprising, substantial and wealthy, no doubt; but there is, as before said, no call for such a fell blow as has spoiled the Hôtel de France of other days.

(To be continued.)

FRENCH MARINE MOTOR KEROSENE CONTEST.

The competition organized by the Automobile Club of France for marine motors using kerosene as fuel, and intended for service in the navy, has just been brought to a close. The motor Cazes gained first prize, and will be bought by the Government. The Mietz & Weiss motor will also enter the navy. A new competition will shortly be organized by the Minister of Marine for kerosene motors, and next year an important competition for kerosene-driven motor boats to be used in protecting fishing craft will be held.

Automobile instruction will be specialized in the new *Arts et Métiers* college to be built near Paris. A three-year course will provide instruction in various arts and trades; the fourth year's course will be devoted especially to automobile construction and electricity. The college will cost \$1,200,000.

THE AUTOMOBILE CALENDAR. AMERICAN.

Shows.

- Jan. 28-Feb. 2.—Washington (D. C.) Automobile Show, Dupont Garage, Washington Automobile Dealers' Ass'n.
 Feb. 2-9.....—Chicago Automobile Show, Coliseum and First Regiment Armory. S. A. Miles, manager, 7 E. 42d Street, New York City.
 Feb. 11-16.....—Detroit, Mich., Sixth Annual Automobile Show, Light Guard Armory, Tri-State Automobile and Sporting Goods Ass'n. E. E. McMasters, mgr.
 Feb. 18-23.....—Fifth Annual Automobile Show, Buffalo, Convention Hall. D. H. Lewis, manager, Teck Building.
 Feb. 18-23.....—Cleveland Automobile Show, Cleveland Automobile Trade Association.
 Feb.—San Francisco, Golden Gate Park Skating Rink. Automobile Show. Dealers' Association and Automobile Club of California.
 Feb. 25-Mar. 2.—Portland, Me., Second Annual Automobile and Power Boat Show, The Auditorium.
 March 2-9.....—Chicago, Second Annual Power Boat Show, Seventh Regiment Armory. W. C. Andrews, manager, 19 E. Huron street.
 March 2-9.....—Automobile Show. First Regiment Armory. Minneapolis Automobile Dealers' Association.
 March 4-10.....—Kansas City, Mo., First Annual Automobile Show, Convention Hall. Frank L. Woodward, manager, Willis Wood Theatre Building.
 March 9-16.....—Boston Automobile Show, Mechanics' Hall and Horticultural Hall, Boston Automobile Dealers' Association. Chester I. Campbell, manager.
 March 13-16....—Second Annual Automobile Show, Omaha Dealers' Association. Auditorium Bldg. T. Gillian, mgr.
 March 18-23....—Providence (R. I.) Automobile and Power Boat Show, Infantry Hall. F. M. Prescott, manager.
 April 1-6.....—St. Louis, Mo., Automobile Show, Jai Alai Building, St. Louis Automobile Dealers' Association.
 April 6-13.....—Montreal, Canada, Second International Automobile and Sportsman's Exhibition. R. M. Jaffray, manager, 309 W. Notre Dame street.
 April 8-13.....—Pittsburg, Pa., First Annual Show of the Pittsburg Automobile Dealers' Association, Duquesne Garden.

Race Meets, Hill Climbs, etc.

- Jan. 22-26.....—Ormond-Daytona (Florida) International Race Meet, Florida East Coast Automobile Association.

Motor Boat Races.

- Jan. 29-Feb. 1.—Palm Beach, Fla., Annual Races of the Palm Beach Power Boat Association.
 Sept. 2-6.....—Jamestown (Va.) Exposition, Motor Boat Races.

FOREIGN.

Shows.

- Jan. 25-Feb. 2.—Liverpool Motor Show, Tournament Hall.
 Feb. 1-9.....—London, Crystal Palace Motor Show.
 Feb. 16.....—Automobile Show, at Turin, Italy.
 March 7-16.....—London, Olympia Commercial Vehicle and Motor Boat Show.
 April 6-13.....—London, Agricultural Hall Motor Show.
 May 1-15.....—Madrid, Spain, Automobile Exhibition, Palace of Fine Arts, Royal Automobile Club of Madrid.
 May 15-26.....—Third Annual Swiss Automobile Show, Zurich.

Race Meets, Hill Climbs, etc.

- Feb. 23-27.....—Volturette Contest, Automobile Club of Italy.
 March 20-27....—Nice (France) Automobile Week.
 April 1-15.....—Spring Wheel Competition.
 April 21.....—Targa Florio Tour (Sicily), Auto Club of Milan.
 April 25-28.....—Touring Contest, Automobile Club of Touraine.
 April 28.....—Chateau Thiers Hill Climb.
 May 24-27.....—Volturette Contest, Automobile Club of Austria.
 May 29-June 1.—Irish Automobile Club Reliability Trials.
 June 3-12.....—Herkomer Cup, Automobile Club of Bavaria.
 June 14.....—German Emperor's Cup, Taunus Circuit, Imperial Automobile Club.
 June 24-29.....—Scottish Reliability Trial, Scottish Automobile Club.
 June 25-July 8.—Grand Prix, Automobile Club of France. (Exact date to be decided upon.)
 Aug. 11-20.....—Coup d'Auvergne, France.
 Aug. 18-22.....—Ardennes Circuit (Belgium) and Coupe de Liège kerke.

MIDWINTER ACTIVITIES OF THE CLUBS.

Characteristics of the Proposed Illinois Auto Law.

CHICAGO, Jan. 21.—Throughout Illinois automobilists are lining up to support the bill introduced into the State Senate by Senator Humphrey, and will make a hard fight to put the measure through. Two years ago a similar law was passed by the Legislature and vetoed by Governor Deneen. This session it is hoped to prove to the Governor that public sentiment is favorable to fair play for automobilists. The bill was drawn up by Secretary Sidney Gorham, of the Chicago Automobile Club, and will receive the backing of that powerful body and Chicago Motor Club, which, though only recently formed, has achieved an enviable reputation for energy and push.

The most important features of the Humphrey bill are the clauses fixing speed limits throughout the State at twenty miles per hour in the country districts, fifteen miles for the cities, and ten miles per hour in congested business centers; registration by the Secretary of State, who on payment of a \$2 fee will issue numbers and tags good in any part of the State. Speed limits in municipalities less than the marks fixed by law and local licenses and numbers are abolished. It is provided that every car shall carry for from one hour after sunset to one hour before sunrise at least two lighted lamps showing white lights visible at least 200 feet, and one red light in the rear. Cars must be provided with good brakes and a bell, horn, or other signaling device.

Another clause provides that any person driving a motor vehicle in a race on a public highway shall, upon conviction, be fined a sum not exceeding \$50, and still another clause provides that automobilists shall, at request, or upon signal by holding up the hand or otherwise, from a person riding or driving a horse or horses in the opposite direction, cause the motor vehicle to stop and remain stationary, and shall, if requested, stop the engine of said motor vehicle so long as may be necessary to allow said horse or horses to pass. Special registration of professional chauffeurs is provided for, the fee for same being set at one dollar.

Friday Evenings at Long Island Automobile Club.

BROOKLYN, N. Y., Jan. 22.—There is always "something doing" on Friday evening at the home of the Long Island Automobile Club. The most recent announcement of the entertainment committee includes the following: Friday evening, January 25, exhibition of 1907 cars—Ford, Thomas and Stevens-Duryea—music and refreshments; Friday evening, February 8, smoker and vaudeville show; Friday evening, February 15, exhibition of 1907 cars—Oldsmobile, Matheson and Dragon—music and refreshments; Friday evening, March 1, smoke talk, etc., and on this occasion A. R. Pardington, vice-president and general manager of the Long Island Motor Parkway, will tell all about that notable enterprise, and the progress that is being made; Friday evening, March 15, vaudeville show. The regular monthly meeting will be held Wednesday evening, January 30.

Theft Rouses the Grand Rapids A. C. to Action.

GRAND RAPIDS, MICH., Jan. 21.—Recent cases of aggravated automobile thefts and slashing of tires have awakened the Grand Rapids Automobile Club to action, and the latter has now determined to put a stop to the practices. The first step in the agitation is the offering of a reward of \$50 for the persons who stole the car of W. S. Gunn from in front of his residence and later deserted it. The large number of cars in Grand Rapids has made it exceedingly difficult to locate a stolen one, but business men and automobile owners alike are determined that the marauders shall be captured and summarily dealt with.

California Claims the Pioneer Woman's Auto Club.

SAN FRANCISCO, Jan. 16.—The recent organization of a women's automobile club in Philadelphia has awakened public attention to the fact that California, and this city in particular, claims priority in the forming of an auto club composed entirely of the fair sex. The president of the California Woman's Automobile Club, Mrs. J. A. Marsh, to support the contention, makes public the history of the organization, as follows:

"The club was organized on October 4, 1905, at my home. After the second meeting we secured quarters in the California Women's Club, where the meetings were held thereafter. We had exceedingly pleasant rooms and were thinking seriously of securing a building of our own when proceedings came to an abrupt stop in April of this year, in consequence of the great disaster which overtook our city. The first run of the club was to San José. There was a large attendance, and at that meeting the membership was almost doubled. The club had also under consideration the scheme of short picnic runs that could be held in a day.

"For the present the officers of the club are preparing to hold the annual meeting in January. At that time we shall elect officers for the year and lay plans for an active season. First there will be a series of luncheons at which papers will be read. These papers are to be prepared by members of the club and some of the well known men authorities in the sport. The men will not, however, be present, as the club bars the sterner sex from all its meetings. These luncheons will occupy the time between the annual meeting and the spring-time, when the roads will again be open for driving. Then will come short runs of a day's duration until the latter part of May, when the officers plan to conduct a race meet, at which only women will be permitted to compete, and gymkhana games. The race meeting is to be followed by the annual vacation outing. This will occupy from one to two weeks. It will consist of a tour of the State. One of the objects of the run will be the establishing of clubs in the larger cities visited.

"If the race meet in the spring is a success another will be held in the fall. While the members are planning and taking part in the pleasures of the pastime they will not be forgetful of the hard work that is a part of the life of the club. At the monthly business meeting the members will plan for the improvement of the roads and for obtaining legislation toward that end. The matter of legislation is in the hands of the Automobile Club of California, but our organization is going to do its part in helping the work and in seeing to it that the laws are strictly observed."

Benefits of Organization Shown by Cleveland A. C.

CLEVELAND, O., Jan. 21.—Lack of enthusiasm which has marked club work in Cleveland in previous years is undergoing a radical change. One of the best evidences of this is the program mapped out by the Cleveland Automobile Club for the new year, and the great interest being manifested in the work as evidenced by the attendance at the smoker recently given by the club at the Hollenden Hotel. A goodly proportion of the membership and a number of invited guests were present. Addresses were made by a number of prominent automobilists. The trend of the arguments pointed to the great enlargement of the enjoyments of autoing which could be made possible through organization of those interested.

W. P. Sholes, president of the club, sounded the keynote when he said that the success of all movements in the busi-

ness world were due to organization, system, and combination of effort. While astonishing progress has been made in the development of means of locomotion, the subject of road improvement had received little attention in this portion of the country, especially in Ohio. Not only in road conditions, but in laws governing the use of automobiles, is the Buckeye State deficient. The present automobile law is crude, insufficient, and narrow as compared with those in force in other States. Local ordinances in many communities are conflicting and embarrassing to local people as well as to tourists. In a number of portions of the State there have been efforts to improve roads, but the work has been spasmodic, and there has been a lack of uniformity.

In brief, he thought it the duty of the Cleveland Club to lead in the movement to secure better roads and better laws. To accomplish this the club must be made stronger. At present it has about 500 members, but he thought this was altogether too small, considering the fact that there are more than 3,000 owners in the city. He pointed out that the club had accomplished much good in the past, and had large plans for the future. He stated that about \$10,000 had been pledged for the building of a stretch of model road east from Cleveland, and that the success of the movement originated by the club was now assured. The club has stimulated the organization of the Ohio State Automobile Association, and has aided in the formation of clubs in some of the largest cities of the State. Cincinnati, Columbus, Springfield, Ashtabula, Akron, Elyria, and several other towns now have good live clubs, while the Toledo and Dayton clubs promise to reorganize and assist with the work. He thought that a membership of 3,000 ought to be secured for the State organization without much difficulty.

During the Cleveland automobile show the Cleveland Automobile Club will hold open house in a portion of the Central Armory, where the show will be held. A suite of rooms off from the main exhibition hall has been set aside for the club, and it will be fitted with every convenience and comfort for the entertainment of visiting automobilists. Everyone will be welcome. There is talk that the club may decide to hold a banquet, to which all visiting automobilists and local owners will be invited. The club is sparing no legitimate means to build up its membership to a very high mark, and it is believed that these entertainments will have the desired result.

Buffalo's Plan for Chauffeur Bureau Outlined.

BUFFALO, N. Y., Jan. 21.—A plan, which it is hoped will do much toward effecting a satisfactory solution of the chauffeur problem, is being fathered by the Automobile Club of Buffalo. It possesses the merit of being comparatively simple in theory and one that is very easily carried out. Secretary Dai H. Lewis of the club has written the following letter, which fully explains the plan in detail to the secretaries of all the automobile clubs in the country:

"It has been suggested that if the various automobile clubs organized a chauffeurs' reference and employment bureau for the protection of members and also with the belief that it will inure to the benefit of the best class of chauffeurs by segregating them from the immoral and intemperate class; and it will also assist chauffeurs to obtain employment with the best employers, *i.e.*, members of the various automobile clubs.

"It is believed that if all the automobile clubs throughout the country will take up this serious question aggressively the morale of chauffeurs will be greatly increased and the chauffeurs' troubles will be largely minimized."

American Auto Tourists File a Protest.

NEW YORK, Jan. 22.—On the recommendation of the bureau of tours of the Automobile Club of America the board of governors of the club has passed the following resolutions protesting against the expensive crating of automobiles for foreign shipment required

by transatlantic steamship companies, a matter that has been costing American autoists several thousand dollars annually:

Whereas, many members of the Automobile Club of America and owners of automobiles are desirous of taking cars to and from Europe; and whereas,

The expense of doing this is very great and such expense is increased by reason of the cost of crating, the drayage to and from the steamship, the use of cranes and lighterage; and whereas,

It is desirable that this expense should be reduced as much as possible; and whereas,

Automobiles are carried in Europe without being crated, it is Resolved, That this club call the attention of the different steamship lines plying between this country and Europe to the fact that in its opinion the crating of automobiles, the charge for the use of hoisting apparatus and lighterage are entirely unnecessary and that the steamship companies be requested to make arrangements by which they will carry automobiles across the Atlantic without crating.

A. C. of Philadelphia Elects a New Treasurer.

PHILADELPHIA, Jan. 22.—At last week's meeting of the Automobile Club of Philadelphia, the vacancy in the treasurership and in the board of governors caused by the resignation of J. Maxwell Bullock was filled by the appointment of Jacob J. Leeds. H. Bartol Brazier, secretary, and G. L. Gundlfinger, assistant, were continued in office for another term. Isaac Starr, Jr., chairman of the committee appointed to establish a legal department, whereby all members who run afoul of the authorities may receive legal assistance and advice, was given *carte blanche* to complete arrangements therefor.

CLUB DOINGS IN GENERAL.

PHILADELPHIA.—The Quaker City Motor Club is considering the project of a hill climb for Decoration Day, which will be of national importance, open to all owners, dealers and manufacturers. There are a number of suitable hill courses in the suburbs, one of which will be selected.

UTICA, N. Y.—Officers elected at the annual meeting of the Utica Automobile Club are as follows: President, George A. Frisbie; first vice-president, F. W. Sessions; second vice-president, R. B. Billings; secretary-treasurer, Robert M. Hunt. The club now has a membership of seventy-six.

BINGHAMTON, N. Y.—Fully twenty-five members of the Binghamton Automobile Club attended the auto show in Madison Square Garden last week. The club is particularly active this winter, and is mapping out a season's work for the coming summer that will give the organization great prominence in the work of highway improvement.

NEW YORK.—President Samuel B. Stevens, of the New York Motor Club, has appointed a committee, consisting of Prof. F. R. Hutton, Robert Lee Morrell, A. H. Rutherford, T. F. Moore and A. Schwalbach, to investigate the proposed automobile speedway along the line of the Catskill reservoir and report upon same with a view to indorsement by the club.

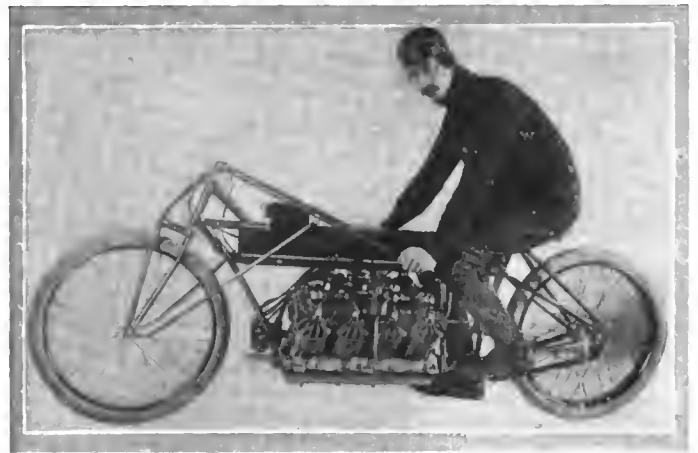
NEW YORK.—Thirty-two new members have been elected to membership in the Motor Boat Club of America since December 1. The club is considering the project of a long-distance race from New York to the Jamestown Exposition, by the outside course, at the time of the club's annual cruise to Hampton Roads, arriving there in time to participate in the motor boat carnival which opens September 2.

ST. LOUIS.—Speaking for the St. Louis Automobile Club, Secretary Roy F. Britton says that the organization will not go into the courts to test the validity of the present ordinance restricting the speed of autos to eight miles per hour in that city. The club believes that nothing can be gained by fighting the law, but believes that a more liberal ordinance should be enacted, raising the speed limit in driveways of the public parks to fifteen miles per hour.



THE HARROUN RECORD SEEKER AT ORMOND.

Has 8-cylinder air-cooled motor, weighs about 250 pounds, and has been successfully tried out on the Ormond-Daytona course.



CURTISS 8-CYL. MOTORCYCLE ALSO WANTS RECORDS.

Said to be the largest and most powerful machine of its type [in existence—40 horsepower. This week at the Ormond races.

ON THE SEA-SWEPT SANDS AT ORMOND

By A. G. BATCHELDER.

HOTEL ORMOND, Jan. 22.—There won't be much of a story to tell of the doings this week on Florida's famous stretch of sand, and this a pity, for the weather is perfection, the program well planned, the officials experienced, and all indications pointed to a successful racing innings.

The reasons are several and the principal one is the presence of the Stanley steam sprinter, which appears certain to lower its world's mark of :28 1-5 at the first favorable opportunity. This abnormal auto racing craft qualifies for the game under liberal interpretation of the rules, but its superiority over the gasoline flyers stops at a distance under five miles. Of course the short distance performances of such a vehicle should rank second in worth to the prolonged high speed traveling of cars quickly converted to general use, but the more startling dashes of this steam space annihilator command greater attention in the daily press. Hence the gasoline makers have practically left the Ormond-Daytona meet to the Stanley and reserved their competition to events wherein sprints will not detract from the more valuable middle and long-distance struggles which call for speed provenly coupled with the characteristics of endurance.

Even the Darracq contingent, which a year ago conquered steam in the two-mile-a-minute star race, seems to have deserted the field after entering. At this writing the absence of Wagner, the Vanderbilt winner, looks probable, and though there may be trouble for him and his company with the racing authorities, dispatches involving the Florida East Coast Automobile Association, the American Darracq Company, and Chairman Thompson have not resulted in the assurance of the presence of the noted Frenchman in the 100-mile race scheduled for Friday.

There is available a fairly large number of touring cars of various kinds, and with these and the steam cars a program will be patched out to accompany the mile steam sprints, which, it is predicted, will be faster than 130 miles per hour. Monday Marriott did :38 3-5 without much effort, and the equanimity with which it was received contrasted vastly with the enthusiasm created by W. K. Vanderbilt's :39 of only two years ago.

January dates for a Florida meet are mighty inconvenient for many in the automobile trade, and both entry list and attendance are suffering from this fact. The Chicago show too closely follows the Madison Square Garden exhibition, and



FERRYING THE OLDSMOBILE FLORIDA PATHFINDER ACROSS THE ALTAMAHA RIVER, A CHARACTERISTIC GEORGIA STREAM.



FINDING WHAT PONCE DE LEON SOUGHT AT ST. AUGUSTINE.

those who must attend both cannot be lured to the "Land of Flowers" for such a brief stay, especially when for three years previous the weather has been of the most uncertain variety.

Up to the present time no records have been broken, as the course for the past two days was not in first-class condition, numerous small gullies having been left in the sand by the receding tides. In to-day's events E. B. Blakeley, a Harvard student, driving a Mercedes car, won the five-mile race for all classes of cars from a standing start. The other starters were: R. A. McCready, 20-horsepower Rolls-Royce, and H. E. Rogers, 25-horsepower Stanley. Blakely got away in the lead, but Rogers got by him in the first mile and had a lead of nearly a mile, which he held for nearly four miles, when his steam seemed to fail and Blakely and McCready passed him.

The Stanley "Bug," driven by Fred Marriott, and Capt. Hutton's 20-horsepower Rolls-Royce, piloted by R. A. McCready, were the only starters in the five-mile flying start record race. The steamer won by a mile or more.

A slow race for stock cars for a quarter of a mile on the high gear had seven starters. W. A. Adriance, in a Stevens-

Duryea car, won in 1:13; Walter C. Baker, Peerless car, was second, and Ralph Owen, Oldsmobile, third. The cars carried a full quota of official observers.

In the mile contest, with flying start, for stock touring cars, fully equipped and carrying four passengers of an average weight of 150 pounds, there were three starters: Frank Durbin, 20-horsepower Stanley; G. D. W. Rose, 30-horsepower Stoddard-Dayton, and R. A. McCready, 20-horsepower Rolls-Royce. The Stanley won easily by a furlong from McCready in 53.2-5 seconds, the same distance separating McCready from Rose.

Summaries, First Day, January 21.

ONE MILE RECORD TRIAL.

- Stanley Steamer, 30-h.p.; driver, Fred Marriott.....38 4-5 sec.
- Curtis Motorcycle, rider, George Curtis.....1:04 4-5
- Stanley Steamer, 30-h.p.; driver, L. F. Baldwin.....Did not finish.

Summaries, Second Day, January 22.

FIVE MILES, STANDING START, FOR ALL CLASSES OF CARS, AMATEURS TO DRIVE.

- 1. American Mercedes, 70-h.p.; driver, Edward Blakely.....4:26
- 2. Rolls-Royce, 20-h.p.; driver, R. A. McCready.....
- 3. Stanley Steamer, 30-h.p.; driver, H. E. Rogers....Did not finish.

FIVE MILES, OPEN, FLYING START, FOR WORLD'S CHAMPIONSHIP RECORDS.

- 1. Stanley Steamer, 30-h.p.; driver, Fred Marriott.....3:44 4-5
- 2. Rolls-Royce, 20-h.p.; driver, R. A. McCready.....4:52 4-5
(Record, 2:47 1-5, made by Marriott last year.)

MILE-A-MINUTE, FLYING START, FOR TOURING CARS, FOR THE AMERICAN CHAMPIONSHIP.

- 1. Stanley Steamer, 20-h.p.; driver, Frank Durbin.....:53 2-5
- 2. Rolls-Royce, 20-h.p.; driver, R. A. McCready.....1:09 2-5
- 3. Stoddard-Dayton, 30-h.p.; driver, E. D. W. Rose.....

SLOW RACE, QUARTER MILE, FOR TOURING CARS, ON HIGH GEAR.

- 1. Stevens-Duryea, 30-h.p.; driver, W. A. Adriance.....1:13
- 2. Peerless, —h.p.; driver, Walter C. Baker.....
- 3. Oldsmobile, 40-h.p.; Ralph Owen.....

FIVE MILE FLYING START MATCH RACE.

- 1. Stanley Steamer, 30-h.p.; driver, H. E. Rogers.....3:54 4-5
- 2. American Mercedes, 70-h.p.; driver, Edward Blakely....

ONE MILE STOCK TOURING CARS.

- 1. Oldsmobile Pathfinder, 35-h.p.; driver, Ralph Owen.....1:12
- 2. Winton, 30-h.p.; driver, Asa Palne
- 3. Wavne, 30-h.p.; driver, A. L. Kull



RECEPTION OF THE OLDSMOBILE FLORIDA PATHFINDER AT HOTEL ORMOND, ON THE CONCLUSION OF ITS HISTORIC TRIP.

HOTCHKISS TAKES A. A. A HELM.

(Continued from page 182.)

road appropriations are from the States, as the result of local agitation, and future work in this direction must be done largely through State associations and clubs. This work is, however, the most far-reaching of all work attempted by automobile bodies, and as a part of it, a great central committee representing most of the States can, by co-operation and counsel, accomplish much.

It is suggested that there are already too many good roads committees. Perhaps so. Yet even a central sub-committee, composed of representatives of national organizations only, cannot accomplish in a year what a State committee, familiar with local conditions, can in a month. Decentralization, rather than centralization, is necessary to the good-roads movement, and this association will do well if it leaves this matter largely with the States.

The recent enthusiastic launching of the Long Island Motor Parkway project marks an era in road development. Some suggest that it means that, as motor vehicles become larger and more powerful, they will, like the older locomotive, be driven to roads of their own, and the early history of the steam car on the public highways be repeated. Vital differences between the locomotive and the motor car, together with the increasing acquiescence of the public in their operation on the common roadways, preclude such a result. However, that, side by side with the highways, especially in populous districts, will be constructed private roads for motor vehicles is no longer a prophesy; no more is the statement that, before many years have passed, they will be constructed not by enthusiasts, but purely as an investment. The association is to be congratulated on the activities of many of its prominent members in the pioneer movement of this kind and, while not actively participating in any private work, should co-operate with members desiring to promote or construct such motor highways to the limit of its power. In the division of the associations work this new branch naturally falls within the sphere of the good-roads board, and to such board should be assigned.

Touring.—How far the association should assume charge of a tour, which is, in effect, a trade contest, is a difficult question. The very conditions surrounding a struggle for the best advertisement make successful management doubtful from the start. Criticism is certain; all of it loud voiced, much of it trivial, and, doubtless, a deal of it unwarranted. It is hard to say, however, that the association should not hereafter regulate the contest for the Gilded trophy, so generously given into its custody, and the touring board will doubtless make new rules and seek again the impossible, i. e., the award of the trophy to the best tourist, when the contestants are largely professionals and the real tourist takes the other road.

The touring board, however, has work before it of a broader, better kind. While governmental conditions and the absence of nearby frontiers in the United States present far different facts than those noted by tourists in France, as our roads improve and State laws become more uniform, the association should perform for the touring motorist—and who in the coming years will not be one?—what the Touring Club of France does in the great European republic, in fact, on the continent at large. Such a work is not to be done in a day or even a decade. But a beginning can be made now.

It may be done in a very simple way. Next to roads, tourists want road signs. The touring board should at once adopt a simple metal distance sign and a code of roadside directions similar to, though not necessarily as complex, as those in use in France, and when adopted furnish a set of such samples to each State association and club, with a circular indicating the territory and roads allotted to each, as well as the cost of the signs, and requesting immediate action. Moreover, if the treasury warrants, the association will find no saner use for its funds than by proportionate appropriations toward the road-sign expense of its affiliated bodies.

This, however, should be but the beginning. There should be established in the secretary's office, under the general supervision of the touring committee, a bureau of touring information, by which should be collected all published touring information as to roads, laws, hotels, maps and the like, which information should be given out to a member on request, and, if funds warrant, later published on route cards. Here the member in doubt as to the best road, in search of information as to roads improved or in process of improvement, seeking to purchase the best maps of a given territory, asking suggestions as to hotels, and, above all, desiring information as to speed restrictions and registration requirements, should be able promptly and without expense to learn. Little can, perhaps, be done the first season. But let the work be begun, and, if properly systematized, it would shortly put a value on membership not now felt and, in the end, point the way to a touring department which might include within itself all the benefits that make membership in the Touring Club of France so essential to European motor travel.

Racing Board.—The function and work of the racing board have

been so prominent a part of the history of the Association as to need no comment here. The subject of racing and racing rules can safely be left with the racing board.

The Press.—Absolute impartiality between representatives of the daily or the trade press must be the rule, and any infraction of it should be noted and sharply reprimanded.

Such are some of the considerations which seem to deserve mention at the outset of the present administration. They are put forward, not as pledges, but suggestions. Ready sympathy with and quick response to the official actions of the executive and other committees and boards are essential to efficient work.

I bespeak of you all that cooperation in labor from which alone can come that for which we all give our time and our thought—the greatest good to the greatest number of road users, be they yet motorists or not.

NEW STATE SECRETARY IS ELECTED.

At a meeting of the board of directors of the New York State Automobile Association, held in the clubhouse of the Automobile Club of America, Saturday, January 19, C. D. Hawkes, of Albany, was elected secretary in place of F. H. Elliott, of Syracuse, who resigned to become secretary of the American Automobile Association. O. A. Quayle, the president, announced the appointment of Robert Lee Morrell, of New York, as chairman of the Good Roads Committee, who is authorized to appoint the members of his committee. A legislative committee of twenty-three was also named.

STATUS AND PROSPECTS OF THE INDUSTRY.

By ELLIOT C. LEE,

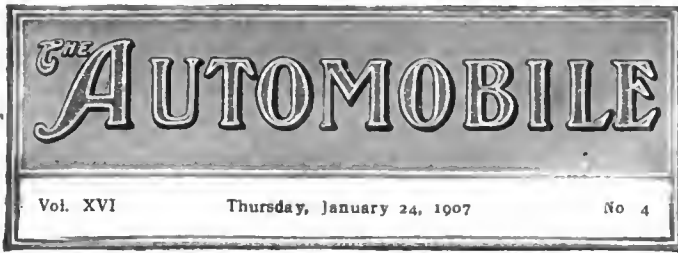
PRESIDENT MASSACHUSETTS STATE AUTOMOBILE ASSOCIATION.

It can be all summed up in the one word "amazing."

At the time of the New York Show in January, 1906, it was obvious that there was not only a vast increase in the public interest in automobiles, but also everyone could see that the public had, at least for the most part, clearly defined ideas as to the requisites of a satisfactory car. It is not enough to-day that a car should go for an all-day trip without giving trouble on the road, but it must also go quietly; must go up all reasonable hills on the high gear; the control must be simple and quick-acting; the capacity for passengers and baggage must be large, and the car, while amply strong, must not be too heavy. At the Show last year one could see that the makers had endeavored to meet all these requirements, and had, besides, made ample provision, by limousine, landaulet, and other covered or partly-covered bodies, for those who wished to use their cars without being exposed to the weather.

All this could be seen at the Show; but the following season, from March till December, really showed what the automobile industry had become. The increase in the number of cars, especially in the number of large cars, was beyond belief, almost. On Sundays and holidays the main roads in and about Boston were so crowded that it was like a procession or a parade, and not for a few hours only, but all day long. On week days the cars were not quite so numerous, but there were plenty to be seen coming and going on all the roads, and as the season went on the number seemed to increase, steadily and rapidly, until during October, and well into November, if one had been out on the roads for six or eight hours, it seemed as if one had not seen any other kind of traffic at all.

For the ensuing year it is my belief that the growth will be more rapid than ever before. Manufacturers have increased their plants, and the people have now learned that cars are made of a power and endurance to carry their passengers wherever they want to go and for as many hours as they wish to ride—and this will cause a great addition to the number of users, since many have hitherto refrained from buying cars for fear of constant breakdowns, etc. In fact, as far as I can see, the only limitation on the use of automobiles during the next ten years will be the inability of the makers to supply the cars. Even if five million cars are built during that time there will still be in this country some seventy-five million people who are not yet supplied; and other countries will want some, too.



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Hotchkiss Administration Should Bring Results. There should be a powerful national organization of automobile users. The American Automobile Association has only partially met the situation. It has promised much, accomplished some things, and left a great deal undone. That which has remained neglected is a fertile field. Every organization must have an energetic leader about whom its members can rally, assist in what he outlines, and enlist others to aid in the work for the general good. It is the busy man who has forced upon him additional duties, for all know that he will do whatever task he assumes. William H. Hotchkiss, the incoming president of the A. A. A., is a man whose time is subject to heavy demands, and reluctantly he consented to take the leadership, and he only agreed because he is aware that automobiling's future requires some immediate attention—to-day and not to-morrow. His inaugural, printed on another page, is recommended to the earnest reading of all automobilists, and if they are not members of the national body the arguments of Mr. Hotchkiss would appear sufficient reason to cause them to make application for such membership at once.



The Crime of False Registration Tags. No more effective way of preventing the reprehensible use of fake registration numbers can be established than that of compelling a visitor from another State to carry a national touring number which shall be issued to him only after he has been properly registered in his home State. The protection of owners who are observing the law requires that these highwaymen of

automobiling be apprehended in a summary manner and be given a punishment of a severe nature and one that will serve as a warning to others who are tempted to disguise their identity with fake numbers. It would be a most convenient arrangement for the registration sign to have on one side the driver's home number and on the other side his national designation. As it is, in those States which recognize the licenses of other States there are automobiles which have never been driven a mile in the States from which their owners pretend to come. This abuse has been an argument frequently employed by autophobes, and it is an evil which should have general attention before the new army of owners takes to the roads in the spring; for though automobiling is now a year-round pastime, the majority of owners prefer a winter season of inactivity. That the practice represents a most facile method of deception as well as one that is most difficult to detect, must be evident on but a moment's consideration of its possibilities. The difficulty of obtaining evidence sufficient to apprehend a suspect is such that the autoist who wishes to avoid payment of the taxes in those States that recognize alien licenses or registration tags has but to purchase one of the latter to be safe from this draft on his pocketbook as well as the more serious certainty of being apprehended through a genuine registration tag in case of accident.



Setting a High Standard for Future Shows.

From whatever point of view it may be considered, the seventh annual show of the Association of Licensed Automobile Manufacturers must be put down as the most successful event of its kind that has ever been held in this country. Whether regarded from a purely esthetic standpoint, or its reverse, the absolute commercial view, including as it does that far from unimportant consideration of matters financial, the show must be conceded to represent an event that will go down into history as having marked a hitherto unapproachable achievement, as well as setting a standard for future events, that will call for strenuous endeavors and no little outlay if it is to be equaled.

Those who had an opportunity of seeing for themselves the magnificent setting that was prepared for the automobile, as well as the beauty and mechanical soundness of the cars that occupied every available foot of space on the main floor and elevated platform of the Garden, need no statistics to impress upon their minds the vastness of the showing nor the elaborate scale on which things were done, while to those who were not so fortunate they must fail to convey anything but a hazy idea. However, a few random figures may not be amiss in that they serve to give an inkling of the extent of the industry that was represented by the gala showing. For instance, 45 exhibitors displayed 230 cars of all types, beside which there were put on view eight of the racing cars that took part in last year's Vanderbilt cup race.

These ranged in price from \$400 to \$12,500, probably averaging something like \$2,000 each for the whole, so that this part of the show alone was valued at close to half a million dollars in round numbers. Add to this the vast assortment of wares, many of them of an expensive nature, shown by the 204 exhibitors of accessories who occupied every square inch of floor room that could not be utilized for showing cars, and the value of the whole approaches a figure that far outshadows anything of the kind ever attempted in this or any other line of endeavor. If this were not enough, the mere fact that the association, under the auspices of which the show was held, felt justified in spending such a sum of money to ornament the building for one week is sufficient to indicate the truly elaborate scale on which the affair was managed. Concerning the show's status as an annual fixture of the metropolitan winter season, the announcement that the city's most prominent hostelrys were all full to overflowing is ample evidence of the strength of its attraction. This, taken in connection with the statement that the last Horse Show did not fill the hotels, is a stronger indication than ever of its potency.

NO ACCESSORIES SHOW NEXT FALL.

Next to the business of electing a set of officers for the ensuing year the chief matter of moment before the Motor and Accessories Manufacturers, Inc., at its annual meeting held during show week was that of passing on the question of holding an exclusive accessory show next fall. After some discussion it was voted down. The following were elected officers

for the coming year: President, H. S. White, Shelby Steel Tube Company; first vice-president, H. E. Raymond, the B. F. Goodrich Company; second vice-president, William H. Crosby, W. H. Crosby Company; third vice-president, E. W. Beach, Manufacturers' Foundry Company; treasurer, W. S. Gorton, Standard Welding Company; secretary, P. S. Steenstrup, Hyatt Roller Bearing Company. The following were elected directors for the same period: D. J. Post, the Veeder Manufacturing Company; J. W. Gilson, the Hartford Rubber Works Company; C. E. Whitney, the Whitney Manufacturing Company; H. T. Dunn, the Fisk Rubber Company; F. E. Castle, Gray & Davis; C. T. Byrne, Byrne, Kingston & Co.; L. M. Wainwright, Diamond Chain & Manufacturing Company. The meeting was held at the Hotel Astor, and there were about ninety members present, either in person or represented by proxies.



PETER S. STEENSTRUP,
Newly elected secretary of the Motor and Accessories Manufacturers, Inc., who conducted the Fifth Hyatt Feast at the Waldorf-Astoria so successfully during show week.

In the course of his address, the president gave a résumé of the year's work, stating that the association now has a membership of 173. The treasurer's report showed the association to be in sound financial condition, while the advertising committee read a detailed report of its work which was received with great interest by the members. Both the president and the treasurer were tendered a rising vote of thanks for their efforts during the past year.

LEGISLATORS ARE BUSY IN ALBANY.

Drastic automobile laws are threatening in Albany. If the bill introduced in the Assembly on January 9 should become law not only would the maximum speed limit be reduced from twenty to fifteen miles, but machines would have to be geared so as not to be able to produce any more than the lesser speed. Three other bills affecting automobiles have been presented to the legislature and more are expected shortly. Assemblyman Hamn's bill gives town boards the right to limit speed outside villages, and would, if passed, bring in a fifteen miles limit in many districts where twenty miles are now permitted. Assemblyman Cuvillier provides in his bill an annual license fee of \$25 for chauffeurs, an examination as to qualifications, a twenty-one-year age limit and ability to read and write English. Assemblyman Stanley has an elaborate measure providing for a State Motor Vehicle Commission, to have entire control of automobiles. Chauffeurs must be at least eighteen years old and a "reasonable and proper rate of speed" must be observed. The Albany Automobile Club favors asking Congress to provide for uniform interstate licenses. An annual tax will not be objected to if the proceeds are applied to the improvement of highways and oiling of country roads. Two later bills provide for insurance against accidents by automobiles, and amend the insurance law by including automobiles in the list of insurable property.

AERONAUTS WILL HAVE BUSY YEAR.

PARIS, Jan. 15.—The year 1907 promises to be one of considerable activity in the French aeronautic world. Comte Henry de La Vaulx has already made two or three successful trial trips in his new steerable balloon, and will very shortly remove to his new balloon garage at Saint Cyr. Walter Wellman, of Polar fame, has installed himself in the vast Galerie des Machines, close by the Eiffel Tower, where he is fitting out his balloon equipment previous to shipment to Spitzburg. The balloon has a total length of 177 feet, and is driven by a 90-horsepower motor. At the end of the month the Aero Clubs of France and Spain will meet at Bordeaux to commemorate the first crossing of the Pyrenees by the late J. F. Duro. Early in the spring the new balloon sheds and inflating station of the Aero Club of France, located at Saint Cloud, near Paris, will be officially opened, and a few weeks later the clubrooms will be removed to a new building in the center of Paris.

Heavier than air enthusiasts, at present busy in their workshops, will come out with their new machines with the first signs of spring. Santos-Dumont is looked upon as a certain winner of the 50,000 francs' Grand Prix, but will have as competitors Captain Ferber, Bleriot, Tatin, Société Antoinette and Comte de La Vaulx.

The new military steerable balloon *Patrie* is awaiting less wintry weather to allow it to make its long journey from Paris to Verdun, its fighting port on the German frontier. Later in the year the *République* and the *Démocratie*, both designed by the engineer Julliot, will join the fighting ranks. The *Lebaudy* will remain at Chalois-Mendon for the training of military officers.

Coming competitions include a long-distance test in May, Le Figaro race in June, the Grand Prix of the Aero Club of France in September, and the Gordon Bennett contest in October, at which France will have a full team. The *Ville de Paris*, M. Deutsch de la Meurthe's new steerable, will attempt to win the \$4,000 cup for the first complete tour around Paris.

A. L. A. M. PRESIDENT ON BRITISH SHOW.

Charles Clifton, president of the Association of Licensed Automobile Manufacturers, has just returned from a trip through Europe. While in London he attended the big Olympia automobile exhibit, and gives it as his opinion that for show methods and artistic treatment the American exhibit is far superior. In respect to the cars, however, Mr. Clifton spoke in high terms of the progressive manner of the English manufacturer, who, like the American maker, seems to have found the keystone of the industry in using materials of a higher quality, with better constructing methods than hitherto, and thus building cars of permanency and reliability.

"The predominant feature in the English automobile industry," he added, "is the pronounced popularity of the six-cylinder car and the number of different makes that are being turned out. It has surely taken root among English motorists more firmly than anywhere else."

MR. VANDERBILT'S INTEREST IN PARKWAY.

A recent cablegram from W. K. Vanderbilt, Jr., president of the Long Island Motor Parkway, Inc., from Paris, sending a substantial subscription, indicates that Mr. Vanderbilt has not ceased to make the Parkway his first care. Mr. Vanderbilt is being kept fully informed as to the progress of affairs, particularly as to the procurement of rights of way. The recent action of the Board of Trade in Riverhead in voting to subscribe to about \$25,000 worth of stock and bonds and its guarantee to secure at least twelve miles of right-of-way and turn the same over to A. R. Pardington, the second vice-president, makes apparent the firm belief of that organization in the benefits to accrue to the town as a direct result of the construction of the Parkway.

GREAT BRITAIN AND THE TOURIST TROPHY

LONDON, Jan. 14.—True to its declared policy of last year, the Automobile Club of Great Britain and Ireland will not lend its support to any international event for racing cars, but will devote all its energies to the improvement of the Tourist Trophy Race. This time the race will be held at the end of May and probably on the same Isle of Man course as before. The rules governing the contest are materially the same as in the previous races, but this time the fuel will be a special brand of gasoline supplied by the club, and allowance one gallon for each 25 miles traversed. Six circuits of the 40-mile course will be made, and doubtless an average of nearly 45 miles an hour may be expected from the winner.

Since the issue of the rules for this race, however, a suggestion advanced by the Society of Motor Manufacturers and Traders has been agreed to by the club, and to-day there are issued rules governing the International Heavy Touring Car Race. This is purposed to be a race for the development of ideal touring cars, such as are usually fitted with covered bodies and of the horsepower required by the ordinary user, as opposed to the racing car. The limitation of power and speed is effected by fixing a definite fuel allowance of one gallon of gasoline for each 16 miles of the course. To be held this year on the Isle of Man in September, the race will be in distance between 250 and 400 miles, and the system of controls will possibly be reintroduced. A total load of 2,240 pounds, inclusive of driver and mechanic, must be carried by the chassis, and while no weight limits are imposed for the chassis, definite standards are set up for size of the track, wheelbase and body. To prevent undue raising of the gears, that Tourist Trophy rule is incorporated which requires a half mile to be covered at a

rate of not more than 12 miles an hour without slipping the clutch. The entry fee is fixed at \$150, and the list will remain open until May 1.

Formation of the Brooklands Automobile Racing Club

has already been chronicled, and great efforts are being made to enable the official opening of the club's track at Weybridge, to take place in May. For the first meeting, provisionally dated May 18, some big prizes are announced, including the Montague Cup of \$10,500; the Gotlieb Daimler Memorial Plate of \$3,250, and the Marcel Renault Memorial Plate of \$2,750, the total of the day's list reaching \$23,000. Plates are offered at first, but later it is intended to run sweepstakes and handicaps when the track becomes more familiar. To the fore, as ever, S. F. Edge has booked the track for the first available day with the determination to set up on a 60-horsepower Napier a new world's 24-hour record, a speed average of 60 miles an hour being reckoned on. Not to be outdone, Charles Jarrot will attempt to lower Edge's record the following day with a 60-horsepower De Dietrich. The battle of the six vs. four cylinders will thus be waged by the foremost advocates of either system, and possibly a race between them will be arranged.

The news just to hand of the proposed European tour of American cars this summer attracts much attention, but it is to be regretted that out of the 4,000 miles total, but 250 miles is allotted for the British share of the tour, this consisting of a "hustle" straight across country to Liverpool. Surely it might be arranged to map out another few hundred miles by embracing Wales and the West of England, and possibly an interesting trip round the Lake District.

FRANCE OFFICIALLY ANNOUNCES THE GRAND PRIX

PARIS, Jan. 15.—The Automobile Club of France is resolved that in the matter of road racing it shall remain at the head of the nations of the world. Its Grand Prix last year—the successor of the Gordon Bennett—was planned to make it the most wonderful road race ever held. This year, on a date to be fixed late in June or early in July, another Grand Prix will be held differing from the last in that the fuel supply will be limited to 6.6 gallons per 62.1 miles. With such a liberal supply of gasoline monsters of 120 and 130 horsepower can be built capable of the highest speeds. Now, even in France, only a few firms have the necessary experience and capital for building high flyers, and there was a danger of the performances of the select few being eclipsed by the big entries obtained in the German Emperor's race and the Tourist Trophy of the British club. Both these are speed contests, the one with a limited cylinder capacity, the other with a maximum fuel consumption, notwithstanding the "Tourist" title of the British event and the tourist mention in the German regulations.

It is probably this which has decided the sporting committee of the A. C. F. to hold Grand Prix No. 2 on the day following Grand Prix No. 1 and over the same course. The second day's race will be for machines with a gasoline supply limited to 3.3 gallons per 62.1 miles. There will be no other restrictions of any kind. Although detailed regulations are not yet published, it is probable that the second race will be on the same lines as that of the first day, with the total distance reduced to 320 miles. There will be no controls or neutralizations; the driver and mechanic will fill tanks, change tires and do all work; a single tire and gasoline station will be placed on the circuit; dismountable rims will be allowed.

With this fuel allowance the machines are likely to average between 40 and 50 horsepower and to develop a speed of 45 or 50 miles an hour. Every manufacturer of importance builds a machine of this type; to fit it for the race would only entail slight modifications and little expense. A big entry is consequently expected, and in view of the success of the Tourist Trophy and the German Emperor's race this expectation is likely to be fulfilled.

Although enthusiastic over the new race, French automobilists do not hesitate to criticise. They ask that the 3.3 gallon machines should run the first day, the original Grand Prix being reserved for the second. Twenty or thirty heavy racers rushing round the course at mile-a-minute speeds will utterly spoil the road surface and make the task of the smaller machines unnecessarily difficult. A big entry is likely to be obtained for Grand Prix No. 2—from 60 to 100 cars are looked upon as probable starters—and if special precautions are not taken accidents will ensue.

Grand Prix No. 2, distance 320 miles, fuel allowance 3.3 gallons per 62.1 miles, is open to teams of three from any factory at an entrance fee of \$700 per car. Entries close February 7, but are received later on payment of an increased fee.

Grand Prix No. 1, distance 500 miles, fuel allowance 6.6 gallons per 62.1 miles, is open to teams of three from any factory at an entrance fee of \$1,000. Entries close on same date. Six machines have already been officially entered—three Bayard-Clément to be driven by Albert Clément, Garcet and Gauderman, three Darracqs with Wagner, Hanriot and Demogeot as pilots. Two Civelli de Bosch machines are also announced as certain starters in this event.

NEW HAVEN'S AUTOMOBILE ACTIVITIES.

NEW HAVEN, CONN., Jan. 21.—The automobile industry has reached New Haven. The University Automobile Company, of this city, C. S. Johnson, president, is now building both runabouts and a 30-35-horsepower touring car. The new machines will be known as the Continental, and the first output will be ready for the market in about two weeks. The touring car will weigh about 2,500 pounds and will embody several novel improvements, among which will be a self-starting device. This company will also carry the agency this year for the Wayne car.

The F. E. Bowers Company has been incorporated and has started the erection of a plant in this city. The new company will for the present confine itself to putting out a new carbureter, which it controls, and is said to give great promise. The new carbureter can be attached to any type of motor. The company will also deal in all automobile accessories. The corporation is capitalized at \$10,000 and will begin business at once. The incorporators are Fredsom E. Bowers, Clarence G. Spalding, Harold P. Warren, and Edward B. Spalding, all of this city.

THE AUTO PROVIDES FINE WINTER FUN.

Detroit has had very little snow this winter, but January 12 brought good sledding and fun for Michigan boys. Young Ford, the twelve-year-old son of Henry Ford, the automobile



EDSEL FORD AND HIS FRIENDS HAVING FUN.

manufacturer, has a runabout out of which he gets much enjoyment driving his mother on her shopping and calling tours and between times giving his less fortunate playmates a ride. With the first snowfall Master Edsel found a new use for the automobile and a way to entertain several friends at once. The accompanying picture illustrates a sight that is familiar to all drivers on Detroit's Grand Boulevard, but it cannot show the speed with which little Ford in his speedy runabout whipped the sleds of the other boys round corners, rolling them over in the soft snow and giving them a touch of high life generally.

THOMAS NON-STOP CAR OFF TO CHICAGO.

With 467 hours and 37 minutes, and a total mileage of something like 2,800 already to its credit, the Thomas car in charge of Ernest Kelly, of Philadelphia, that has been running steadily ever since January 2, when it was started in Harrisburg, Pa., left New York for Chicago Monday afternoon, January 21. It was originally intended to ship the car by express, with observers accompanying it to see that the motor was kept going, but this was abandoned and the trip by road undertaken despite the advice of autoists familiar with the route. The car started on its journey westward from Harry S. Houpt's new Thomas salesrooms, Broadway and Sixty-third street.



NEW CORBINS ENJOYING THE YEAR'S FIRST SNOWSTORM.

FIRST SELDEN CAR READY THIS SUMMER.

The Selden Motor Vehicle Company, of Rochester, N. Y., recently organized with a capital of \$500,000, expects to have its first new car on the market by the middle of the coming Summer. The appearance of this car will be awaited with much interest, particularly owing to the fact that E. T. Birdsall, one of the pioneer mechanical engineers of the automobile industry, is the chief engineer of the Selden company and the designer of its car. Mr. Birdsall was a technical adviser of the Vanderbilt Cup Commission for several years, is secretary of the Society of Automobile Engineers and has been a prominent official in many of the important race meets and touring contests held in this country. Frank D. Russell, who has been identified with the Rochester Car Wheel Works for the past fifteen years, will have personal charge of the manufacturing end of the Selden company, the plant of which is being located at East Rochester, where building operations are already under way. The plant will cover over eight acres of ground.

The Selden directors for the first year are: George B. Selden, George G. Foster, Frank D. Russell, Gilbert E. Mosher, R. H. Salmons and J. M. Walmsley, of Rochester, and Louis A. Fischer, A. Snyder and A. G. Bartholomew, of Buffalo. With Mr. Selden as president, the other officers are as follows: First vice-president, Louis A. Fischer; second vice-president, J. M. Walmsley; treasurer, Gilbert E. Mosher, and secretary, R. H. Salmons.



EDWARD RUSSELL THOMAS IN THOMAS "FORTY" RUNABOUT.

Considerable confusion results generally through the fact that the New York banker and the Buffalo automobile manufacturer bear the same name. The two men are not related. Mr. Thomas' sister occupies the other seat in the runabout alongside him.

PRACTICAL TESTS OF DIFFERENT FUELS.

With a view to determining more definitely just what can be done with alcohol, kerosene, benzine, naphtha, etc., for automobile use, the Maxwell-Briscoe Motor Company have just undertaken a series of tests on the road and in the laboratory. Probably picric acid will be experimented with also, in order to determine what percentages of this high explosive are practical in



MAXWELL CAR FITTED FOR SPECIAL FUEL TESTS.

connection with the fuels ordinarily used, though its employment is not at all advisable under any circumstances, even though greater speed and power are obtainable. Though "naphtha" and "benzine" are included in the list of fuels, which, it is stated, will be tested, it may be as well to add here that these are but other names for the same substance which is more generally known as "gasoline," so that the results of a formal test of their power-producing qualities would be apt to be misleading unless this were taken into consideration. Originally these names were employed to designate the varying specific gravities of the different products of distillation, but they have long since become nothing more than trade names for the same thing.

The first road test will take place this week, when three Maxwell runabouts will be driven from New York to Boston, using different fuels. One motor will be operated with gasoline, another with kerosene, and still another with denatured alcohol. Observers will be appointed by the New York Motor Club to make official reports on mileage and the quantity and cost of each fuel used. Stock cars will be used, since the experiments at the Tarrytown factory have demonstrated that a Maxwell motor will run on kerosene, alcohol or gasoline.

The chief object of the tests is to demonstrate that fuels of varying specific gravities, or density, can be used to advantage in the same carbureter. Aside from gasoline, the chief of these are alcohol and kerosene, the latter being far heavier and less volatile, which accounts for the difficulty in starting the motor on it from all cold. Both the first cost and consumption of alcohol are far greater in the present type of motor than when using gasoline, and not as much power is developed, owing to the fact that neither the compression nor the stroke are such as to utilize the expansive force of alcohol to the best advantage. There is not so much difference in the case of kerosene, and the average motor will run on it almost as well as with gasoline once warm enough to vaporize the fuel. The photograph shows the special tank fitted to the dash of a Maxwell two-cylinder car for the purpose of the tests. The data gathered will be made public later. H. A. Grant, M.E., is conducting the experiments.

Two new garages are to be built on Long Island for the coming season. One will be located at Glen Cove, the other at Bay Shore. Both will make a specialty of catering to the rapidly increasing Long Island tourists' wants.

A FRENCHMAN ON AMERICAN INVASION.

Commenting on the proposed invasion of Europe by American automobiles, Paul Meyan, a prominent French automobilist, says: "The American industry has not yet settled on definite lines; efforts are dispersed and groping—luckily for us. But as soon as the American producer has reached a higher stage he will confine himself to the production of a single type of car and turn them out in such quantities that local needs will be more than supplied. Half of the machines will be sold at home, the other half will be sent to conquer foreign markets, where they will be sold at cost price. We shall not be able to stand up before such competition; our flourishing export trade will be killed by the American series. We have only one means of protection—a customs duty. With a thirty-million-dollar export trade we are told that we have no need of protection. That is a theory; it has not yet been proved that it is a good one."

Advocates of the protectionist theory will find much satisfaction in the arguments advanced by M. Meyan. The pros and cons of the question are worth a careful investigation.

NEW SCHEBLER PLANT AT INDIANAPOLIS.

The new Schebler carbureter plant at Indianapolis, Ind., which will be ready for occupancy in about two weeks, is built of reinforced concrete and shale brick. This plant covers an entire block, and is located at Shelby and Sanders streets and Barth avenue. Its output will be 10,000 carbureters a month, and when running full force will employ nearly 500 men. Two years and a half ago, when the Schebler was first brought out, two men were employed to make the carbureters. The wonderful increase in the automobile industry is shown when a part maker in two years' time increases his facilities from an output of 400 carbureters a year to 100,000 carbureters a year. Mr. Wheeler states that the business during 1907 will run to about a million and a half dollars, according to orders now booked.

The foundry proper has the largest concrete arches above ground in the world, the span being 65 feet, without a post or support. The length of this room is 135 feet. The roofs and floors are all reinforced concrete, the foundry having a circular roof, which is a new idea in concrete construction. The



NEW HOME OF THE SCHEBLER CARBURETER AT INDIANAPOLIS.

stacks for the powerhouse are also of reinforced concrete. All modern conveniences for employes are furnished, even to lockers and showerbaths for the men. The power is generated by suction gas producers, which give 125 horsepower at a cost of only half a ton of coal a day. The cost of this plant complete, with equipment and machinery, approximates a quarter of a million dollars.

IN AND ABOUT THE GARAGES.

Modern and Finely Equipped Garage for Schenectady.

Close Brothers, of Schenectady, N. Y., are making preparations to erect a large garage in that city at a cost of about \$40,000. The location chosen is on Smith street, and the building will be of fireproof brick construction, two stories high with a basement. It will have a frontage of 31 feet on Smith street, will run back along the alley a distance of 180 feet, and will have facilities for storing 200 automobiles. There will be a glass-front vestibule, back of which will be the offices, and back of the offices will be situated a handsomely furnished parlor for ladies. On the east side there will be a passageway 12 feet wide, which will be used as an entranceway for cars. In the rear modern facilities for washing cars will be installed, and the building will be equipped with elevators running to the second floor and to the basement. Work on the building will be started at once.

New Chicago Garage Opened New Year's Day.

The Model Garage Company is the newest arrival in the Chicago field, its fireproof structure at 645-647 East Forty-seventh street, near Grand Boulevard, having been opened on New Year's Day. The officers of the company are: President, J. N. Williams; vice-president, C. Tindolph; secretary and treasurer, C. W. Williams. The building is of iron and concrete construction, 135 feet by 50 feet. Elegantly furnished reception rooms have been fitted up for the use of lady patrons on the first floor, and on the second floor is located a reading and lounging room for chauffeurs. The repair department is fitted with the latest and most approved machinery.

Big Automobile Shed for Garfield Park, Chicago.

In connection with some other extensive improvements which include the erection of what it is reported will be the largest greenhouse in the world, at Garfield Park, the city of Chicago will erect directly across the driveway from it an immense automobile shed. Garfield Park is the site of these improvements, which will cost, exclusive of the green house plants, in the neighborhood of \$250,000. The gardens will be located near Madison street, and will be connected by a pathway with the music court.

New Management for Prominent New York Garage.

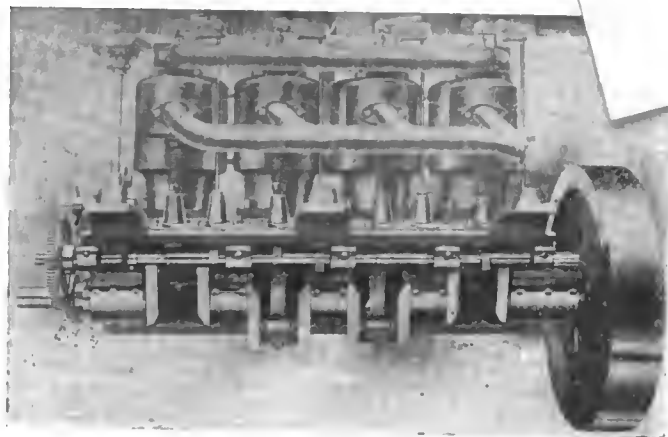
The premises formerly occupied by the Central Park Automobile Storage Company, Central Park West and 110th street, have been opened under new management by C. Herbert Covell, president of the Covell & Crosby Motor Company, and agent for the American Car. Extensive improvements are under way, and when completed will make this one of the finest uptown automobile garages.

Plans for the New Pierce Garage in New York City.

Plans have been filed for a four-story garage to be built for the Kipps Bay Realty Company, at 233-237 West Fifty-fourth street. The building is to have a frontage of 60 feet and a depth of 90 feet, the façade being of brick trimmed with limestone and terra cotta and ornamented with bays. It is to cost \$100,000, and upon completion will be occupied by the Harrolds Motor Company, New York agents for the Pierce.

A WELL-KNOWN MAKE OF MOTORS. ✓

Brennan motors scarcely need any introduction, whether to the marine or automobile interests—during the number of years that they have been on the market they have become so well and favorably known that anything on this point would be superfluous. For 1907 the makers of the Brennan motors are specializing to an even greater extent on the four-cylinder vertical type, though the horizontal, double-opposed and four-cylinder opposed types with which their name has always been connected



BRENNAN MOTOR, SHOWING WORKING PARTS IN BASE.

are continued as usual, together with the various types of sliding and planetary change-speed gears with which they are sold, making a complete power plant of almost any capacity required. The two-cylinder horizontal motors are made in seven sizes ranging from 6 to 30 horsepower, the four-cylinder horizontal in three sizes, 28, 32 and 40 horsepower, and the four-cylinder vertical type in four sizes, rated at 12, 18, 32, and 45 to 50 horsepower.

With the exception of the varying dimensions all are the same, a standard form of construction having been adhered to throughout each series of motors. Thus the cylinders are separately cast with integral waterjackets, the inlet valves are centered in the heads and operated by push rods and rocker arms, the exhaust valves being at the side. The crankshaft is made from a solid billet of nickel steel and is supported on five ample-sized bearings. The latter are made from a special bronze possessing many of the advantages of babbitt without its disadvantages. All bearings and working parts are made fast to the upper or main section of the crankcase, the latter being divided at an angle of 40 degrees, thus giving free access to every part of the motor from one side of the case, this being well illustrated by the accompanying photograph of the standard type of Brennan motor. The timer is mounted on a vertical shaft, bevel-gear-driven from the end of the camshaft, and is well protected by an effective casing. The water circulating pump is gear driven and is of the gear type. The dimensions of the various sizes are 3 5-8 by 4 inches, 12 horsepower; 4 by 4 inches, 18 horsepower; 5 by 5 inches, 32 horsepower. and 5 1-2 by 6 inches, 45 to 50 horsepower, the normal speed being 800 r.p.m., except in the case of the first named, in which it is 900 r.p.m., though the speed range is from 150 to 1,800 r.p.m. in the case of the smallest, 1,500 in the two intermediate sizes, and 1,200 r.p.m. for the largest.



WHITE 'BUS THAT WORKED HARD DURING SHOW WEEK

TWO-PASSENGER AUTOCYCLE RUNABOUT.

A glance at the accompanying illustration will explain more clearly the principle of the Autocycle two-passenger bicycle-runabout than any word description. This machine has been designed to embody in one vehicle the speed, comfort, and



VANDEGRIFT TWO-PASSENGER AUTOCYCLE.

utility of the automobile with the simplicity, lightness, and cheapness of the bicycle. The body of the Autocycle is carried upon a front steering and rear driving wheel placed tandem in the center line of the vehicle. Upon either side, connected by an axle, are smaller balance wheels which maintain the equilibrium of the vehicle, but ordinarily take little or no weight. By the use of a specially designed link check spring device these wheels remain at all times in contact with the roadway; they turn in unison with the front wheel, each at its proper angle in rounding a curve.

Power is obtained from a two-cylinder 3 1/4x3-inch air-cooled motor, developing 6 horsepower at 1,800 revolutions. Drive is direct by a belt from a pulley upon the main shaft of engine to a pulley upon the rear wheel. The motor equipment includes float feed carbureter, four dry-cell batteries, two coils, oil feed, and three-gallon gasoline tank containing fuel for 120 miles. The rear driving wheel revolves with an axle carrying a three-quarter elliptic spring upon either side, supporting the extended arms of the chassis. Ball bearings are fitted in the revolving axle, and on the side opposite to the belt pulled is an expansion brake.

Steering is through an inclined column with the ordinary type of hand wheel. The steering head turns upon thrust ball bearings. Throttle and spark control is by means of levers immediately under the steering wheel.

The body of the Autocycle is of wood, the seat and back upholstered in machine-buffed leather. There is seating accommodation for two people. The total weight of the machine is 380 pounds, and its catalogue price \$400. It is manufactured by the Vaudegrift Automobile Company, Thirteenth and Cumberland streets, Philadelphia.

PRIVATE AUTO ROAD TO REACH TUXEDO.

A private automobile highway 45 miles long is to be constructed from the Forty-second street ferry, New York, through the Jersey meadows and Northern New Jersey to Tuxedo, N. Y. It is planned to have the course consist of two tracks thirty-five feet each in width, divided by a thirty-foot road raised to a height of four feet, on which will be built a double track railroad. At each cross road there will be a toll gate and station constructed so as to allow automobiles to pass under the station, thereby making an absolutely open course for the entire forty-five miles. The Motor Car Roadway Company has been organized for the purpose of constructing the highway with a capital

of \$10,000,000, of which \$4,000,000 is to be six per cent. preferred stock. Work on the road is to begin early in the spring and to be completed in two years.

RUNABOUT DESIGNED FOR POPULAR FAVOR.

In designing the Brush runabout no attempt has been made to produce a spectacular car or to turn out an imitation of a high-priced machine. The horse and buggy is an expensive nuisance; a runabout specially designed to meet the needs of those who have heretofore been unable to buy—or if able to buy unwilling to support—a car of the conventional type, is an economical convenience.

The Brush runabout has been built to sell at \$500. Low running expenses have been borne in mind, and it is estimated that the total cost for 5,000 miles, including tires and repairs, should not be more than \$75 or \$100.

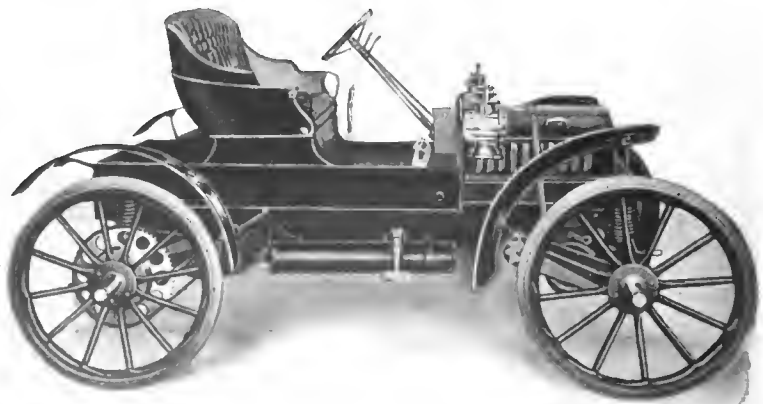
A 6-horsepower single-cylinder vertical engine supplies the motive power. It is carried forward under a bonnet, thus making it fully accessible, and is water cooled. With this horsepower more than the legal speed can be maintained, while fuel and oil cost is reduced to a minimum.

As this type of automobile generally gets into the hands of persons of little experience, special care has been taken to give it an absolutely safe fuel system. The tank is the lowest part; the fuel is taken out at the top, and only while the motor is running. There is no float or float valve, no pump plunger or gland, no pressure in the tank, and all piping is above the highest gasoline level. The change-speed mechanism provides eight set speeds, direct drive on the high; gears may be shifted without releasing the motor, and there is no noise or shock in changing. The change-speed mechanism and brakes are commanded by two foot pedals, giving remarkably easy control. The steering gear is irreversible; it is slow and powerful for straight ahead, but accelerates as the steering wheel turns, so that three-quarters of a turn puts it hard over.

Little items of convenience have been carefully studied. Thus the spark plugs may be instantly inspected without unscrewing or disconnecting the wire. Access to the connecting rod bearings is almost instantaneous. Both valves can be removed in thirty seconds. The sight-feed oiler on the dash is automatic. Sprockets are interchangeable, so that when one side of the tooth is worn they can be reversed.

The Brush runabout is equipped with coil-spring suspension because considerably less than one-half of the weight of spring is required, and because there are fewer joints. With the coil springs is combined a friction-spring retarder or shock absorber, so that the regular equipment of solid tires give very easy riding. Pneumatic tires can, however, be fitted.

This machine is being built by the Brush Runabout Company, having its headquarters in Detroit. Deliveries in quantities will begin April 1 and continue, according to the makers' statement, at the rate of fifteen per day.



DETROIT'S LATEST PRODUCTION—THE BRUSH RUNABOUT.

INTERNATIONAL BALLOON RACE, OCT. 19.

At a meeting of the Aero Club of America held Tuesday afternoon, October 19 was confirmed as the date for the international race at St. Louis, and some of the details were arranged. Nine countries will be represented, and a committee was appointed to name three Americans to defend the cup; its report is to be handed in before February 20. A valuable prize has been offered for an aeroplane through the club by a wealthy American, and the former will draft the conditions under which it is to be competed for.

NEW INTERNATIONAL CONTESTS ARRANGED.

The Paris to Madrid tour, announced with a great beating of drums a few weeks ago, has been abandoned by the A. C. F. Instead will be held a 2,500-mile tour for runabouts of the doctor's type, two or four-cylinder, 12-horsepower, to average 150 miles a day at a speed of 19 miles. Also a commercial vehicle competition for both light and heavy cars, over the same distance. The tour will be held around Paris, penetrating more into the industrial east and north than into the agricultural communities of the south and west.

THE HON. C. S. ROLLS RETURNS TO ENGLAND.

After a three months' visit to the United States and Canada, the Hon. C. S. Rolls returned to England this week by the *Kaiserin Augusta-Victoria*. Interviewed by *THE AUTOMOBILE* correspondent, Mr. Rolls said he did not expect to be back in America until the month of October, probably one week before the balloon race at St. Louis, in which he will form one of the British teams. He will bring with him the *Britannia*, a 77,750 cubic feet balloon, built by Short Brothers, of London, last year, with which he won third place in the first Gordon Bennett race and remained in the air longer than any of his competitors. Mr. Rolls has formed a company in New York under the title of the Rolls-Royce Import Company, to handle his British-built machines. Two six-cylinder models only will be sold in the States; the four-cylinder type which won the Tourist Trophy in the Isle of Man has been sold out, and it has been decided not to continue its construction. In Canada, where Britishers enjoy a preferential tariff, Mr. Rolls believes that good business will be done. In the United States importers have greater difficulties, American machines having enormously improved during the last two years, though in the opinion of the Englishman they are still built too light.

HOW TO CLEAN AN AUTOMOBILE.

There is some excellent advice given by John T. Stanley, manufacturer of "Mobo," and though he naturally talks about his own preparation his advice has a general application. These are the directions which he gives:

As soon as the car comes in from a run play water from a hose all over the varnished surface. Then let the car stand some minutes, so that the water can penetrate and soften the mud spots. Now use the hose again, playing the water on hard, so as to wash off all the heavy mud and grit. Do not use a sponge, as it will spread all the grit particles over the varnished surface and scratch and mar its luster. Dissolve enough Mobo in water to turn the liquid to a bluish color and to a soft and soapy consistency. Apply the solution to all the varnished surfaces of the machine with a clean sponge, giving a little extra rub to the very dirty and badly stained spots. Then rinse off at once with clear water before the solution dries. After this, dry all the varnished parts thoroughly with a clean chamois.

Do not clean the body of the car with the same sponge used for the wheels and gearing, as in cleaning the latter more or less grease collects in the sponge, and when brought in contact with the highly varnished parts of the car has a tendency to give it a cloudy and smeared appearance.



LOCOMOBILE FOLDING AND REVOLVING SEAT IN POSITION

AN INGENIOUS LOCOMOBILE FOLDING SEAT.

Practical tourist requirements have been kept in view by the designer of the two folding seats shown in the accompanying cuts on a Locomobile car. The seats are the revolving type with upholstered seats and backs. They are peculiar in that all parts, even the irons holding them in place, may be quickly removed and stored on the car in a special compartment designed for the purpose. On touring cars, where space is often needed for dress suit cases, etc., this is a most sensible arrangement. These seats are practically as comfortable as Pullman chairs, but if there is any difference it is more than compensated by the great advantage of being able to get rid of them when they are not wanted.

LONG-DISTANCE TRAVEL BY MOTORCYCLE.

Stanley Bowmar's trip from Buffalo, N. Y., to San Francisco, Cal., on a three-horsepower spring frame Merkel motorcycle having come to a successful termination, the intrepid rider will very shortly set out on another long journey, visiting Los Angeles, Pasadena, San Diego, etc. Mr. Bowmar has taken up the Merkel motorcycle agency on the Pacific Coast, where, thanks to the good roads and favorable weather conditions, motorcycling is in high favor. After spending some time in California Mr. Bowmar expects to depart for his home in New Zealand, in which country he will do further traveling by motorcycle.

The Locomobile line for the coming season shows no more vital change than the general use of annular ball-bearings, of the Hess-Bright silent type, practically everywhere except in the motor. This car had plain bearings throughout as recently as last year on some of the models.



LOCOMOBILE SEATS FOLDED INTO COMPARTMENT.

NEWS AND TRADE MISCELLANY.

Philadelphia's original automobile show promoter, H. D. Le Cato, is to get into the game again, having announced a Sportsmen's and Motor Show at the Horticultural Hall, in that city, for March 6-9.

The Cornish-Friedberg Company, of Chicago, is preparing to put on the market a 16-horsepower shaft-driven runabout. This car was especially designed by Mr. Friedberg to meet the growing and popular demand for a car of this type.

The Holland Launch & Engine Company has been organized at Holland, Mich., with a capital stock of \$15,000 for the purpose of making boats and motors. It will occupy the plant formerly used by the Wolverine Company, which has moved to Bridgeport, Conn.

W. W. Campbell, director of Lick Observatory at the University of California, has ordered a Rambler to be used in passing to and from the observatory on Mt. Hamilton. The grades are long and steep, and a more rapid and convenient means of transportation than horses has been for some time desirable.

T. C. Whitcomb, of Cleveland, has formed the Cleveland Auto Livery Company. The new concern will handle the automobile livery business which heretofore has been a branch of Mr. Whitcomb's agency business. Mr. Whitcomb has made a success of the livery business by using good rigs and employing competent drivers.

J. M. Quinby & Co., of Newark, N. J., have completed an extensive addition to their plant, and are installing a complete repair shop for overhauling high-grade cars. This new branch of the business will be under the supervision of Robert Richards. Quinby & Co. will carry in stock at all times a full line of high-grade chassis of the Renault, Fiat, Panhard and Simplex, fully equipped with Quinby aluminum bodies.

Among the Pittsburg companies which were represented at the recent New York show were these: American Automobile Company, Auto Repair Company, D. P. Collins Company, Ft. Pitt Automobile Company, Hiland Automobile Company, Iams Motor Company, E. F. Nevin, Schenley Automobile Company, Standard Automobile Company, Union Automobile Company, Winton Motor Carriage Company and Wilkinsburg Automobile Company.

Tennant Motor, Limited, is the new title for the Northern Motor Car Company, of Chicago, agents for the Peerless and Northern lines. W. G. Tennant has succeeded W. J. Boone as president of the company, and A. G. Brown succeeds K. G. Conway as treasurer. Martin E. Hon remains as secretary, and Clinton Hunter will continue in the position of sales manager. The company will also handle the Mercedes, which Mr. Tennant represented.

To such an extent has the business of the Liberty Automobile Company, Pittsburg agents for the Wayne, grown that larger quarters have become imperative. Work has already begun on an addition to the present quarters at 138-140 Beatty street, East End, which, when completed, will give a frontage of 80 feet and a depth of 110 feet. The new structure, which will be absolutely fireproof, and contain all the features that go to make up a modern sales and storage room, is to be completed March 25.

That outdoor automobile shows are profitable is proven by the statement just

completed of the open-air show and carnival held at the Empire track in New York last May by the New York Automobile Trade Association. The profits permit a dividend to the exhibitors of almost twenty per cent., and checks are now being mailed to the exhibitors by the show committee. There is talk of having another show this spring when the selling season is at its height, but whether Empire track will be the location has not been decided.

The Barndt-Johnston Auto Supply Company, of Columbus, O., is erecting a large addition to its plant on Donaldson street to take care of its rapidly increasing business. The new building will be 50 by 100 feet in dimension and will about double the capacity of the plant. The company was incorporated about a year and three months ago with C. Chris Born, president; W. R. Johnston, vice-president and general superintendent; Louis P. Hoster, treasurer, and Charles F. Barndt, secretary and general manager. The company manufactures all kinds of automobile bodies, tops, glass fronts and other accessories.

A novel and at the same time very practical way of demonstrating the value of the Hotchkiss shock eliminator was inaugurated by Mr. Hotchkiss at his exhibit in the recent Madison Square Garden show. A full-sized cinnamon-colored "Teddy Bear" was placed in a seat suspended above a set of carriage springs fitted with the Hotchkiss shock eliminator. The springs were strongly depressed and suddenly released, but so gentle was the recoil that Mr. Teddy hardly budged in his seat. When the shock eliminator was taken off, and the same process gone through with, Teddy Bear took a long jump skyward.

In the recent Denver-Colorado Springs speed and reliability run the winning car, a 24-horsepower Premier touring car, driven by M. B. Fechter, covered the 80 miles in two hours and twenty-eight minutes, which is an average speed of 32 4-10 miles per hour, eleven minutes better than its nearest competitor. Since the railroad schedule time to the same point is three hours and fifteen minutes, it is noteworthy that the automobile has a big margin to the good. Excepting the run to Littleton, ten miles south of Denver, it is a prairie road to Colorado Springs, through deep arroyos or sharp ravines washed out by the terrific rains. There is a constant rise in the run of 45 miles from Denver to Palmer Lake.

J. B. Herreshoff, the world's greatest speed boat designer, who, though sightless, came down from Bristol, R. I., to get in touch with the Automobile Club of America's show, through the marvelous perspective faculties of his fingers, was accompanied by Mrs. Herreshoff and his son Harold, who acted as his guide. At the Cleveland booth he stopped and passed his facile fingers over the car, following the lines of the fenders, the shape of the seats, and upholstery and the taper bonnet. Standing on the low platform, he remarked that the tires were .36 inches, after feeling their height; but, as he stepped back off the platform, he said: "Oh, no, they are only 34 inches, because your platform is two inches high."

RECENT TRADE REMOVALS.

Wednesday, January 23, the new Philadelphia salesrooms of the Autocar Company, at 249 North Broad street, were formally opened. Over 2,000 invitations were issued.

The Rutland Machine and Auto Company, of Rutland, Vt., has removed from West street to 55-61 Wales street, where they have fine new quarters with every modern improvement, and 10,000 square feet of floor space.

The Boston branch of the Studebaker Automobile Company is now occupying part of the store at 15 Berkeley street, for some years the headquarters in the Hub for the Locomobile. About February 1 the Locomobile branch will be removed to Newbury street, near Massachusetts avenue, and the Studebaker will occupy the Berkeley street store.

The George H. Lowe Company, Boston agents for the Aerocar, will be located at 509 Tremont street, the other end of the store facing at 4 Warren street. The location is a well-known one in the automobile trade, having been occupied by the White Company for a number of years prior to the removal of that company's Boston branch to Newbury street.

NEW AGENCIES ESTABLISHED.

John H. Bawden, Jr., will handle the Rambler line at Freehold, N. J., during the coming season.

Pardee & Canary have secured an agency for the Renault car for Chicago, through E. Lamberjack & Co.

Francis B. Morris, 258 North Broad street, Philadelphia, has secured the local agency for the Aerocar.

The Krueger Manufacturing Company, 56 Biddle street, Milwaukee, has taken the Wisconsin State agency for the Premier.

H. A. Knease & Sons have secured the agency for the Rambler for Iowa City, Ia. They will also open a garage in connection with the business.

The Grout Brothers Automobile Company, of Orange, Mass., has placed an agency in the city of Pittsburg, Pa., in the hands of the Central Auto Company, Ltd., 5489 Central avenue.

Smith & Mabley, Inc., appointed the following agents for their line during the recent Madison Square Garden show: Dudley Riggs, for the State of Connecticut; George C. Miller Carriage Company, for Cincinnati, O.

The Anderson Auto Company, of Greenville, S. C., has secured the agency for the Reo and Rambler. The concern is a new one and has opened a garage and salesroom on West Whitner street under the management of J. C. Stribbling, Jr.

William G. Bell, formerly salesman for the Woods Motor Vehicle Company, has taken over the Chicago Auto Garage Company's property, 3210 North Clark street, and will act as north side agent for R. M. Owen & Company, representing the Reo and Premier in addition to doing a general garage business.

The Holmes-Schmidt Motor Company, of Chicago, has been reorganized, O. P. Schmidt retiring to give his entire attention to the construction of the new Marathon car. C. H. Martin has joined the former firm, which will be known as the Holmes Motor Company and will handle the Welch and the Queen.

Competition in electric vehicles has been further enhanced in Chicago by the opening of an agency for the Baker electrics with headquarters at 1413 Michigan avenue, formerly occupied by the Cassaday-Fairbanks Manufacturing Company. G. R.

Pierce and N. G. Isbell are interested in the agency; J. S. Gorham will act as electrical engineer and sales manager.

The Brazier Automobile Works, of Philadelphia, has established a sub-agency for the Marmon car at Wilmington, Del., with the Motor Car Repair Company. The Spencer-Wilkie Motor Co., which represents the Jackson and Glide cars in the Quaker City, has established a sub-agency in Chester, Pa.

The Standard Brake Company, 101 West Sixty-sixth street, New York, has concluded negotiations with the National Brake & Clutch Company, of Boston, Mass., whereby it has become the sole representative of that company for the United States, covering the use of cork inserts in brakes and clutches for automobiles. Among the twenty-two companies that have adopted cork inserts are such representative manufacturers as Thomas, Rainier, Stevens-Duryea, Knox, Pierce and Nordyke & Marmon. An equitable form of license has been prepared for those companies desiring to manufacture.

PERSONAL TRADE MENTION.

Everett K. Barnes, formerly in the automobile business in Rockford, Ill., has purchased an interest in Pardee & Canary, Chicago.

H. B. Sands has discontinued his active interest in the Plaza Automobile Company, of Brooklyn, and has just joined the selling staff of Smith & Mabley, Inc.

L. M. Cotton, formerly representing the St. Louis Motor Car Company in Boston, has been placed in charge of the Chicago branch of the company, with headquarters at 1223 Michigan avenue.

Robert J. Schmunk, formerly with the White Company's Boston branch, has been appointed assistant manager of the Buck & Price Company, New England distributors for the Rainier car, at 901 Boylston street, Boston.

W. S. Littell, formerly with the experimental department of the Winton Motor Carriage Company, at Cleveland, has gone West and assumed charge of the repair department of the Broadway Automobile Company, at Seattle, Wash.

C. W. Wyckoff, of Wyckoff, Church & Partridge, New York City, is taking a few days' rest at Atlantic City. Mr. Church has gone to Ormond for the races, and Mr. Partridge will take a short respite from business at Lakewood, N. J., in the immediate future.

James Joyce, formerly superintendent of the American Locomotive Automobile Company's plant at Providence, R. I., has just received the appointment as manager of the Albert Frank & Company, with headquarters at the garage, 1886 Broadway, New York City.

O. E. Child has been elected secretary of the Deere-Clark Motor Car Co., Moline, Ill., to succeed C. F. Drury. The company's new directors are C. H. Deere, W. E. Clark, C. H. Pope, C. E. White, A. R. Ebi and A. E. Montgomery. Messrs. Deere and Clark are president and vice-president, respectively.

Thomas Midgley, for the past year president of the Hartford Rubber Works Company, will at a very early date take up, in addition to his other duties, the important position of general consulting engineer to three tire companies—the Hartford Rubber Works, Morgan & Wright and the G & J Tire Company.

NEW TRADE PUBLICATIONS.

"Hawthorne Works" is an illustrated and descriptive booklet published by the Western Electric Company describing their new 110-acre plant at Hawthorne, Ill. Electric power apparatus and switchboards up to and including the largest sizes for street railway service are now a feature of the company's output.

Exceedingly useful hints on the care of solid rubber tires are included in the handsome booklet entitled "Economy in Motor Tires," issued by the Firestone Tire & Rubber Company, Akron, Ohio. These suggestions have been compiled with the personal co-operation of the largest motor tire users in New York and other cities. The subject matter on "Economy in Repair" is also interesting.

Adam Cook's Sons, 313 West street, New York City, the only makers of "Albany Grease," have just issued a new booklet dealing with automobile lubrication. The text is interspersed with drawings showing just how Albany grease is applied in packing compression cups, transmission gears, etc., of interest to everyone who appreciates what an important feature lubrication has become in the economical running of the automobile.

RECENT INCORPORATIONS.

Spartanburg Automobile Company, Columbia, S. C.; capital, \$5,000. Incorporators, F. L. Bryan, Charles Parker and others.

Pullman Automobile Company, Chicago, Ill.; capital \$2,500. Incorporators, Charles O'Brien, H. L. Burnette and J. A. Burt.

Aurora Motor Works, Aurora, Ill.; capital, \$30,000. Incorporators, James Selkirk, William George and Theodore Worcester.

Thomas Spark-Plug Company, New London, Wis.; capital, 5,000. Incorporators, J. F. Thomas, H. J. Bollinski and R. N. Van Doren.

Klink Motor Car Manufacturing Company, Dansville, N. Y.; capital, \$400,000. Directors, F. R. Driesbuch, N. Uhl and E. O. Hoffman, Dansville.

Portland-Rockland Automobile Company, Rockland, Me.; capital stock, \$10,000. Promoters, John A. Lester, Howard A. Sanborn, Percy M. Andrews.

Bond Bros. Co., Portland, Maine; capital, \$10,000. To make and deal in automobiles. Pres., G. A. Hutchins; treasurer and clerk, C. H. Tolman, Portland.

Devac Auto Company, East Orange, N. J.; capital \$500,000. To manufacture motors, automobiles, etc. Incorporators, F. C. Ferguson, Charles O. Geyer and A. W. Candit.

H. Bocker Company, Bronx, N. Y.; capital, \$5,000. To manufacture boats, engines and motors. Incorporators, William F. Wahrenberger, Henry Bocker and Elizabeth Caron.

Oakland Auto Livery Company, Oakland, Cal.; capital stock, \$25,000. Incorporators, J. W. Hoag, C. B. Newman, W. R. C. Jenks, Edwin H. Pendleton and Rodney Wilson, all of Oakland.

Victor Automobile Manufacturing Company, St. Louis, Mo.; capital, \$2,500. Incorporators, Robert Horne, Grace Horne, Julia H. Harrington and Joseph F. Harrington.

Rahler Motor Car Company of Illinois, Chicago, Ill. To manufacture and deal in vehicles; capital, \$20,000. Incorporators, John T. Rahler, Paul N. Lineberger and Edward Q. Corder.

Austin-Hutcheson Company, New York City; capital, \$5,000. To manufacture automobiles and carriages. Incorporators, Howard B. Hutcheson, Louis C. Hutcheson, Carol F. Hutcheson, New York.

Okey Motor Car Company, Columbus, O. To manufacture automobiles and engines; capital, \$25,000. Incorporators, Perry Okey, Campbell Chittenden, F. M. Hoover, H. T. Stewart and H. E. Walton.

NEW FEATURES FOR JONES.

The 1906 model of the Jones speedometer was accepted as a most perfect speed indicator. In the Automobile Club of Great Britain and Ireland's reliability contest it finished with an absolutely clean slate and won the club's gold medal or highest award. The 1907 models are practically the same in construction and design as those of 1906. A new and valuable feature adding largely to the value of the Jones is the addition of a second maximum hand. In using two hands one is placed directly above the other as in a stop-watch. The upper hand is black, the lower red; each move independently of the other. The black hand indicates the exact speed at all times, changing with every change of speed and is permanent at that point, until changed by a touch on the resetting stem which is provided for that purpose. If a car is traveling at 25 miles per hour, for instance, the red hand indicates



JONES SPEEDOMETER FOR 1907.

25 and stops at that point. Now the car reduces speed to 10 miles per hour—the red hand remains at 25—the black returning to 10.

If an officer should signal the automobilist to stop while traveling at say 12 miles per hour, by a simple press on the button, the red hand instantly flashes to the speed at which the car is traveling and remains there—it does not return to zero. Here is proof and proof positive that the speed limit has not been exceeded and Mr. Autoist continues on his way. Heretofore the indicating hand returned to zero when the car was not in motion and arguments were practically always settled in court.

The second or red hand will also prove invaluable to the manufacturer for "try-outs." Cars are frequently sold to enthusiasts on a guarantee that they will "do" a certain speed. By use of this new instrument the red hand will indicate the highest speed and stop at that point. If at any time one should not want to use the red hand, by a simple turn of the resetting stem it is made possible for both hands to move together.

Of course, the instruments retain the odometer register; both trip and distance. The former registers distance to 100 miles; the latter to 10,000 miles; the "trip" is provided with an instantaneous re-setting stem—an exclusive feature claimed for the Jones instruments.

INFORMATION FOR AUTO USERS.

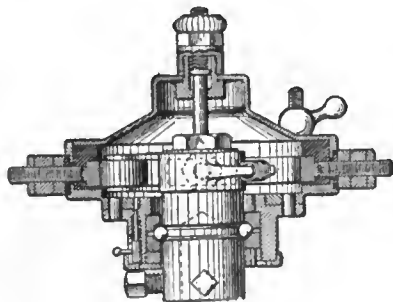
The Fry Adjustable Plug.—The spark plug handled by the T. C. & W. L. Fry Company, Rochester, Pa., is so constructed that it can be readily adjusted without removing any part from the cylinder.



FRY PLUG.

point in a vertical line, giving the hottest spark on the least amount of current.

Wipe Contact Timer.—To meet a demand for a good wipe contact timer the Uncas Specialty Company, Norwich, Conn., has improved upon the standard types of timer by adding a supplementary ground terminal and an adjustable ball bearing in place of the plain bearing.



A BALL-BEARING TIMER.

which will cause skipping when running at high speeds. The above faults are usually ascribed to the plugs, coils or carbureter.

New Type Steering Gear.—A new form of steering gear likely to meet with much success among automobilists has been put on the market by the Briscoe Manufacturing Company. Its features are very slow acting for straight ahead running with increased rapidity of movement as the steering wheel is turned over.

ing column. The internal gear is five-sixths of the diameter of the external gear and gives almost a surface contact, three teeth being always fully in mesh. A cam on the steering spindle fits into a hole through the center of the internal gear, which is pivoted to the casing, and drives it round the external gear by an eccentric movement.

Abell Speed-Meter.—All the parts in this speed indicator are concentric and work about a common center. The indication is shown by means of a pointer and dial similar to a clock, the hand making three-quarters of a circle before it reaches the end of the scale, which is 65 miles on a standard instrument and 100 miles on a special size. The hand is mounted on the top of a stem or pivot on the lower end of which is mounted a cup shaped shell lined with fiber and polished on its inner face, which serves



THE ABELL SPEED-METER.

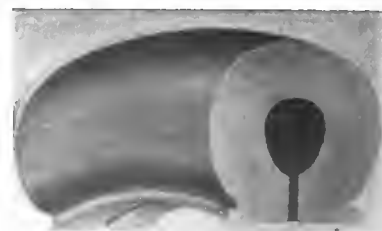
as a race-way for four small weights in the form of cylinders. These weights are mounted loosely in drilled holes in the rim made disk which revolves about a stationary ball bearing stud and is driven by the flexible shaft. They are provided with polished glass friction points which after a great deal of experimenting, is found to be an ideal material for this use. When the machine is at rest the weights lie idle in their sockets without exerting any outward pressure, but immediately on rotating the disk carrying the weights, the weights themselves begin to move, fly out and press against the polished face of the friction cup. The sliding contact thus set up immediately starts the friction cup in motion, but as it is retarded by a spiral spring, it moves only as far as the friction set up by the centrifugal pressure of the weights will carry it.

The odometer used in connection with this instrument is of standard make and is driven with a small worm and gear by the same shaft that revolves the weights. The instrument is mounted on a pivoted bracket which can be fastened by screws to any convenient part of the dash board,

and can be set at the proper angle so that it may be easily read from the seat. It is manufactured by the E. T. Kimball Company Motor Mart, 87 Church street, Boston.

Putnam Motors.—An interesting series of small four-cycle motors, air cooled and water cooled, with one, two, and four cylinders, is manufactured by R. H. Putnam, of 57 Lebanon street, Springfield, Mass., and castings and blueprints for making these motors are sold also. The list includes a 21-4-horsepower motorcycle motor, with 2.3-4-inch bore and 3-inch stroke, listed at \$40; a double cylinder motor, with cylinders of the same size, placed at an angle of 60 degrees, rated at 41-2 horsepower and listed at \$70; a four-cylinder 10-horsepower motor, with cylinders set at 60 degrees, built to order only; a 2-horsepower, single cylinder, water-cooled marine motor at \$47.50; and a 4-horsepower motor of the same type costing \$75. The list of built-to-order motors also includes an 18-horsepower, air-cooled, and a 28-horsepower, four-cylinder, water-cooled motor. The Putnam motors all have outside flywheels and valves in cylinder-heads operated by long push-rods.

A Puncture-proof Tire.—One solution of the tire problem appears to have been solved by the Puncture-proof Tire Company, 707 American Trust Building, Cleveland, Ohio. The general form of this new tire is indicated by the cut herewith. Best up-river Para rubber, compounded, is used for the body of the tire; the central air space and slit to the base of the tire being lined with layers of friction cloth, coated with a thirty-second of an inch of rubber between the layers of friction for the purpose of giving the tire strength and preventing any tendency of the rubber to crack. The clincher and the lower part of the outside of the tire immediately above the clincher also has layers of friction, covered entirely with rubber. The superior advantage claimed for this tire are a resilience equal to that of the pneumatic, and an entire absence of punctures and their resulting accidents and expense. To fit the puncture-proof tire, the wheel is jacked up and one side of the tire placed in the clincher all the way round; the sewed side is forced in by means of a machine built for that purpose. Thus held, they form a perfectly solid base between the clinchers, but as a further precaution, steel pins are placed in the base through the bead or



CROSS-SECTION PUNCTURE-PROOF TIRE.

clincher of the tire, an inch and a half apart alternating on either side. The puncture-proof tire was on exhibit at Madison Square Garden, but was unfortunately omitted from our account of the show through inadvertence.

THE AUTOMOBILE

VOL. XVI

NEW YORK—THURSDAY, JANUARY 31, 1907—CHICAGO

No. 5

THE CHICAGO SHOW: ITS ORIGIN AND GROWTH

Exhibition Opening Saturday Next and Concluding February 9 Will Contain More Car Exhibitors Than Any Preceding

BY S. A. MILES, GENERAL MANAGER NATIONAL ASSOCIATION AUTOMOBILE MANUFACTURERS.

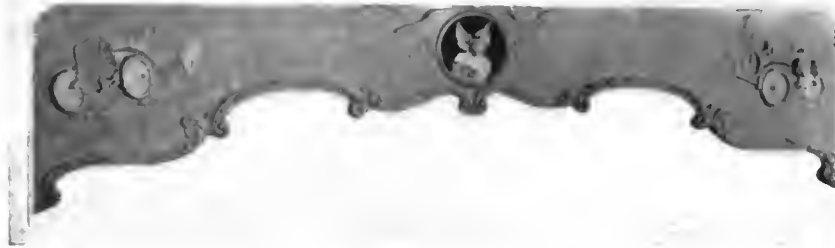
AN attempt to outline the history of the Chicago Show of necessity recalls events which, while now regarded by the victim as an excellent joke, were at the time anything but amusing experiences, and required the exercise of the utmost pertinacity on the part of the promoter in overcoming the difficulties presented in those unsettled pioneer days of the industry.

The first show held in the Windy City was an outdoor affair, conducted at Washington Park, on whose classic track Alexan-

der Winton and other celebrities of the racing world of that day performed wondrous feats, considering the development of the automobile at that time, and others undertook performances on movable platforms and other apparatus, designed to impress the public with the idea that the automobile could climb steeples and turn somersaults in the hands of experienced operators. But for reasons into which it is unnecessary to enter, the show was anything but a success. This event, by the way,



AT NIGHT IN FRONT OF THE BIG COLISEUM DURING THE CHICAGO AUTOMOBILE SHOW WEEK.



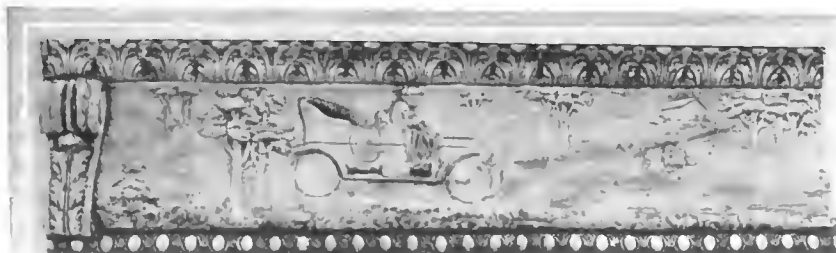
ARCH REPRESENTING DIVIDING LINE BETWEEN MAIN SPACES.

had no connection with the later one promoted at the Coliseum, which has become, after seven years of experience, at least as important as any automobile show held in the United States.

In the days of the cycle trade's glory the owners of a number of journals devoted to that sport, and published in Chicago, promoted a number of immensely successful affairs. By the time the cycle craze died, and the automobile had commenced to take its place, these same gentlemen had formed a combination for the publication of a journal devoted to the new form of locomotion, and their experience naturally led them to undertake the promotion of an automobile show. They were troublous times, however, for the field of automobile journalism was necessarily limited, so that, by the time the show plans actually matured, only one member of the combination remained to persevere, though thick and thin—the same individual, by the way, who has conducted the Chicago show ever since, and apparently intends to remain in harness so long as automobile shows endure.

The plans of the promoter of the first Chicago show held at the Coliseum seemed to be progressing with reasonably fair prospects when, during the New York show of the fall of 1900, the National Association of Automobile Manufacturers was formed. One of the first things the executive committee did was to adopt a show resolution, which was practically an instruction to its members to take no part in the Chicago event. The promoter of the show finally succeeded in bringing about a special meeting of the committee, and, by convincing them that Chicago's importance as an industrial center and possible automobile market had been underrated, secured the passage of a new resolution which, however, prescribed that all automobile shows thereafter held must be conducted under the auspices of automobile clubs. The automobile club was a far more important institution in the eyes of the few manufacturers of that day than it is at present.

The management of the first Chicago show practically assured the future success of that event by doing one thing which no one



A SECTION OF THE ORNAMENTAL DECORATIVE FRIEZE.

else had previously thought of. Experience with the cycle shows had taught that the man to be appealed to, at that time, was the automobile agent or the person who aspired to become one. Strenuous efforts were therefore made to secure the attendance of men of that class.

From the standpoint of the promoter the show was anything but a success, but from the standpoint of the exhibitors its success was unqualified. One factory, then producing steam cars, sold more than it was able to produce that season.

For weeks prior to the opening of the show the question with the management was not whether it would be possible to get a large number of exhibitors, but whether it would be possible to beg or to borrow enough cars to make a presentable showing. The huge floor of the Coliseum was encircled by a track about twenty feet wide, and by dint of more or less maneuvering the center was finally fairly well filled with an exhibit which to-day might appear to have been produced by the makers of half a century ago. The dealers were there in force, the public at-



FIRST REGIMENT ARMORY, WHICH WILL ALSO BE USED FOR THE SHOW.

tended in sufficiently large numbers to indicate the growing interest, and, despite the financial loss, the event was voted by the exhibitors who participated to have been a highly successful affair, as the prospects were brilliant.

The mandate of the National Association was obeyed to the letter. The second show was held under the auspices of the Chicago Automobile Club, with which organization the promoter concluded a satisfactory arrangement. It is almost impossible to make a comparison between the first and second shows. The main floor of the Coliseum was well filled, and the financial loss of the previous year became a satisfactory gain. The third, fourth and fifth shows showed steady progress. In the third it became necessary to place makers of parts and accessories in the Annex; in the fourth the gallery was added to the exhibition space by flooring over that portion usually devoted to seating. In the fifth the second floor of the Annex was used, which helped to relieve the congestion.

When the time for allotment arrived last year it became evident that a large number of exhibitors must be denied space or more room must be secured. The demand was so far in excess of the supply that it would have been impossible to give each manufacturer room enough to display even a small part of his exhibit. About a hundred yards from the Coliseum, and divided from it by a public alley, stands the First Regiment

Armory. After a great deal of tribulation and settlement with other organizations who had leased it for the same dates as the automobile show, this building was secured and the space was divided, as fairly as possible, among the eighty exhibitors of cars. The gallery encircling the Armory was given up to accessories. Even with this addition, despite the fact that the total floor space available for exhibits was nearly 80,000 square feet, it was still impossible to take care of every one, or to give any exhibitor as much space as he would have liked, in consequence of which a part of the second floor of the Coliseum Annex, previously sacred to the accessories department, was used for the exhibition of automobiles.

This year there was no room for extension, but a few exhibitors who had been unable to secure space discovered a couple of small balconies and requested to be allowed to exhibit therein. This space has already been allotted.

The public interest has kept pace with the production and demand for space by the manufacturers. Without going into the details of attendance, it may be noted that last year the receipts from all sources were little over 50 per cent. greater than in any earlier year, and that so far as could be gathered not less than one hundred and twenty-five thousand people attended.

The conduct of the Chicago show no longer entails any question about financial returns. An endeavor has been made each year to reduce the cost to the exhibitor. The space rental was reduced in 1906, and has been reduced again for 1907. It is estimated, too, that the plan of uniform decoration resulted last year in a saving to the trade of not less than \$50,000.

The efforts of the management are devoted to the presentation of an exhibition which shall be second to none. In the matter of exhibits the attainment of this object is now beyond question. The Chicago show is the first and only national event in which cars of all classes, licensed and unlicensed, are exhibited together. The result is that the number of automobile exhibits is far in excess of that at any other show, the exact number booked for the coming show being 104.

Whether the scheme of decoration and the general setting are equal to those employed at Madison Square Garden is, and must remain, a question to be settled by those people who have an

opportunity to see both. Last year opinions were divided. The plans were so entirely different that the question was one merely of taste. The setting at Chicago this year will be chiefly of staff, and therefore somewhat more massive than that at New York. Pictures and statuary will be used to some extent, but in an entirely different way. One feature of the decoration worth attention is that it relates directly to the automobile industry.

The policy of paying particular attention to the dealers has been consistently followed through all of the Chicago shows. The management recognizes the fact that the shows at New York and Chicago are no longer national in the sense that they once were. Time was when dealers were scarce and independent; when they made their annual pilgrimage to the shows for the purpose of placing their orders for the season. That has all passed. Ninety per cent of the dealers now place their orders long in advance. The shows have, therefore, become, to a great extent, local shows. The dealers attend them in just as large numbers as ever, and they attend the Chicago show in greater numbers than any others, bringing with them prospective customers from all parts of the country.

To the average New Yorker many of the Western dealers are objects of curiosity. They waste no time. During the week hundreds of them, arriving in Chicago by early trains, make their way to the Coliseum without as much as depositing their baggage at hotels, and make demands for admission to the building as early as 8 o'clock in the morning. Before half of the exhibits have been uncovered many a dealer will have spent a couple of hours quietly inspecting the cars before the rush of the day.



MEDALLION DECORATIVE FEATURE.

LOCAL SHOW PREPARATIONS IN VARIOUS CITIES.

BUFFALO'S SHOW PROMISES SUCCESS.

BUFFALO, N. Y., Jan. 28.—Indications at this time point to a successful automobile show for Buffalo in Convention Hall, beginning three weeks from to-day. The management is again confronted with the very serious proposition of making room for all who desire exhibition space, and has been again compelled to cut up the two restaurants at the right and left of the main entrance for the purpose of utilizing them for exhibition purposes. This means that the restaurant will be upstairs during the show. Since the first allotment of space on January 10 several applications from automobile manufacturing companies have been received. Secretary D. H. Lewis is doing his best to satisfy every exhibitor at the show. Concerts will be furnished every afternoon and evening by the Sixty-fifth Regiment Band. Much attention will be paid to the decorations. It has been decided to have the color scheme one of green and white, making a garden effect of Italian characteristics.

DATE SET FOR SAN FRANCISCO SHOW.

The week of February 18-25 has been selected for the first automobile show to be held in San Francisco. It will be promoted by the Automobile Dealers' Association, whose headquarters are at 426 Golden Gate avenue. The Golden Gate Park Skating Rink is the building which will be employed to house the show.

GOOD OUTLOOK FOR PITTSBURG SHOW.

PITTSBURG, PA., Jan. 28.—Nearly \$30,000 worth of space has already been contracted for at the automobile show to be held at the Duquesne Garden in Pittsburg in April. Offices of the show committee have been opened at the Automobile Dealers' Association, under whose auspices the show will be held, at 5917 Baum street, East End, with John P. McCrea in charge. Advance indications point to one of the most successful automobile events ever held in this country.

WESTERN MAKERS TO EXHIBIT IN BOSTON.

BOSTON, Jan. 29.—Interest will be lent to the power boat section which is to be a more prominent feature of the Boston show this year than ever, by the fact that many of the Western manufacturers who will have elaborate exhibits at the Chicago show to be held March 2-9, will duplicate them at the Hub. Greater efforts than ever are being put forth to make the show as a whole the greatest that New England has ever seen.

CLEVELAND PROMISES A BIG EXHIBIT.

Ten days after the close of the Chicago show, Cleveland will put on its annual event, which will be held in the Central Armory along the same lines as last year, except that more elaborate preparations will be made and a larger exhibit staged. The show will open on February 18 and remain open until the 23d.

WASHINGTON'S AUTO SHOW IS OPEN.

WASHINGTON, D. C., Jan. 28.—Resplendent with a multitude of electric lamps, the Dupont garage on M street was thronged with people to-night to witness the opening of the seventh annual show of the Washington Automobile Dealers' Association. They had the pleasure of seeing the most representative collection of cars ever exhibited in Washington, and they lost no time in making the circuit of the two floors of the garage in order to become acquainted with the 1907 models. Washingtonians are getting automobile wise, a fact that impressed every agent. The latter were not bored with a lot of fool questions, as at previous shows, for even the casual visitor had a good working knowledge of automobile construction, and talked intelligently on the subject.

THE AUTOMOBILE correspondent counted 58 cars on the two floors of the garage, 27 different makers being represented. While the number of cars exhibited is somewhat smaller than last year, more makers are represented than ever before. Brisk sales marked the opening night, and it is quite evident from what was done to-night that the show is going to result in good business. The Capital City seems to be in a buying mood, and the agents have been quick to seize upon the opportunity.

The battle-scarred Thomas racer used by Le Blon in the last Vanderbilt cup race, and a Locomobile racing machine, are two interesting features of the show. Both were towed through the streets of Washington this morning en route from the express company's warehouse to the show room, and they came in for a good share of attention. Washington does not have many opportunities to see big racing machines, and this accounts for the unusual interest evinced in these cars. The exhibitors are as follows:

Pope Automobile Company, of Washington; Commercial Automobile and Supply Company, Wayne; Washington Electric Vehicle and Transportation Company, Columbia; the Cook and Stoddard Company, Pierce Arrow, Franklin, White, Baker, Cadillac; Motor Car Company, Peerless, Stevens-Duryea, Thomas; National Automobile Company, Buick, Studebaker, Oldsmobile; Dupont Garage Company, Waltham-Orient; Geo. P. Sacks, Rambler, Cleveland; Chas. F. Fleming, vehicle clocks; Automobile Tire and Repair Works, tire repairs; Auto Supply and Storage Company, Holsman, Logan; Chas. C. Hughes & Co., Elmora; Carter Motor Car Company, Cartercar; Hamilton Auto Company, Stoddard-Dayton; National Electric Supply Company, tires, lamps, etc.; C. W. Hamilton, American Mercedes; Rudolph, West & Co., tires, lamps, etc.; Chas. E. Miller & Bro., Reo, Ford, Columbus electric; Electric Storage Battery Company, Exide batteries; Pennsylvania Rubber Company, tires; F. N. Cycle Company, F. N. motorcycles; J. R. Thomas, Maxwell.

BALTIMORE SHOW CLOSES ITS DOORS.

BALTIMORE, Jan. 26.—After drawing big and enthusiastic crowds to the Lyric for six successive nights the lights were turned out this evening on the second annual automobile show of Maryland, and the exhibition unanimously voted a success. Sales on the floor of the hall were not as numerous as they might have been, and as many hoped they would have been. But an automobile show is as much an evangelizing as a selling ground, and the full benefit of the public display is certain to be felt in the shape of a rush of orders during the early spring.

Family interest in the exhibits was a feature of the show; the farmers, too, who are popularly supposed to nurse a respectable amount of antipathy to automobiles, showed themselves interested in those types of machines likely to prove of use for their particular class of work. The cinematograph exhibition, with its realistic scenes from the Vanderbilt Cup race, and other automobile events always kept captive a crowd. Local opinion is in favor of holding the show on an earlier date, the beginning of December being put forth as a suitable time.

The accessory men held both sides of the hall, the main floor being occupied by the exhibitors of cars.

MECHANICAL BRANCH A. L. A. M. TO MEET.

In order to extend the scope of observation that was open to the members of the Mechanical Branch of the Association of Licensed Automobile Manufacturers at the show held by the latter in the Garden, it has been decided to hold a meeting during the Chicago Show. This will take place on February 6, at the Chicago Athletic Club, the chief object being to give the engineers an opportunity to inspect the cars of the exhibitors at Chicago who are not members of the association, as well as to compare them with those that are, as in a great many instances they will be shown side by side. The subjects to be considered will be shock absorbers and carbureters, clutches and springs, and in accordance with the plan adopted for the first time at the January meeting in this city, it has been decided to invite representatives of the leading makers of such parts. Judging from the results attendant upon the latter it is anticipated that considerable of interest will be brought to light, as the manufacturers are given an opportunity to put forth their side of a subject with which they are thoroughly familiar.

COMMITTEE'S REPORT ON THE GARDEN SHOW.

On Friday last, the Show Committee of the Association of Licensed Automobile Manufacturers met in this city to consider the results of the show recently held in the Garden, and formulate plans, based on these results, for the show next year. According to the statement of the press agent, orders to the extent of \$3,000,000 were placed during the week, of which \$937,000 were for imported cars. The records of the committee showed that the attendance for the week was 125,000. On Tuesday, which was one of the worst days of the week considering the weather, the attendance was 20 per cent. greater than for the corresponding day of the year previous despite the doubled admission fee. High water-mark was reached on Wednesday, with an attendance of 21,000. The Show Committee is of the opinion that it will be necessary to increase the general admission to \$1, and make this \$2 on one or two days of the week. Plans are already under way to increase the floor space of the Garden by an additional 15,000 to 20,000 square feet. One of the most noticeable features of the show was the decreased necessity for demonstrations to make sales, and it is thought that in the near future the matter of demonstrations will be done away with altogether.

MARYLAND AUTOISTS HAVE GRIEVANCES.

BALTIMORE, Md., Jan. 28.—Strained relations between the automobilists of this city and the police, owing to the activity of the latter in enforcing the twelve-miles-an-hour speed limit, have caused the Automobilists' Protective Association of Maryland to issue an address to the public. In it they point out the injustice and absurdity of the law, and claim that the only restrictions the State can reasonably impose upon the drivers of automobilists are those which tend to conserve the safety of the public. The police, in an effort to put a stop to reckless driving of automobiles by a comparative few, have undertaken to enforce the existing law without regard to the evident purpose for which it was intended, and in such a manner that it is no longer possible for any automobilist, no matter how considerate he may be, to use the streets of Baltimore without constant dread of being arrested for some technical or trivial violation of the law which in no way endangers the safety of the public.

The association is also having trouble with the police over the law compelling drivers of automobiles to sound their horns or sirens at all street crossings. Arrests for neglect of this rule have been numerous, and finally the Protective Association has decided to test the law. President Osborne I. Yellott contends that there is a defect in the present automobile laws of Maryland, in that the section pertaining to the sounding of horns applies to the counties only, and not to the cities.

ORIGIN AND RISE OF THE N. A. A. M.

THOUGH but little more than six years have elapsed since either shows or organizations of automobile manufacturers came into existence, the early history of both is surrounded with more or less of a haze—so much so that few outside of those who actually participated in the small beginnings that have grown so vastly can state to a certainty whether a trade organization was responsible for the first show or vice versa. But this doubt can at once be set at rest when it is recalled that during the holding of the first show in Madison Square Garden a call was issued to “manufacturers of motor vehicle supplies and accessories” to come together and formulate plans for an association “to advance and protect the interests of the trade, procure lower freight rates, more equitable legislation, protest against the adverse and unjust ruling of the Treasury Department, hold shows and exhibitions and give attention to such other matters as required attention.” These are not the exact words, though they represent more than an expression of the substance of that first notice.

Press Room, Scene of First Meeting.

In response to this call a number of manufacturers of cars and parts, and dealers in accessories assembled in the press room of the Garden on November 10, 1900. John Brisben Walker was appointed temporary chairman, and Ralph Estep temporary secretary. The organization committee consisted of S. T. Davis, Jr., Charles E. Miller, A. L. Riker, W. C. Baker, E. P. Wells, John Brisben Walker, Charles E. Duryea, J. M. Hill, Alexander Winton, C. J. Field and A. S. Winslow. By a resolution this organization committee was continued as the executive committee of the association. The chief business at this first meeting was naturally the matter of completing the organization, and to this end a committee to draft a constitution and by-laws was appointed by the chair. It was composed of A. L. Riker, Charles E. Duryea, Charles E. Miller, A. L. Winslow and E. P. Wells. At the same time the chair appointed a committee to take in hand the matter of legislation, which, even at that early day, gave promise of proving a vexatious problem. This consisted of Colonel Albert Pope, A. L. Barber, John H. Flagler, S. T. Davis, Jr., and Alexander Winton. The purposes and aims of the association were drawn up in the form of resolutions to which all intending members subscribed. Taken in the light of present-day knowledge, the list is one that mutely expresses a great deal of the history of the development of the automobile in this country. To those who are familiar with what has intervened it speaks for itself. The companies or concerns who were present individually or sent repre-



M. J. BUDLONG



THOMAS HENDERSON



WINDSORT I. WHITE



C. C. HILDEBRAND



WM. E. METZGER

N. A. A. M. SHOW COMMITTEE.

sentatives and who signed the resolutions, were as follows: The Mobile Company, Joseph Dixon Crucible Company, B. F. Goodrich Company, Charles E. Miller, Crescent Auto Manufacturing Company, The Steam Mobile Company, C. J. Downing, Goodyear Tire and Rubber Company, Winton Motor Carriage Company, Haynes-Apperson Auto Company, Locomobile Company of America, Duryea Power Company, Overman Auto Company, International Motor Car Company, Upton Machine Company, Munger Vehicle Car Company, Veeder Manufacturing Company, Gray & Davis, New York Motor Vehicle Company, Peerless Manufacturing Company, Motsinger Device Manufacturing Company, St. Louis Motor Car Manufacturing Company, Waltham Manufacturing Company, Baker Motor Vehicle Company, De Dion Bouton Motorette Company, Riker Motor Vehicle Company, Electric Vehicle Company, Knox Automobile Company, Baldwin Cycle Chain Company, and the following publications: the *American Automobile*, the *Motor Vehicle Review*, the *Cycle and Automobile Trade Journal* and the *Motor Age*.

Charter Members Still Prominent.

Considered from any point of view, such an array of interests would have formed an imposing list of charter members for any association representing an entirely new industry to begin existence with, but when taken in the light of the development of the automobile at that day, the showing is truly remarkable and reveals the demand for co-operation that must have existed.

The foresight of the organizers of the association as shown by many of the names of this original list of members, is not only justified by the remarkable development of the industry as a whole in the intervening years, but the prominence to which many of them have attained in that time. Some of the names have changed, and more have dropped out of sight altogether, but the great majority of them have always formed the foundation of the industry as well as its representative association where the builders of cars have been concerned, as well as providing a nucleus for the formation of an association of accessory makers and dealers which has since come into existence as an offshoot from the original organization.

A second meeting was held at 11 Broadway, New York, on December 7, 1900, and at this the following officers were elected: President, S. T. Davis, Jr.; first vice-president, J. H. Flagler; second vice-president, J. Wesley Allison; third vice-president, C. J. Field; secretary, E. P. Wells, and treasurer, David Walker. It was decided that the executive committee should consist of fifteen members, divided into groups of five to serve for one, two and three years respectively. The follow-

ing were elected to serve one year: S. T. Davis, Jr., Henry F. Bradbury, A. S. Winslow, Charles E. Duryea, C. B. Frayer; to serve two years, J. M. Hill, A. L. Riker, W. C. Baker, J. H. Valentine, Henry H. Flagler; to serve three years, J. B. Walker, C. J. Field, E. P. Wells, J. Wesley Allison, and Alexander Winton.

Not a little of the history of the growth and development of the automobile industry as a whole is discernible by merely running over the list showing the names of the officers of the association that succeeded each other year after year. This is particularly true of the first years of the organization's existence, when its very name was synonymous with the American automobile industry at large. For instance, at the second annual meeting for the election of officers, which was held at the office of the Locomobile Company of America, at 7 East Forty-second street, S. T. Davis, Jr., was elected president; A. L. Riker, first vice-president; C. J. Field, second vice-president, and D. E. Rianhard, third vice-president; E. P. Wells, secretary and Percy Owen, treasurer.

At the third annual meeting, which was held at the same address, on February 4, 1903, the following were elected: M. J. Budlong, president; H. Ward Leonard, first vice-president; Windsor T. White, second vice-president; Charles Clifton, third vice-president; Percy Owen, treasurer, and Harry Unwin, secretary. The fourth annual meeting was held at the Madison Square Garden during the course of the fourth annual show on January 23, 1904. It resulted in the reelection of M. J. Budlong as president; first vice-president, Windsor T. White; second vice-president, Charles Clifton; third vice-president, E. H. Cutler; treasurer, W. R. Innes, and secretary Harry Unwin. The fifth annual meeting was held at the Hotel Victoria in New York on January 18, 1905, at which the entire set of officers of the year before was unanimously reelected.

What the Association Has Accomplished.

It would be difficult to give a comprehensive review of all that has been accomplished in the past six years as the result of the coöperation of some of the most prominent manufacturers in the early days from which the national association grew. Within two years after its formal organization at the first automobile show in the Garden in this city, it lent its support to the holding of an annual show in Chicago, which has grown and flourished no less than its forerunner, as have also the shows held in smaller cities. On this account the association has been largely identified in the public mind with the matter of shows, though a vast amount of equally important work has been carried on that does not reach the public ear. For instance, four years ago a standard warranty was established and adopted, and though it has frequently been a matter for discussion, it has not been changed in any way during that time. Most of the makers print this guarantee in their catalogue, and a great many who are not members of the association have adopted it. At first sight this may appear to have been merely a measure of self-protection, and of no particular interest apart from that, nor of any far-reaching significance, but it is one of the things that reflects the moral influence that the National Association of Automobile Manufacturers has constantly wielded over the industry as a whole. Bearing in mind the rapid rise and decline of the industry that immediately preceded—the making of bicycles—every effort has been directed to avoid any tendency toward over-inflation; the boom idea has been consistently and persistently frowned down, and the members urged not to attempt to make a greater number of cars than they could make well, and in this manner the growth of the industry has been natural and on sound financial lines—a fact that is reflected in the standing of those makers who are members of the association.

Besides this, the association has interested itself in everything pertaining to the advancement of the industry generally, as well as of the interests of its members, and be it said to its credit, the latter have not been allowed to overshadow the general good. It has always taken an active interest in legislation

in any way concerning the autoist, and its policy in this respect has been consistent, in that it has exerted every effort to prevent meddling with laws that were reasonably acceptable, as well as to block the passage of unreasonable legislation in any form. Its interest has gone further than this. With the firm belief that most of the automobile legislation is based upon fundamentally wrong principles, it has instituted an action to test the constitutionality of State licenses, and has already carried it through several of the lower courts of New Jersey. It will be taken, in due course, to the Supreme Court of the United States, and even though the contention of the association be decided against, the matter of a single State license being sufficient anywhere in the country will have been passed upon at the same time, as this is also being contended for. During 1905 it lent financial aid to the proposed free alcohol legislation. In the matter of good roads also, the association has always been very active, and a great deal of benefit has resulted, and will continue to come from the work that is constantly being carried on with the improvement of the highways in all parts of the country in view. Instances of the good work that has been carried on by the association might be multiplied indefinitely, and through it all may be seen the beneficent influence that such an organization, when well managed, may wield for the good of the industry it represents.

COURT PRONOUNCES ON FOREIGN REPAIRS.

WASHINGTON, D. C., Jan. 28.—The United States Circuit Court of Appeals for the second circuit has rendered a decision favorable, in part, to the importer, in the case of *J. T. B. Hillhouse v. United States*. The case came before the court upon appeal from a decision of the Circuit Court for the Southern District of New York, affirming a decision of the Board of General Appraisers, which sustained the Collector of Customs at New York in assessing duty upon an automobile of foreign manufacture under the tariff act of 1897. An automobile owned by Mr. Hillhouse was used abroad more than one year, and was subjected to extensive repairs shortly before importation. The court held that so much of the machine as was a new manufacture (new parts, reupholstering, etc.) was dutiable, but that the rest, including the cost of overhauling, oiling, cleaning, readjusting and regulating, was free of duty under paragraph 504, as household effects used abroad more than one year.

SCHROEDER'S "DIXIE" TO COMPETE ABROAD.

Commodore Edward J. Schroeder, of the Motor Boat Club of America, has challenged last year's winner of the Harmsworth trophy, which means that the *Dixie* will compete in the international contest the coming summer. The *Dixie* is the star boat in this week's races at Palm Beach, Fla., where she outclasses all rivals in point of size and speed.

The Motor Boat Club of America has just been advised of the fact that the British race will, in all probability, be held during the first fortnight in August and the course will be inside the Isle of Wight. The course last year was a triangular one just inside Southampton waters and the same will, in all probability, be adopted for the race this year.

WHY WAGNER CARRIED AN ARSENAL.

After fourteen days in New York, Louis Wagner, the Vanderbilt victor, last week returned to his native land on *La Gascogne*. A little adventure on the eve of sailing almost caused Wagner to miss his passage. Held up by a New York policeman for speeding, the Frenchman was discovered on being searched at the police station to be the possessor of a revolver and a big knife. His explanation of the presence of the forbidden arms was that he had bought the revolver to protect a large sum of money he was carrying back to France, and the knife was one he regularly used to rip off punctured tires. Evidently the explanation satisfied the authorities, for the case was dismissed and Wagner was able to sail as he had intended.

LOCATIONS OF THE CHICAGO EXHIBITORS

ALTHOUGH such seldom appears to be the case to the casual observer, systematic arrangement and order are the keynote of every automobile show. It may look at first sight as if the exhibits were hopelessly jumbled and as if confusion reigned supreme, the only way of locating a certain exhibitor being to go on a blind hunt in the hope of stumbling across his location by dint of luck and perseverance, and generally this is the plan followed by the average seeker after information of this nature. And confusion is worse confounded when he calls others to his aid, for the query, "Where is Blank's stand?" either brings no information or much that is misleading. For this reason the appended classified list of exhibitors will be found valuable.

AMERICAN AND FOREIGN GASOLINE PLEASURE VEHICLES

Adams Co.....	First Regt. Armory, Main Floor	A3	Maxwell-Briscoe Motor Co.....	Colliseum, Main Floor	C3
Aerocar Co.....	First Regt. Armory, Main Floor	D4	Maumee Motor Car Works.....	Colliseum Annex, Main Floor	T1
American Loco Auto Co.....	First Regt. Armory, Main Floor	A4	Mitchell Motor Co.....	Colliseum Annex, Main Floor	K1
American Motor Car Co.....	Colliseum Annex, 2d Floor	128 and 135	Mercedes Import Co.....	First Regt. Armory, Main Floor	O3
Apperson Bros. Auto Co.....	Colliseum, Main Floor	E3	Meteor Auto Works.....	Colliseum Annex, Main Floor	Q1
Auburn Auto Co.....	Colliseum Annex, Main Floor	B2	Moline Auto Co.....	First Regt. Armory, Main Floor	G8
Austin Auto Co.....	First Regt. Armory, Main Floor	E4	Monarch Motor Car Co.....	First Regt. Armory, Main Floor	E8
Autocar Co.....	Colliseum, Main Floor	B2	Motor Car Co.....	First Regt. Armory, Main Floor	G1
Bartholomew Co.....	Colliseum Annex, Main Floor	O1	Moon Motor Car Co.....	First Regt. Armory, Main Floor	D3
Blomatrom Motor Co., C. H.....	Colliseum Annex,	Q1	National Motor Vehicle Co.....	Colliseum, Main Floor	F1
Biddle-Murray Mfg. Co.....	First Regt. Armory, Main Floor	G5	Nordyke & Marmon Co.....	First Regiment Armory, Main Floor	D4
Bowman Automobile Co.....	First Regt. Armory, Main Floor	G4	Northern Motor Car Co.....	Colliseum, Main Floor	F2
Buckeye Mfg. Co.....	First Regt. Armory, Main Floor	E5	Olds Motor Works.....	Colliseum, Main Floor	B1
Bulck Motor Car Co.....	First Regt. Armory, Main Floor	A1	Packard Motor Car Co.....	Colliseum, Main Floor	C4
Cadillac Motor Car Co.....	Colliseum, Main Floor	B4	Palais de l'Automobile.....	First Regt. Armory, Main Floor	F2
Cleveland Motor Car Co.....	Colliseum Annex, Main Floor	Q3	Peerless Motor Car Co.....	Colliseum, Main Floor	D4
Corbin Motor Vehicle Corp.....	Colliseum, Main Floor	D2	Pierce Co., Geo. N.....	Colliseum, Main Floor	B6
Daimler Mfg. Co.....	Colliseum, Main Floor	G1	Pierce Engine Co.....	First Regt. Armory, Main Floor	G3
Dayton Motor Car Co.....	Colliseum, Main Floor	H1	Pope Manufacturing Co.....	Colliseum, Main Floor	G2
Deere-Clark Motor Car Co.....	Col. Annex, 2d Floor	125, 136, 137, 138	Pope Motor Car Co.....	Colliseum, Main Floor	E1
Dolson Automobile Co.....	First Regt. Armory, Main Floor	B2	Premier Motor Mfg. Co.....	Colliseum, Main Floor	C2
Dorris Motor Car Co.....	First Regt. Armory, Main Floor	E8	Rainier Co.....	First Regt. Armory, Main Floor	C2
DeLuxe Motor Car Co.....	Col. Annex, 2d Floor	127, 128, 129, 134, 135, 136	Rapid Motor Vehicle Co.....	First Regt. Armory, Main Floor	C4
Dragon Automobile Co.....	First Regt. Armory, Main Floor	F1	Reo Motor Car Co.....	Colliseum Annex, Main Floor	M1
Duryea Power Co.....	Colliseum, Main Floor	F2	Reliable Dayton Mfg. Co.....	Colliseum Annex, 2d Floor	148, 149
Electric Vehicle Co.....	Colliseum, Main Floor	F3	Royal Motor Car Co.....	Colliseum, Main Floor	E3
Elmore Mfg. Co.....	Colliseum, Main Floor	D5	Simplex Motor Car Co.....	First Regt. Armory, Main Floor	D7
Evansville Auto Co.....	First Regt. Armory, Main Floor	E2	Smith & Mabley Mfg. Co.....	First Regt. Armory, Main Floor	C3
Forest City Motor Car Co.....	Colliseum Annex,	P1	Smith & Mabley, Inc.....	First Regt. Armory, Main Floor	C3
Franklin Mfg. Co., H. H.....	Colliseum, Main Floor	B1	Star Auto Co.....	First Regt. Armory, Main Floor	G9
Grout Bros. Automobile Co.....	Colliseum Annex, Main Floor	O2	Stearns Co., F. B.....	Colliseum, Main Floor	D6
Harrison Wagon Works.....	Colliseum Annex,	Q4	Soules Motor Car Co.....	First Regt. Armory, Main Floor	G6
Haynes Automobile Co.....	Colliseum, Main Floor	D3	Stevens-Duryea Co.....	Colliseum, Main Floor	A4
Holsman Automobile Co.....	Colliseum Annex, Main Floor	L1	Studebaker Automobile Co.....	Colliseum, Main Floor	A1
Jackson Automobile Co.....	First Regt. Armory, Main Floor	B3	St. Louis Motor Car Co.....	Colliseum, Main Floor	F6
Jeffery, Thos. B., & Co.....	Colliseum, Main Floor	E2	Thomas Motor Co., E. R.....	Colliseum, Main Floor	C6
Kissell Motor Car Co.....	First Regt. Armory, Main Floor	E6	Triumph Motor Car Co.....	Colliseum Annex, 2d Floor	142
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Knox Automobile Co.....	Colliseum, Main Floor	F5	Waltham Mfg. Co.....	Colliseum, Main Floor	A5
Knight & Kilbourne.....	First Regt. Armory, Main Floor	B1	Wayne Automobile Co.....	Colliseum, Main Floor	A2
Lear Automobile Co., Oscar.....	First Regt. Armory, Main Floor	C1	Wayne Works.....	First Regt. Armory, Main Floor	G2
Locomobile Co. of America.....	Colliseum, Main Floor	C1	Welch Motor Car Co.....	Colliseum Annex, Main Floor	N1
Logan Construction Co.....	First Regt. Armory, Main Floor	E7	Western Tool Works.....	First Regt. Armory, Main Floor	E1
Lozler Motor Co.....	Colliseum Annex, Main Floor	J1	White Sewing Machine Co.....	Colliseum, Main Floor	F7
Matheson Motor Car Co.....	Colliseum, Main Floor	C5	Winton Motor Carriage Co.....	Colliseum, Main Floor	A3
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Baker Motor Vehicle Co.....	Colliseum, Main Floor	A6	Rauch & Lang Carriage Co.....	First Regt. Armory, Main Floor	A2
Columbus Buggy Co.....	Colliseum Annex, Main Floor	Q2	Studebaker Automobile Co.....	Colliseum, Main Floor	A1
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G & J Tire Co.....	Colliseum, Gallery	59, 60
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Avery Portable Lighting Co.....	Colliseum Annex, 2d Floor	114
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 Detroit Lubricator Co.....Colliseum Annex, 2d Floor 98
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 Imperial Brass Mfg. Co.....Colliseum Annex, 2d Floor 110
 McCord & Co.....Colliseum, Gallery 34
 Moline Pump Co.....Colliseum Annex, 2d Floor 151
 National Oil Pump & Tank Co.....First Regt. Armory, Gallery 11
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 Midgley Mfg. Co.....Colliseum, Gallery 35
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Diezemann Shock Absorber Co.....Colliseum, Gallery 1
 Hartford Suspension Co.....Colliseum, Gallery 74
 Kligore Air Cushion Co.....Colliseum Annex, 2d Floor 113
 Sager, J. H.....Colliseum Annex, 2d Floor 96

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 Oliver Instrument Co.....Colliseum Annex, 2d Floor 117
 Post & Lester.....First Regt. Armory, Gallery 22
 Smith Mfg. Co., R. H.....Colliseum Annex, 2d Floor 85
 Veeder Mfg. Co.....Colliseum, Gallery 42
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 Fowler-Manson-Sherman Cycle Mfg. Co.....Col. Annex, 2d Floor 147
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 Hendee Mfg. Co.....Colliseum Annex, 2d Floor 122, 141
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 Tilt, C. A.....Colliseum Annex, 2d Floor 144
 Valentine & Co., Varnishes.....Colliseum, Gallery 11

THE AMERICAN AUTOMOBILE

D OUBTLESS there are few, even though closely connected with the industry—in fact, a part of it—and cognizant on that account of all that happens concerning it, who appreciate the vast strides it has been making, or realize on what a solid foundation this growth is based. There is presented, in tabular form in the following pages, for the first time in the history of the industry, a résumé of the cars, the annual output of which, mounting into the thousands, goes to swell the vast total that has served to place America in the front rank, where the number of cars in use is concerned, despite the fact that she was among the last of the principal manufacturing nations of the globe to consider the automobile seriously, and when she did take it up, persistently barked up the wrong tree for some time. An attempt has been made to present in tabular form for easy reference, a list of all the cars made in this country, grading them according to their selling price alone, so that, taken as a whole, the table may be said to be representative of the American automobile. It is not contended that the list is as complete as it can possibly be made; doubtless, there may be some makers who have been in business for some time who have been inadvertently overlooked, while in other cases, cars that are listed have ceased to be factors, except in the hands of those few purchasers.

An analysis of its most salient features shows better than

anything else can the trend of things in the automobile field, as well as revealing in a manner little short of marvelous the great expansion it has undergone in the past year or two. The first page of the table brings to light in no uncertain manner the fact that while the "poor man's automobile" may not be a reality as yet, it is not because there is no one bending an effort toward that goal. The extent of the list of cars of all types that are now made to sell at less than \$1,000 must come as a surprise to those who have always regarded the automobile solely as the perquisite of great wealth. And this must be further intensified by the even greater showing of cars made to sell between \$1,000 and \$2,000, while going a little further reveals the fact that probably more automobiles of the modern, high-powered type are listed at \$2,500 than at any other single figure. More than this, it shows that the efforts of American manufacturers are not confined to catering to any one class where style or power is concerned; cars are being turned out in large quantities at low figures, but, on the other hand, the American maker has also soared, and automobiles made in this country are now to be had at prices as high as any demanded abroad. In the field of the electric pleasure vehicle, and of the commercial vehicle, both of the electric and gasoline-driven types, the great expansion that is constantly taking place is equally plain.

PRINCIPAL DETAILS OF AMERICAN CARS FOR 1907

CAR	Price	Power	No. Cyls.	Seats	Clutch	Change Speed Gear	Drive	Wheel Base	Weight	Tires
Success.....	\$250	3	1	2	Planetary.....	.....	Chain.....	.....	.....	41 & 44 x 1 1/2
Paragon.....	375	5	2	2	.....	Planetary..	Shaft....	58"	550	28 x 2 1/2
Jewell.....	400	8	1	2	.....	Planetary..	Chain....	60"	700	32 x 2
Dorchester.....	400	4	1	2	.....	.....	Chain....	.....	400	28 x 2
Orient.....	400	4	1	2	Friction.....	.....	Chain....	80"	750	26 x 2 1/2
Palmer.....	400	9	1	2	Cable.....	.....	.....	.....	.....	36 x 2
Postal.....	450	12	2	2	.....	.....	.....	72"	.....	.....
Orient.....	475	4	1	2	Friction.....	.....	Chain....	73"	650	26 x 2 1/2
Federal.....	475	12	2	2	Friction.....	.....	Chain....	.....	650	36 x 1 1/2
Brush.....	500	6	1	2	.....	Planetary..	Rope....	.....	800	42 & 44 x 1 1/2
Reliable—Dayton.....	500	12	2	2	.....	Planetary..	D. Chain	.....	700	40 & 44 x 1 1/2
Orient.....	525	4	1	4	Friction.....	.....	Chain....	77"	750	26 x 2 1/2
Okey.....	550	7	2	2	.....	Planetary..	Shaft....	76"	1,300	30 x 3 1/2
Ford.....	600	15	4	2	.....	Planetary..	Shaft....	84"	1,000	30 x 3
Gale.....	600	10	2	2	.....	Planetary..	Chain....	73"	1,150	28 x 3
Walker.....	600	10	2	2	.....	Planetary..	Shaft....	78"	.....	28 x 3
Farmer's.....	600	10	2	4	.....	Planetary..	Chain....	90"	.....	44 x 1 1/2
Monarch.....	600	14	2	2	.....	Planetary..	Shaft....	78"	1,000	28 x 3
Oldsmobile.....	650	7	1	2	.....	Planetary..	Chain....	72"	1,000	28 x 3
Holsman.....	650	10	2	4	.....	.....	Rope....	75"	850	44 & 48 x 1 1/2
Beebe.....	650	12	2	2	.....	Planetary..	Chain....	80"	.....	36 x 1 1/2
Reo.....	675	8	1	4	.....	Planetary..	Chain....	.....	.....	28 x 3
Holsman.....	700	10	2	2	.....	.....	Rope....	75"	850	44 & 48 x 1 1/2
Page.....	750	14	2	2	.....	.....	Shaft....	84"	.....	28 x 3
Cadillac.....	800	10	1	2	.....	Planetary..	Chain....	.....	.....	30 x 3
Holsman.....	800	10	2	4	.....	.....	Rope....	.....	900	44 & 48 x 1 1/2
Crown.....	800	12	2	2	.....	Planetary..	Shaft....	76"	1,000	28 x 3
Marvel.....	800	14	2	2	Cone.....	Planetary..	Shaft....	84"	1,300	30 x 3
Maxwell.....	825	14	2	2	.....	Planetary..	Shaft....	72"	1,150	.....

PRINCIPAL DETAILS OF AMERICAN CARS—Continued

CAR	Price	Power	No. Cyls.	Seats	Clutch	Change Speed Gear	Drive	Wheel Base	Weight	Tires
Stanley.....	850	10	Ste'm	2			Gear....	90"	1,100	30 x 3
Cadillac.....	950	10	1	4		Planetary..	Chain....	76"		30 x 3½
Rambler.....	950	14	2	2		Planetary..	Chain....	90"	1,500	30 x 3½
Hewitt.....	1,000	10	1	4	Planetary..		Chain....	72"	1,200	30 x 3½
Leader.....	1,000	18	2	5	Planetary..		Chain....	84"	1,675	30 x 3½
Logan.....	1,000	10	2	2	Con. Band.		Chain....	86"	1,600	32 x 3½
Buick.....	1,150	22	2	2	Cone.....	Planetary..		89"	1,750	30 x 3½
Autocar.....	1,200	14	2	3	Disc.....	Sliding...	Shaft....	81"	1,500	30 x 3
Cameron.....	1,200		4	4	Cone.....	Sliding...	Shaft....	96"		30 x 3½
La Salle Niagara.....	1,250	18	2	4		Planetary..	Shaft....	90"	1,600	30 x 3½
Auburn.....	1,250	24	2	4		Planetary..	Chain....	100"		32 x 3½
Model.....	1,250	24	2	4	Cone.....	P'n or Sl'	Chain....	100"	1,600	34 x 3½
Waltham.....	1,250	16	4	2	Cone.....	Sliding...	Shaft....	82"	1,800	30 x 3½
Jackson.....	1,250	24	2	4	Cone.....	Planetary..	Chain....	90"	1,750	30 x 3½
Reliance.....	1,250	22	2	5	Cone.....	Sliding...	Shaft....			
Chalfant.....	1,250	22	2	5		Planetary..	Chain....	90"		30 x 3½
Duryea.....	1,250	15	3	4		Planetary..	Chain....	75"	1,050	30 x 3 & 36 x 3
Moline.....	1,250	18	2	5		Planetary..	Chain....	92"		30 x 3½
Beebe.....	1,250	20	2	5		Sliding...	D. Chain	100"		30 x 3½
Reo.....	1,250	20	2	4		Planetary..	Chain....	94"	1,850	30 x 3½
Rambler.....	1,250	22	2	2		Planetary..	Chain....	100"	2,000	30 x 4
Gale.....	1,325	20	2	5		Planetary..	Chain....	92"	1,750	30 x 3½
Cartercar.....	1,350	20	2	4	Friction...			94"	1,600	32 x 3 & 3½
Rambler.....	1,350	22	2	5		Planetary..	Chain....	100"	2,000	30 x 4
Maxwell.....	1,375	20	2	2		Planetary..	Shaft....		1,600	
Eagle.....	1,400	24	4	5		Planetary..		110"	1,400	
Torbensen.....	1,400	18	2	4		Planetary..	Chain....	86"		
Compound.....	1,400	16	3	5	Cone.....	Sliding...	Shaft....	84"	1,400	28 x 3½
Maxwell.....	1,450	20	2	4		Planetary..	Shaft....	86"	1,700	30 x 3½
Oxford.....	1,500	19	2	5	Friction...	Select.....	Shaft....	90"	1,800	
Stanley.....	1,500	20	Ste'm	5			Gear....	100"	1,700	34 x 3½
Merkel.....	1,500	16	4	2	Cone.....	Sliding...	Shaft....	86"	1,450	32 x 3
Jackson.....	1,500	24	2	4	Disc.....	Planetary..	Shaft....	100"	1,900	32 x 3½
Logan.....	1,500	20	2	5	Expanding.		Shaft....	86"	1,600	32 x 3½
Duryea.....	1,500	18	3	5		Planetary..	Chain....	80"	1,200	36 x 3½
Detroit.....	1,500	22	2	5	Cone.....	Select.....	Shaft....	96"	1,800	32 x 3½
Trebert.....	1,600	30	4	5	Disc.....	Sliding...	Shaft....	103"	2,800	34 x 4
Compound.....	1,600	16	3	5	Cone.....	Sliding...	Shaft....	96"	1,650	28 x 3½
Mitchell.....	1,600	20	4	5	Cone.....	Sliding...	Shaft....	90"	1,600	
Mora.....	1,650	24	4	4	Cone.....	Sliding...	Shaft....	98"	1,700	32 x 3½
Northern.....	1,700	20	2	5		Planetary..	Shaft....	106"	2,100	32 x 3½
Stoddard-Dayton.....	1,750	18	4	2	Cone.....	Sliding...	Shaft....	88"	1,400	30 x 3½
Waltham.....	1,750	20	4	5	Cone.....	Sliding...	Shaft....	96"	1,800	32 x 3½
Elmore.....	1,750	24	3	5		Sliding...	Shaft....	102"	1,750	30 x 3½
Pope-Tribune.....	1,750	20	4	2	Cone.....	Sliding...	Shaft....	95"	1,600	32 x 3½
Kansas City.....		25	2	4		Planetary..	Chain....			30 x 3½
Mitchell.....	1,800	24	4	5	Cone.....	Sliding...	Shaft....	100"	2,200	32 x 4
Dolson.....	1,800		4	5	Disc.....	Sliding...	Shaft....	108"		
Pullman—Runabout.....	1,800	20	4	2	Cone.....	Sliding...	Shaft....	92"	1,755	30 x 3½
Compound.....	1,800	20	3	5	Cone.....	Sliding...	Shaft....	92"	1,600	
Klink.....	1,850	35	4	5		Select.....	Shaft....	108"		
Riviera.....	1,850	20	2	5		Planetary..	Shaft....	106"		32 x 4
Kisselkar.....	1,850	30	4	5	Cone.....	Sliding...	Shaft....	98"		32 x 4
Franklin.....	1,850	12	4	4	Disc.....	Sliding...	Shaft....	90"	1,450	30 x 3 & 3½
Pullman.....	1,900	20	4	5	Cone.....	Sliding...	Shaft....	92"	1,755	30 x 3½
Adams-Farwell.....	2,000		3	2		Planetary..	Chain....			
Mitchell.....	2,000	35	4	5	Cone.....	Sliding...	Shaft....	108"	2,300	32 x 4
Moline.....	2,000	24	4	5	Cone.....	Sliding...	Shaft....	100"	2,050	32 x 3½
Marion.....	2,000	22	4	5	Cone.....	Sliding...	Shaft....	100"	1,825	32 x 3½
Pungs-Finch.....	2,000	30	4	5	Disc.....	Sliding...	Shaft....	110"	1,600	32 x 3½
Mora.....	2,000	24	4	5	Cone.....	Sliding...	Shaft....	103"	1,900	32 x 14
Crawford.....	2,000		4		Disc.....		D. Chain	106"		

PRINCIPAL DETAILS OF AMERICAN CARS—Continued

CAR	Price	Power	No. Cyls.	Seats	Clutch	Change Speed Gear	Drive	Wheel Base	Weight	Tires
Dragon.....	2,000	26	4	.....	Cone.....	Sliding..	Shaft....	104"	1,800	32 x 3½
Lambert.....	2,000	40	4	5	Friction.....	.....	Shaft....	105"	1,900	32 x 3½
Buick.....	2,000	30	2	5	Disc.....	Plane'ry	Shaft....	106½"	1,800	32 x 4
Dolson.....	2,000	32	4	5	Disc.....	Sliding..	Shaft....	108"	.....	.....
Waltham.....	2,100	20	4	5	Cone.....	Sliding..	Shaft....	96"	1,850	32 x 3½
Glide.....	2,100	36	4	5	Disc.....	Sliding..	Shaft....	103"	2,250	32 x 4
La Salle Niagara.....	2,250	30	4	5	.....	Sliding..	Shaft....	100"	1,800	32 x 3½
Iroquois.....	2,250	30	4	5	Expansion.....	Sliding..	Shaft....	96"	.....	30 x 3½
Premier.....	2,250	24	4	5	Disc.....	Sliding..	Shaft....	110"	2,100	.....
Queen.....	2,250	28	4	5	Disc.....	Select..	Shaft....	100"	2,000	32 x 4
Crown.....	2,250	24	4	5	.....	Plane'ry	Shaft....	99"	2,000	32 x 3½
Riviera.....	2,250	28	4	5	Cone.....	Sliding..	Shaft....	106"	.....	32 x 4
Compound.....	2,250	20	3	5	.....	.....	.....	102"	1,750	.....
Dorris—Runabout.....	2,350	30	4	2	Disc.....	Select..	Shaft....	102"	2,200	32 x 4
White.....	2,400	20	Ste'm	2	.....	.....	Shaft....	102"	.....	34 x 4
Chicago.....	2,500	25	Ste'm	5	.....	.....	Shaft....	114"	2,400	34 x 4
Corbin.....	2,500	24	4	5	Cone.....	Select..	Shaft....	108"	2,200	34 x 3½ & 4
White.....	2,500	20	Ste'm	5	.....	.....	Shaft....	104"	.....	34 x 4
Cadillac.....	2,500	30	4	5	Disc.....	Plane'ry	Shaft....	102"	.....	32 x 4
Stevens-Duryea.....	2,500	20	4	5	Disc.....	Sliding..	Shaft....	90"	1,850	30 x 3½
Winton.....	2,500	30	4	5	Ind. Clutch.....	.....	Shaft....	104"	2,200	34 x 4
Kansas City.....	.....	30	4	5	.....	Sliding..	Shaft....	90"	.....	32 x 4
Haynes.....	2,500	30	4	5	Con. Band.....	Select..	Shaft....	102"	2,250	32 x 4
Jackson.....	2,500	45	4	5	Disc.....	Sliding..	Shaft....	108"	2,400	34 x 4
Knox.....	2,500	30	4	5	Cone.....	Select..	Shaft....	102"	2,250	32 x 4
Chadwick.....	.....	30	4	5	Cone.....	Sliding..	D. Chain	108½"	2,500	34 x 4½
Grout.....	2,500	35	4	5	Cone.....	Sliding..	Chain.....	108"	2,600	32 x 4
Dorris.....	2,500	30	4	5	Disc.....	Select..	Shaft....	102"	2,300	32 x 4
Smith.....	2,500	24	4	5	Disc.....	Sliding..	Shaft....	107"	2,100	34 x 4
Moline.....	2,500	35	4	5	Cone.....	Sliding..	Shaft....	110"	.....	34 x 4
Hammer.....	2,500	24	4	5	.....	Plane'ry	Shaft....	98"	1,750	32 x 4
Lambert.....	2,500	40	4	5	Friction.....	.....	D. Chain	106"	2,500	32 x 4
Pungs-Finch.....	2,500	35	4	5	Disc.....	Sliding..	Shaft....	.....	.....	32 x 3½
Logan.....	2,500	30	4	5	.....	Sliding..	Shaft....	108"	3,750	32 x 4
Marmon.....	2,500	24	4	5	D. Cone.....	Plane'ry	Shaft....	96"	2,150	32 x 4
St. Louis.....	2,500	35	4	5	Disc.....	Sliding..	Shaft....	108"	2,400	32 x 4
Wayne.....	2,500	35	4	5	Expansion.....	Sliding..	Shaft....	106"	2,400	34 x 3½ & 4
Dolson.....	2,500	40	4	5	Disc.....	Sliding..	Shaft....	111"	2,400	34 x 4
Lane.....	2,500	20	Ste'm	5	.....	.....	Shaft....	97"	2,300	32 x 4
Glide.....	2,500	36	4	5	Disc.....	Sliding..	Shaft....	120"	2,500	34 x 4
Stoddard-Dayton.....	2,500	35	4	5	Cone.....	Select..	Shaft....	105"	2,500	34 x 4
Iroquois.....	2,500	40	4	5	Expansion.....	Sliding..	Shaft....	100"	.....	34 x 4
Johnson.....	2,500	30	Ste'm	5	Jaw.....	.....	Shaft....	112"	2,800	34 x 4
Rambler.....	2,500	35	4	5	Cone.....	Sliding..	D. Chain	112"	2,900	34 x 4
Adams-Farwell.....	2,500	.....	3	4	.....	Plane'ry	Chain.....	.....	.....	.....
Deere.....	2,500	30	4	5	Disc.....	Sliding..	Shaft....	110"	2,500	34 x 3½ & 4
Hewitt—Town Car.....	2,600	10	1	5	Disc.....	Plane'ry.	Chain....	84"	1,800	{ 760 x 90 765 x 105
Pierce-Racine.....	2,600	40	4	5	Cone.....	Shaft....	Shaft....	106"	.....	34 x 4½
Atlas.....	2,600	30	2	5	Cone.....	Sliding..	Shaft....	102"	.....	.....
Thomas "Forty".....	2,750	40	4	5	Cone.....	Select..	Shaft....	112"	2,500	32 x 4
Pope-Hartford.....	2,750	30	4	5	Cone.....	Sliding..	Shaft....	102"	2,400	32 x 4
Oldsmobile.....	2,750	40	4	5	Cone.....	Select..	Shaft....	106½"	2,500	34 x 3½ & 4
Aerocar.....	2,750	40	4	5	Disc.....	Sliding..	Shaft....	.....	2,700	.....
Franklin.....	2,800	20	4	5	Disc.....	Sliding..	Shaft....	105"	1,900	34 x 3 & 3½
Locomobile.....	2,800	20	4	5	Cone.....	Sliding..	Chain.....	96"	1,900	32 x 4
Pennsylvania.....	2,800	35	4	5	Cone.....	Sliding..	Shaft....	111"	2,550	34 x 4
Ross.....	2,800	25	Ste'm	5	.....	.....	Shaft....	108"	2,600	34 x 4
Ford.....	2,800	40	6	5	.....	Plane'ry	Shaft....	120"	2,600	34 x 4
Triumph.....	2,800	30	4	5	Disc.....	Sliding..	Shaft....	108"	2,200	36 x 3½ & 4
Adams-Farwell.....	3,000	.....	5	.....	D. Sliding.....	.....	Gear.....	.....	.....	.....
Autocar.....	3,000	30	4	5	Disc.....	Sliding..	Shaft....	112"	2,500	32 x 4
Columbia.....	3,000	28	4	5	Cone.....	Sliding..	Shaft....	109"	2,350	32 x 3½ & 4
Lambert.....	3,000	40	4	5	Friction.....	.....	D. Chain	106"	2,700	32 x 4
St. Louis.....	3,000	50	4	5	Disc.....	Sliding..	Shaft....	116"	2,600	34 x 4½
Maxwell.....	3,000	40	4	7	Disc.....	Sliding..	Shaft....	104"	2,500	34 x 4
Conover.....	3,000	40	4	5	Cone.....	Select..	Shaft....	104"	2,400	34 x 4
Iroquois.....	3,000	40	4	7	Cone.....	Sliding..	Shaft....	100"	2,450	32 x 4½
Upton.....	3,000	40	4	5	Disc.....	Select..	Shaft....	109"	.....	34 x 4½
Pullman.....	3,000	40	4	5	Cone.....	Select..	Shaft....	110"	.....	34 x 4 & 4½
Halliday.....	3,000	40	4	7	Cone.....	Sliding..	Shaft....	110"	.....	.....

PRINCIPAL DETAILS OF AMERICAN CARS—Continued

CAR	Price	Power	No. Cyls.	Seats	Clutch	Change Speed Gear	Drive	Wheel Base	Weight	Tires
Simplicity.....	3,000	40	4	5	Friction.....	.....	D. Chain	105"	.....	34 x 4
National.....	3,000	40	4	5	Cone.....	Sliding..	Shaft....	104"	.....	32 x 4
Studebaker.....	3,200	32	4	5	.....	Sliding..	Shaft....	104"	.....	34 x 4
Dolson.....	3,250	60	4	7	Disc.....	Sliding..	Shaft....	123"	3,000	31 x 4½
American—Roadster.....	3,250	40	4	5	Cone.....	Sliding..	Shaft....	106"	2,300	36 x 3½ & 4
White.....	3,400	30	Ste'm	2	.....	.....	Shaft....	115"	.....	36 x 4 & 5
Lane.....	3,400	30	Ste'm	5	.....	.....	Shaft....	112"	2,700	36 x 4
Haynes.....	3,500	50	4	7	Con. Band.....	Select..	Shaft....	110"	2,950	34 x 4½
White.....	3,500	30	Ste'm	5	.....	.....	Shaft....	115"	.....	36 x 4 & 5
Winton.....	3,500	40	4	7	Disc.....	Select..	Shaft....	112"	.....	34 x 4½
Northern.....	3,500	50	4	7	Com. Air.....	Sliding..	Shaft....	119"	3,300	34 x 4½
Berkshire.....	3,500	35	4	5	Ind. Clutch.....	.....	Shaft....	118"	2,800	36 x 3½ & 4½
Marmon.....	3,500	35	4	5	Disc.....	Sliding..	Shaft....	104"	2,850	34 x 4 & 4½
Cleveland.....	3,500	35	4	5	Cone.....	Sliding..	Shaft....	104"	2,300	34 x 4
Wayne.....	3,500	50	4	7	Cone.....	Sliding..	Shaft....	117"	2,800	34 x 4½
Merkel.....	3,500	40	4	5	Cone.....	Sliding..	Shaft....	110"	2,800	34 x 4
National.....	3,500	50	4	5	Cone.....	Sliding..	Shaft....	112"	2,650	34 x 4½
B-L-M.....	3,500	24	4	5	Cone.....	Sliding..	Shaft....	98"	1,300	32 x 3½
Glide.....	3,500	50	4	5	Disc.....	Sliding..	Shaft....	132"	3,000	36 x 4½
Sovereign.....	.....	40	4	8	.....	Select..	D. Chain	120"	.....	36 x 4 & 5
Moon.....	3,500	35	4	5	Disc.....	Sliding..	Shaft....	110"	2,600	34 x 3½ & 4½
Silent Knight.....	3,500	40	4	5	.....	Sliding..	Shaft....	112"	2,600	34 x 4
Frontenac.....	3,500	40	4	5	.....	Sliding..	Shaft....	112"	2,600	34 x 4½
Gaeth.....	3,500	50	4	7	Band.....	Sliding..	Shaft....	112"	3,000	34 x 4 & 4½
Sturtevant.....	3,500	35	4	2	Automatic.....	.....	Shaft....	98"	1,800	32 x 3½
Stevens-Duryea.....	3,500	35	6	5	Disc.....	Sliding..	Shaft....	114"	2,300	34 x 4
Model.....	3,600	50	4	7	.....	Sliding..	Shaft....	.....	.....	.....
White.....	3,700	30	Ste'm	7	.....	.....	Shaft....	115"	.....	34 x 4 & 5
Compound.....	3,750	40	6	5	Cone.....	Sliding..	Shaft....	115"	2,500	.....
Studebaker.....	4,000	35	4	5	Cone.....	Sliding..	Shaft....	104"	2,500	34 x 4 & 4½
Thomas.....	4,000	60	4	7	Disc.....	Select..	D. Chain	118"	3,200	36 x 4 & 5
Peerless.....	4,000	30	4	5	Int'l Exp'd'g.....	Select..	Shaft....	109"	2,800	34 x 4 & 4½
Frayser-Miller—Runabout.....	4,000	36	6	2	Int'l Exp'd'g.....	Sliding..	Shaft....	122"	2,500	36 x 4½
Franklin.....	4,000	30	6	7	Disc.....	Sliding..	Shaft....	127"	2,400	36 x 3½ & 4
Cleveland—Limousine.....	4,000	35	4	7	Cone.....	Sliding..	Shaft....	104"	2,800	34 x 4
Adams-Farwell.....	4,000	45	5	5	D. Sliding.....	.....	Gear.....	108"	2,400	34 x 4½
Royal-Touring.....	4,000	45	4	7	Cone.....	Sliding..	Shaft....	114"	.....	34 x 4½
Studebaker.....	4,000	30	4	7	Cone.....	Sliding..	Shaft....	104"	.....	34 x 4
Acme.....	4,000	50	4	7	.....	.....	.....	115½"	2,600	34 x 4
Knox.....	4,000	40	4	7	Cone.....	Select..	D. Chain	112"	2,800	34 x 4½
Woods.....	4,000	40	4	5	.....	.....	.....	120"	3,000	36 x 4½
Craig-Toledo.....	4,000	40	4	7	Disc.....	Sliding..	Shaft....	112"	2,550	36 x 3½ & 4
Pierce Great Arrow.....	4,000	30	4	5	.....	Sliding..	Shaft....	112"	2,900	34 x 4 & 4½
Frayser-Miller.....	4,000	50	4	7	Expansion.....	Sliding..	Shaft....	122"	2,750	36 x 4½
Cleveland.....	4,000	35	4	7	Cone.....	Sliding..	Shaft....	124"	2,140	34 x 4 & 4½
Welch.....	4,200	50	4	7	Ind. Clutch.....	.....	Shaft....	129"	3,000	36 x 5
Apperson.....	4,200	45	4	7	Com. Band.....	Select..	D. Chain	116"	2,900	34 x 4 & 4½
Packard.....	4,200	30	4	5	Cone.....	Sliding..	Shaft....	112"	2,900	34 x 3½ & 4
Rainier.....	4,250	35	4	5	Cone.....	Sliding..	Shaft....	104"	4,250	34 x 4
Matheson.....	4,250	35	4	3	Disc.....	Select..	D. Chain	117"	3,200	36 x 4 & 4½
Pope-Toledo.....	4,250	50	4	7	Disc.....	Select..	D. Chain	115"	2,900	36 x 3½ & 4½
White—Limousine.....	4,500	30	Ste'm	7	.....	.....	Shaft....	115"	.....	34 x 4 & 5
Matheson.....	4,500	35	4	7	Disc.....	Select..	D. Chain	117"	3,400	36 x 4 & 4½
Thomas.....	4,500	60	4	7	Disc.....	Select..	D. Chain	118"	3,500	36 x 4 & 5
Columbia.....	4,500	45	4	7	Cone.....	Select..	D. Chain	117"	3,400	36 x 4 & 4½
Stearns.....	4,500	60	4	5	Int'l Exp'd'g.....	Select..	D. Chain	120"	3,200	36 x 4 & 4½
Austin.....	4,500	60	4	8	Disc.....	Select..	D. Chain	116"	3,300	36 x 4 & 5
Simplicity—Limousine.....	4,500	40	4	7	.....	Friction.	D. Chain	105"	2,500	34 x 4
White—Pullman-Limousine.....	4,700	30	Ste'm	7	.....	.....	Shaft....	115"	.....	34 x 4 & 5
Apperson.....	4,750	55	4	7	Com. Band.....	Select..	D. Chain	116"	3,000	36 x 4 & 4½
De Luxe.....	4,750	60	4	7	Cone.....	Sliding..	Shaft....	121"	3,000	36 x 3½ & 4½
Stearns—Pullman.....	4,750	60	4	7	Int'l Exp'd'g.....	Select..	D. Chain	120"	3,200	36 x 4 & 4½
Studebaker—Limousine.....	5,000	35	4	7	Cone.....	Sliding..	Shaft....	104"	.....	34 x 4
Locomobile.....	5,000	35	4	5	Cone.....	Sliding..	D. Chain	106"	2,900	34 x 4½
Matheson—Runabout.....	5,000	50	4	3	Disc.....	Select..	D. Chain	123"	3,250	36 x 4 & 5
Thomas—Limousine.....	5,000	60	4	7	Disc.....	Select..	D. Chain	118"	3,800	36 x 4 & 5
Pierce Great Arrow.....	5,000	45	4	7	.....	Sliding..	Shaft....	124"	3,400	36 x 4 & 5
Studebaker—Landaulet.....	5,000	35	4	7	Cone.....	Sliding..	Shaft....	104"	.....	34 x 4 & 4½

PRINCIPAL DETAILS OF AMERICAN CARS—Continued

CAR	Price	Power	No. Cyls.	Seats	Clutch	Change Speed Gear	Drive	Wheel Base	Weight	Tires
Royal-Tourist Limousine.....	5,000	45	4	7	Cone.....	Sliding..	Shaft....	114"	.....	34 x 4½
Knox—Limousine.....	5,000	40	4	6	Cone.....	Select... D. Chain	112"	3,200	3,200	34 x 4½
National.....	5,000	75	6	7	Cone.....	Sliding..	Shaft....	127"	3,200	36 x 5
Apperson—Runabout.....	5,000	50	4	3	Com. Band.....	Select... D. Chain	100"	1,800	34 x 3½ & 4	
Chadwick.....	5,000	45	4	7	Cone.....	Sliding..	D. Chain	108"	2,850	34 x 4 & 4½
Lozier.....	5,000	40	4	7	Disc.....	Select... D. Chain	117"	3,050	36 x 4½ & 5	
Lozier—Runabout.....	5,000	40	4	3	Disc.....	Select... D. Chain	115"	2,675	36 x 4½ & 5	
American Mors.....	5,000	32	4	7	Cone.....	Sliding..	D. Chain	106"	.....	34 x 5
Sturtevant.....	5,000	50	4	7	Automatic.....	Shaft....	120"	3,000	34 x 4½	
Harrison.....	5,000	40	4	7	Jaw.....	Sliding..	Shaft....	123"	3,000	36 x 4½
Clark.....	5,000	20	Ste'm	7	Cone.....	Shaft....	108"	2,800	36 x 4½	
Peerless.....	5,000	45	4	7	Int'l Exp'd'g.....	Select... Shaft....	114"	3,300	34 x 4 & 4½	
Moore.....	5,000	40	4	7	.....	Select... Shaft....	.....	.....	.....
Thomas—Landaulet.....	5,200	60	4	7	Disc.....	Select... D. Chain	118"	3,800	36 x 4 & 5	
Matheson.....	5,500	50	4	7	Disc.....	Select... D. Chain	123"	3,400	36 x 4 & 5	
Packard—Limousine.....	5,500	30	4	7	Int'l Exp'd'g.....	Sliding..	Shaft....	122"	3,300	34 x 4 & 4½
Woods—Victoria.....	5,500	45	4	7	Cone.....	Sliding..	D. Chain	120"	3,500	36 x 4½
Walter.....	.....	40	4	7	Disc or Cone.....	D. Slid'g.	Shaft....	124"	3,200	36 x 4 & 5
Walter.....	5,500	50	4	7	Disc or Cone.....	D. Slid'g.	Shaft....	124"	3,600	36 x 4 & 5
Buick.....	5,500	60	8	7	Disc.....	Plane'ry	Shaft....	112"	.....	815 x 105
Simplex.....	5,600	35	4	7	Rev. Cone.....	Sliding..	D. Chain	{ 106" 111" 114"	2,300	{ 910 x 90 920 x 120
Simplex—Runabout.....	5,760	50	4	2	Cone.....	Select... D. Chain	124"	2,250	{ 915 x 105 935 x 135	
Tincher.....	6,000	50	4	7	.....	Sliding..	D. Chain	120"	.....	34 x 4
Lozier—Limousine.....	6,000	40	4	7	Disc.....	Select... D. Chain	117"	3,680	36 x 4 & 4½	
Stevens-Duryea.....	6,000	50	6	7	Disc.....	Sliding..	Shaft....	122"	3,500	36 x 4 & 5
American Mors.....	6,000	52	4	7	Cone.....	Sliding..	Chain...	120"	3,400	36 x 4 & 5
Welch.....	6,000	75	4	7	Disc.....	Ind. Cl'h	Shaft....	138"	3,500	36 x 5
Pierce Great Arrow.....	6,500	65	6	7	Cone.....	Sliding..	Shaft....	135"	3,900	36 x 4½ & 5
Matheson—Land't or Lim'sne.	6,500	50	4	7	Disc.....	Select... D. Chain	123"	3,450	36 x 4 & 5	
American Mercedcs.....	7,500	45	4	7	Disc.....	Select... D. Chain	127"	.....	36 x 4½	
American Napier.....	8,000	60	6	7	Cone.....	Sliding..	Shaft....	126"	4,000	{ 915 x 105 935 x 135
Berliet.....	8,500	40	4	7	Cone.....	Select... D. Chain	126"	.....	36 x 4 &	

DETAILS OF AMERICAN ELECTRIC VEHICLES

CAR	Price	H.P.	Wheelbase	Weight	Tires	Battery	Mileage
Pope-Waverley—Runabout....	\$850	.....	60"	.....	30 x 2½ & 3" Pneumatic.....	24 Cells.....	.....
E. V. Co.—Runabout.....	900	3.5	68"	.....	30 x 3" Pneumatic.....	20 Cells.....	.....
Pope-Waverley—Speed Wagon	950	.....	72"	.....	30 x 2½ & 3" Pnuematic.....	24 Cells.....	.....
National, Model 50.....	950	2.5	67"	1,500	30 x 3" Pneumatic.....	32 Cells.....	.....
National, Model 65.....	1,000	2.5	67"	1,500	30 x 3" Pneumatic.....	32 Cells.....	.....
Woods—Runabout.....	1,000	.....	62"	2,500	.....	20 Cells.....	.....
Pope-Waverley—Speed Wagon	1,025	.....	72"	.....	30 x 2½ & 3" Pneumatic.....	30 Cells.....	.....
Studebaker—Runabout.....	1,135	.....	67"	1,650	30 x 3" Pneumatic.....	24 Cells.....	.....
Pope-Waverley—Physicians'..	1,150	.....	72"	.....	30 x 3" & 3½" Pneumatic.....	30 Cells.....	.....
Baker Imperial.....	1,200	1	68"	1,000	30 x 3" Pneumatic.....	12 Cells.....	.....
National—Runabout.....	1,200	3	70"	1,600	32 x 3½" Pneumatic.....	36 Cells.....	.....
Babcock Special.....	1,250	2.5	72"	1,250	Pneumatic.....	24 Cells.....	100
Studebaker—Stanhope.....	1,275	.....	67"	1,565	Pneumatic.....	24 Cells.....	.....
Pope-Waverley—Stanhope....	1,400	.....	70"	.....	30 x 3½" Pneumatic.....	30 Cells.....	.....
Babcock—Roadster.....	1,400	2.5	78"	1,500	32 x 3½" Pneumatic.....	24 Cells.....	100
E. V. Co.—Victoria-Phaeton..	1,500	.....	.....	.....	Pneumatic.....	24 Cells.....	.....
Columbus—Stanhope.....	1,600	.....	60"	1,600	30 x 3½" Pneumatic.....	24 Cells.....	40-75
Babcock—Victoria.....	1,600	2.5	78"	1,550	32 x 3" Pneumatic.....	24 Cells.....	75-100

DETAILS OF AMERICAN ELECTRIC VEHICLES—Continued

CAR	Price	H. P.	Wheelbase	Weight	Tires	Battery	Mileage
Babcock—Stanhope.....	1,650	2.5	63"	1,900	Solid.....	40 Cells...	50
Studebaker—Special Stanhope.	1,675	.....	74"	2,250	Pneumatic.....	36 Cells.....	.....
Pope-Waverley—Surrey.....	1,700	.....	90"	.....	30 x 4 Pneumatic"	42 Cells.....	.....
E. V. Co.'s Surrey.....	1,700	7	68½"	.....	32 x 3" Pneumatic.....	40 cells.....	.....
Studebaker—Victoria-Phaeton.	1,775	.....	68"	2,000	Pneumatic.....	28 Cells.....	.....
Rauch & Lang—Stanhope.....	1,800	2.	67"	1,600	32 x 3½" Pneumatic.....	24 Cells...	75
Baker—Runabout.....	1,800	2	76"	1,500	30 x 3" Pneumatic.....	24 Cells...	80
Lansden—Electrette.....	1,850	.....	90"	1,850	30 x 3½" Pneumatic.....	60 Cells...	60
Woods Victoria.....	1,900	.....	73"	2,600	.....	40 Cells.....	.....
Columbus—Coupe.....	1,900	.....	69	1,600	30 x 3½" Pneumatic.....	24 Cells...	40-75
Rauch & Lang—Coupe.....	2,000	2	68"	1,750	32 x 3½" Pneumatic.....	24 Cells...	75
Babcock, Model 3.....	2,000	2.5	.....	2,200	.....	40 Cells.....	.....
Baker—Suburban.....	2,000	2.5	70"	1,750	34 x 3½" & 4" Pneumatic.....	24 Cells.....	.....
E. V. Co.—Opera Bus.....	2,000	4	69"	5,330	36" & 42 x 3½" Solid.....	44 Cells.....	.....
Babcock Model No. 4.....	2,250	.....	72"	2,500	.....	48 cells...	75
Pope-Waverley—Stat'n Wagon	2,250	.....	77½"	.....	30 x 4 Pneumatic.....	41 Cells.....	.....
Woods Victoria.....	2,400	.....	74"	3,000	.....	40 Cells.....	.....
Woods—Detachable Brougham	2,500	.....	73"	2,600	.....	40 Cells.....	.....
Columbus Surrey.....	2,500	.....	89	2,200	34 x 4 Pneumatic.....	24 Cells...	60
Baker—Surrey.....	2,650	2.5	86½"	2,100	36 x 3½" & 4½" Pneumatic.....	24 Cells.....	.....
Woods—Theatre Bus.....	2,800	.....	70"	3,200	.....	40 Cells.....	.....
Woods—R'nd-Front Brougham	2,800	.....	86"	3,200	.....	40 Cells.....	.....
Studebaker—Surrey.....	2,985	.....	.....	.....	.....	28 Cells.....	.....
Columbus—Surrey.....	3,000	.....	89"	2,400	34 x 4½" Pneumatic.....	24 Cells...	50
Rauch & Lang—Depot Wagon.	3,000	.....	87"	2,500	36 x 4½" Pneumatic.....	24 Cells.....	.....
Woods—Landaulet.....	3,000	.....	83	3,400	.....	40 Cells.....	.....
Woods—Extension Landaulet..	3,500	.....	96"	3,650	.....	40 Cells.....	.....
Cantono—Fore Brougham, Ex-	3,500	.....	90"	3,000	2½" Solid.....	.....	.....
tension Straight Front.....	3,500	5	.....	.....	.....	.....	.....
Baker—Inside-Driven B'gham.	3,500	2.5	86½"	2,200	36 x 3½" & 4½" Pneumatic.....	24 Cells.....	.....
E. V. Co.—Victoria.....	4,000	.....	.....	.....	Pneumatic.....	44 Cells.....	.....
E. V. Co.—Brougham.....	4,000	.....	.....	.....	Pneumatic.....	44 Cells.....	.....
E. V. Co.—Landaulet.....	4,000	.....	.....	.....	Pneumatic.....	44 Cells.....	.....
E. V. Co.—Hansom.....	4,000	.....	.....	.....	Pneumatic.....	44 Cells.....	.....
Lansden, Type 40 CC.....	4,000	.....	88"	3,500	32 x 4½" Pneumatic.....	60 Cells.....	40

DETAILS OF AMERICAN GASOLINE COMMERCIAL VEHICLES

CAR	H. P.	No. Cylinders	Cooling	Transmission	Drive	Tires	Wheel-base	Type	Carrying Capacity
Orient.....	4	1	Air.....	Friction...	Chain.....	28 x 3.....	89"	Delivery.....	350 lbs.
Winton.....	40	4	Water...	Selective..	Shaft.....	{ 36 x 4" 36 x 7" Twin } Solid	13 ft.	Heavy Truck.	10,000 lbs.
Knox.....	40	4	Air.....	Selective..	Shaft.....				
Knox.....	40	4	Air.....	Selective..	Shaft.....	34 x 4" Solid.....	96"	Aux. Fire Dep't Wagon..	Special Des'n.
Knox.....	40	4	Air.....	Selective..	Shaft.....				
Olds.....	16-18	2	Water...	Planetary..	Chain.....	.....	.....	Truck.....	5,000 lbs.
Franklin.....	12	4	Air.....	Sliding...	Worm.....	30 x 3½" Solid.....	90"	Light Truck..	2,000 lbs.
Cadillac.....	10	1	Water...	Planetary..	Chain.....	30 x 3" Pneumatic.....	76"	Delivery.....	1,000 lbs.
Rambler.....	20	2	Water...	Planetary..	Chain.....	32 x 4" Pneumatic.....	100"	Delivery.....	1,000 lbs.
Frayer-Miller.....	24	4	Air.....	Sliding...	Chain.....	34 x 3½—36 x 5".....	100"	Truck.....	5,000 lbs.
Miller.....	45	4	Water...	Sliding...	Chain.....	.....	.....	Sight Seeing..	20 Pass'rs
Miller.....	45	4	Water...	Sliding...	Chain.....	.....	.....	Truck.....	10,000 lbs.
Iroquois.....	60	4	Water...	Sliding...	Chain.....	.....	.....	Truck.....	.....
Iroquois.....	25	4	Water...	Sliding...	Chain.....	.....	.....	Delivery.....	1,000 lbs.
Lambert.....	18	2	Water...	Planetary..	Chain.....	32 x 3½" & 4".....	96"	Light Truck..	3,000 lbs.
Gaeth.....	12	1	Water...	Planetary..	Chain.....	34 x 4" 38 x 4".....	103"	Delivery.....	1,500 lbs.
Premier.....	24	4	.....	.....	Shaft.....	.....	.....	.....	.....
Maxwell.....	20	2	Water...	Sliding...	Shaft.....	30 x 3.....	.....	Delivery.....	.....

DETAILS OF AMERICAN GASOLINE COMMERCIAL VEHICLES—Continued

CAR	H.P.	No. Cylinders	Cooling	Transmission	Drive	Tires	Wheel-base	Type	Carrying Capacity
Maxwell.....	20	2	Water...	Sliding...	Shaft.....			Light Truck..	
Olds.....	20	2	Water...	Planetary..	Chain.....	34 x 4" Solid..		Truck.....	6,000 lbs.
Soules.....	22	2	Water...	Planetary..	Shaft.....			Delivery.....	2,000 lbs.
Manhattan.....		4	Water...		Chain.....			Truck.....	10,000 lbs.
Manhattan.....		4	Water...		Chain.....			Bus.....	12 Pass'grs.
Climax.....	10	1	Water...	Planetary..	Chain.....	30 x 3" Solid..		Delivery.....	1,000 lbs.
Hewitt.....	30	4	Water...	Planetary..	Chain.....	36 x 4" & 8" Solid..		Truck.....	8,000 lbs.
Mitchell.....	14	2	Water...	Sliding...	Worm.....	30 x 3 1/2" Solid..		Light Truck..	2,000 lbs.
Biddle-Murray..	24	4	Water...		Chain.....	36 x 5" Solid..		Truck.....	8,000 lbs.
Knox.....	16	2	Air.....		Chain.....	36 x 4 & 6" Solid..		Truck.....	6,000 lbs.
Logan, Model N.	10	2	Air.....	Sliding...	Chain.....	30 x 3" Solid..		Light Bus... Light Truck..	6 Pas'grs. 1,200 lbs.
Mitchell.....	12	2	Water...	Sliding...	Worm.....	32 x 3" Solid..	100"	Light Truck..	1,500 lbs.
Hewitt.....	10	1	Water...	Planetary..	Chain.....	30 x 2 1/2" & 3" Solid..	84"	Delivery.....	1,000 lbs.
Knox.....	10	1	Air.....	Planetary..	Chain.....	32 x 3 1/2" Solid..	78"	Delivery.....	1,500 lbs.
Northern.....	20	2	Water...	Planetary..	Shaft.....	32 x 3 1/2" Solid..	106"	Truck.....	1,000 lbs.
Cartercar.....	20	2	Water...	Friction...	Chain.....	30 x 3 1/2" Pneumatic..	96"	Delivery.....	1,000 lbs.
Covert.....		2	Water...	Planetary..	Shaft.....			Delivery.....	1,000 lbs.
Maxwell.....	20	2	Water...	Sliding...	Shaft.....	30 x 3 1/2" Pneumatic..	86"	Delivery.....	1,000 lbs.
Reo.....	16	2	Water...	Planetary..	Chain.....	32 x 4" Pneumatic..	90"	Delivery.....	1,500 lbs.
Rapid.....	18	2	Water...	Planetary..	Chain.....	32 x 3 1/2" Solid..	90"	Express.....	3,000 lbs.
Rapid.....	18	2	Water...	Planetary..	Chain.....	32 & 34 x 3 1/2" Solid..	111"	Truck.....	3,000 lbs.
Rapid.....	18	2	Water...	Planetary..	Chain.....	32 x 3" Solid..	116"	Sight Seeing.	20 Pass'grs
Deere.....	22	2	Water...	Sliding...	Chain.....	36 x 4" Solid..		Truck.....	6,000 lbs.
Logan, Model M.	30	2	Water...	Selective...	Chain.....	32 x 4 1/2" Solid..	108"	Truck.....	6,000 lbs.
Atlas.....	30	2	Water...	Selective...	Shaft.....	32 x 3 1/2" & 4" Solid..	102"	Light Truck..	3,000 lbs.
Atlas.....	30	2	Water...	Selective...	Shaft.....	32 x 4" & 4 1/2" Solid..	132"	Sight-Seeing.	18 Pass'grs
Atlas.....	24	2	Water...	Selective...	Shaft.....	32 x 4" & 5" Solid..	96"	Truck.....	4,000 lbs.
Frayser-Miller..	24	4	Air.....	Selective...	Chain.....	34 x 3 1/2" & 5" Solid..	112"	Truck.....	6,000 lbs.
Atlas.....	24	2	Water...	Selective...	Shaft.....	34 x 5" & 6" Solid..	114"	Truck.....	6,000 lbs.
Commerce.....	30	4	Water...	Sliding...	Chain.....	32 x 4"—36 x 5" Solid..	100"	Truck.....	5,000 lbs.
American.....	40	4	Water...	Planetary..	Chain.....	36 x 5" Solid..	118"	Truck.....	6,000 lbs.
American.....	40	4	Water...	Planetary..	Chain.....	36 x 7" Solid..	118"	Brewery.....	10,000 lbs.
Autocar Eq. Co.		4	Water...	Sliding...	Chain.....	36 x 3 1/2" & 4" Solid..	95"	Truck.....	6,000 lbs.
Autocar Eq. Co.		4	Water...	Sliding...	Chain.....	36 x 3 1/2" & 4" Solid..		Sight-Seeing.	20 Pas'grs.
Autocar Eq. Co.	50	4	Water...	Sliding...	Chain.....	36 x 5" & 7" Solid..	120"	Truck.....	10,000 lbs.
Autocar Eq. Co.		4	Water...	Sliding...	Chain.....	36 x 3 1/2"—42 x 4" Solid	100"	Brougham...	10 Pas'grs.
Johnson.....	Steam.			Sliding...	Shaft.....			Trucks.....	1 to 5 tons.
Hewitt.....	30	4	Water...	Planetary..	Chain.....	36 x 5" & 8" Solid..	168"	Truck.....	10,000 lbs.
Matheson.....	30	4	Water...	Friction...	Chain.....	36 x 6" Solid..	96"	Truck.....	10,000 lbs.
Am. M. Mfg. Co.	30	4	Water...	Selective...	Chain.....	Solid.....		Truck.....	5,000 lbs.
Iroquois.....	45	4	Water...		Chain.....	Solid.....		Sight-Seeing.	15 Pas'grs.
Iroquois.....	60	4	Water...		Chain.....	Solid.....		Truck.....	10,000 lbs.
Reliance.....	30	2	Water...		Chain.....	Solid.....		Truck.....	1 1/2, 2 & 3 tons.
Couple Gear...	40	4	Water...	Electric...	4 Motors..	Solid.....		Truck.....	10,000 lbs.
Rockcliff.....	18	2	Water...	Planetary..	Chain.....	36 x 3" Solid..	126"	Truck.....	6,000 lbs.

DETAILS OF AMERICAN ELECTRIC COMMERCIAL VEHICLES

CAR	Motors	Cells in Battery	Drive	Tires	Type	Capacity
Pope-Waverley..	1	42	Chain.....	32 x 3—36 x 3"....	Delivery.....	1,000 lbs.
Pope-Waverley..	1	40	Chain.....	30 x 3".....	Light Truck..	1,000 lbs.
Pope-Waverley..	2	42	Chain.....	36 x 3—42 x 3"....	Light Truck..	2,000 lbs.
Pope-Waverley..	2	42	Chain.....	36 x 6—42 x 6"....	Heavy Truck..	10,000 lbs.
Pope-Waverley..	2	42	Chain.....	36 x 5".....	Heavy Truck..	6,000 lbs.
McCrea Motor Truck Co.	2	44	Chain.....	42" Wood or Steel.	Truck.....	12,000 lbs.
McCrea Motor Truck Co.	1	22	Chain.....	36 x 2 1/2".....	Delivery.....	1,000 lbs.
General Vehicle Co.	1	44	Chain.....	32 x 3".....	Delivery.....	1,000 lbs.
General Vehicle Co.	1	44	Chain.....	36 x 4".....	Light Truck..	2,000 lbs.
General Vehicle Co.	2	44	Chain.....	36 x 6".....	Heavy Truck..	7,000 lbs.
General Vehicle Co.	2	44	Chain.....	36 x 7—36 x 48"....	Heavy Truck..	10,000 lbs.
Studebaker.....	2	40	Chain.....		'Bus.....	14 Passengers
Studebaker.....	2		Chain.....		Delivery.....	1,000 lbs.
Studebaker.....	2		Chain.....		Truck.....	2,500 lbs.
Studebaker.....	2		Chain.....		Ambulance...	
Studebaker.....	2		Chain.....		Truck.....	7,000 lbs.
Lansden.....	1		Chain.....	32 x 2 1/2".....	Delivery.....	1,000 lbs.
Lansden.....	1		Chain.....	32 x 3".....	Delivery.....	2,000 lbs.
Autocar.....		42	Chain.....	36 x 3 1/2".....	Sight-Seeing..	24 Passengers
Lansden.....	1		Chain.....	36 x 4".....	Truck.....	4,000 lbs.
Lansden.....	1		Chain.....	36 x 5".....	Truck.....	6,000 lbs.
Commercial.....	4	42	Gear.....	36 x 6" Wood.....	Truck.....	10,200 lbs.
Commercial.....	4	42	Gear.....	36 x 6" & 7"....	Sight-Seeing..	30 Passengers
Couple Gear...	4	44	Gear.....	36 x 7".....	Truck.....	10,000 lbs.
Commercial.....	4	44	Gear.....		Truck.....	8,000 lbs.
Commercial.....	4	44	Gear.....		Furniture.....	6,000 lbs.

CHICAGO A GREAT AUTOMOBILE CENTER

CHICAGO, Jan. 28.—To-day Chicago, the metropolis of the West, stands out as a great automobile center. The industry here has spread to such an extent in the past few years, in a remarkably short time, in fact, that it is recognized the country over as second only to New York in this respect. And in many ways it does not have to bow the neck even to the Gotham city. A casual visit to the district of this city designated as "automobile row," from Twelfth street to Sixteenth along Michigan, would be more than enough to demonstrate to anybody that such is the case.

The industry here has grown and extended by jumps until it forms no small part of the city's greatness. Nothing is done by halves in this thriving center of business, and this extends over every phase of industry. When it is said that nearly one hundred automobile firms are situated here within a comparatively small radius, the extent of the business done can be determined in a vague way. Chicago is essentially a distributing point as regards automobiling, yet it is coming along rapidly as a manufacturing center of cars. In a few years it is probable that many large factories of reputation will be centered here.

By virtue of the city's situation comes its adaptability as a distributing point. It supplies the Northwest, the West, in some cases as far as the coast, and in others to Denver, the Southwest and the South. Most of the manufacturing companies have their Western agents here, who in turn allot the different territories to other agents throughout the country. Moreover, Chicago is near the center of the manufacturing district, Detroit, Michigan. All of these advantages have placed Chicago in the position which it now occupies in the automobile world.

In the city itself there is a great deal of business done. Thousands and thousands of automobiles are owned here, and the presence of so many wealthy men makes the industry a permanent one. Taking all of these considerations together it is not surprising that the large number of dealers have become pressed for quarters in so short a time. Firms have moved in here with small accommodations, have extended them in the course of a year or so, repeated the process, and are now at a loss what course to pursue. Rents along Michigan avenue have been doubled in most cases in the past five years, due to the persistency in which the automobile dealers have been grouping together.

This grouping of the dealers forms an interesting page in the history of the industry's growth in Chicago. Some few years ago Wabash avenue was "automobile row." There were but few firms here in those days, and they extended all the way from Adams street on the north, to Harrison or Peck court on the south. Then three firms, the Winton, the Locomobile and the Woods took quarters on Michigan avenue in the neighborhood of Twelfth and Thirteenth streets. Others finding that situation an ideal one from a business standpoint, being on a well-paved street and away from the loop district, began to follow the pioneers' example, and one by one they moved into adjoining quarters, until now but two or three remain on Wabash avenue, and they will probably vacate in the near future. Thus was the new "row" brought into existence and extended.

As new firms came in they also took their station on Michigan avenue, until now the "row" is not bounded by Twelfth and Seventeenth streets, but by Harrison and Twenty-second streets. In fact, but a few days ago a firm, whose name was not given out, has taken a lease of property at 2223 Michigan avenue. In time this whole line will probably be devoted almost exclusively to the automobile and allied interests, the gaps filling one by one.

Another indication of the extent of the industry here is the large number of dealers in accessories now established here. In some cases firms have built entire buildings, using a part of them for their own use and renting out the remaining portion. This is especially the case of some of the tire dealers. Anything that pertains to the automobile can be purchased here in large quantities, and Chicago is also the distributing point of most of these big firms.

The fact that Chicago has come to be regarded as an automobile center attracts thousands of would-be buyers here every year, and especially has this been the case during the season just passed. Hotel men have emphasized the fact that large numbers of their customers have come here for the express purpose of looking over cars with an idea of purchase. Some come from as far south as New Orleans, and it is not at all startling when a man arrives here from San Francisco or even Mexico City with that end in view. The salesrooms of the dealers are thronged with interested persons daily, and the demonstrating cars are kept in use all the time.

One fact alone which assists the spread of automobiling here in the city, is the presence of excellent boulevards, park systems and country roads surrounding the city for a radius of fifty or seventy-five miles. Side trips to such places as Joliet, Aurora, Hammond, Ind., Kenosha, Wis., and various summer resorts, keep the interest in automobiles up, and stimulates local citizens to purchase cars.

An institution which has also boosted the trade conditions here is an association, formed among the dealers themselves, called the Chicago Automobile Trades Association. This body is formed for the purpose of promoting automobile events that will bring the game before the notice of the public. Hill climbs, endurance runs, economy tests and the like come within its province, and it has already stimulated the game here to a marked degree. It works in harmony with the Chicago Automobile Club, which is essentially a social organization.

The Chicago Automobile Club has done a great deal toward making automobiling in Chicago such a distinct success. It has grown to be a leader in automobile affairs throughout the country, and perhaps ranks second to the organization at Gotham City. It has promoted mammoth meets in the past, and has made a specialty of runs and tours to towns and cities in the neighborhood of Chicago. It is the presence of such a splendid body as this that has helped in a great measure to make Chicago a real center of automobiling.

Aside from business features the situation of this great city makes it such that it is the natural point for the touring autoist to head for. Long runs from New York to Chicago have been frequent, and also from Chicago to the Eastern city. Transcontinental tourists pass through the Windy City, and parties from all over the country, in fact, make it their halting point. These people find Chicago an ideal spot for the automobilist. Both from a social and a business outlook Chicago stands out preeminent, and, what is more, it has a future than can scarcely be conceived of.

In many respects its future appears now even greater than that of New York city, due mainly to its location. New York is too far from the western cities to make much of a mark there, but Chicago, standing midway, as it were, has the country to conquer. The citizens of Chicago recognize this fact, and so do the civil authorities. Much attention is paid to the affairs of the autoist, and his claims are looked into carefully. The city recognizes the fact that a decided interest in automobiling is bound to help the city in more ways than one, and will do everything to foster it.

HONEYCOMB RADIATORS—THEIR CONSTRUCTION*

By L. BAUDRY DE SAJNIER IN OMNIA.

In a preceding article a description was given of the construction of a winged-tubed radiator like that used on the winning car in the last Vanderbilt race. In the present study, the other kind—the honeycomb radiator—will be considered.

The honeycomb radiator would be perfect if it did not leak. It has a considerable radiating surface, for it offers in a small space an enormous surface of exchange of temperatures between the water and air; in other words, it has the power *par excellence* of rapidly lowering the temperature of the water circulating within it. But when it is constructed entirely by hand it becomes

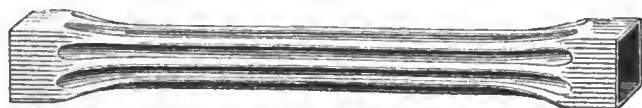


FIG. 1.—Honeycomb single radiator tube, actual size.

a precarious apparatus, for the simple reason that, being composed very often of five or six thousand elements, which ought to be soldered together, it cannot escape human imperfections; a little solder missing here and there through stupidity, carelessness or awkwardness of a workman, and you have a detestable apparatus. The imperfection may be discovered during the tests. But more frequently the hand-made honeycomb radiator is watertight when first tested, and only develops a chronic leak when it has undergone a little road shaking.

Hand soldering is the first honeycomb vice. The manner in which the tubes are assembled is often the second. It is impossible to deal here with all the methods of uniting honeycomb radiator tubes. Among them are many which simply join the

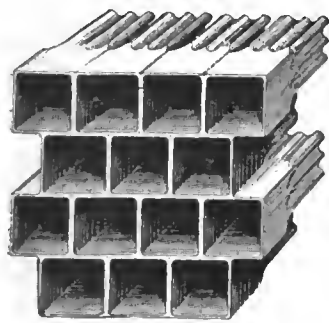


FIG. 2.—Front view of tubes in position.

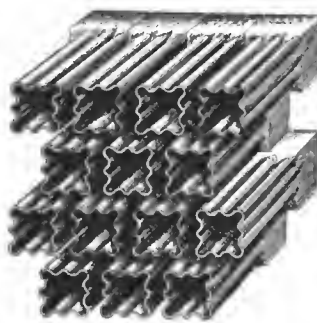


FIG. 3.—Sectional view of tubes cut in center, showing water circulation space.

parts together by soldered points. Large, flat surfaces should, on the contrary, be employed, so that the complete radiator forms, as it were, a hollow block in which have been bored an infinite number of small channels for the passage of air. In this metal block, the form of which may be varied infinitely, the water enters from above and passes downwards, zigzagging between the small tubes through which air is drawn by the revolving fan in their rear.

As will be seen, the tubes are separated one from the other by a space of one or two millimeters, to allow the water to circulate. Some constructors obtain this separation by two thin, perforated plates, each of which carries an end of the tubes in front and behind. Solder is run round the head and tail of each tube.

In one of the best French radiators, the Establie, employed among others on Panhard automobiles, a different and simpler method is followed. Copper tubes 3-10 millimeters in thickness are used. They are fluted into a shape somewhat resembling a

Maltese cross (Figs. 2 and 3), with a view to increasing the air and water surface. These tubes have a uniform length, Fig. 1 being a full-sized drawing of a 3 1/4-inch tube of 3/8-inch side measurement.

It is necessary to change these fluted tubes, so that their ends shall touch, while their bodies remain separated, for the necessary passage of water. By means of a special machine the fluted end of each tube is opened out to give it a square form, as in Fig. 4. The constructor has now a number of tubes, the two extremities of which are larger than the body, so that when assembled the ends only touch. No cage, platform or network is needed to consolidate the tubes. This form of construction unites simplicity and solidity, for it gives to the extremities of the tubes very large contact surfaces, as is shown in Fig. 2.

The tubes are placed side by side, and built up brickwise. In addition to greater strength, the efficiency of the radiator is increased by this arrangement, since it causes the water to descend in zigzag instead of in a vertical line. The horizontal surface of each tube is also more efficiently utilized.



FIG. 4.—Square end of tube.

Should one of the tubes spring a leak, which is very improbable, a repair can be readily made. A smaller size tube is pushed within the defective one (Fig. 5), and its fluted sides flattened out with a screwdriver or a piece of wood, assuming the form shown in Fig. 4.



FIG. 5.—Repair of broken tube.

Automobile bonnets and radiators have, as everybody knows, a variety of shapes; the united tubes should therefore have the outline necessary for the type of car on which it will serve. The bundles of tubes are locked up in iron frames (Fig. 6) very similar to the chases used by printers all over the world for locking up their forms, fitted with an inner metal frame cut out to the shape of the automobile hood. When locked up, the frame is placed on a flat surface, and one of its faces soaked in a bath of chloride of zinc. By means of the four bars shown in the engraving the frame is placed in the longitudinal opening of an oven (Fig. 7) and the ends of the tubes dipped into a bath of molten metal. The dip should be long enough to allow the soldering metal to penetrate between all the joined surfaces, but not so long as to cause any deterioration of the tubes. The frame is withdrawn, turned over, and the opposite end of the tubes treated in the same manner. The block of the radiator is now formed; all the soldered surfaces have necessarily the same force. After a thorough washing in water, the block of tubes is fitted into a metal frame, forming water tank. This reservoir is provided with suitable divisions forcing the water to descend through the whole series of tubes.

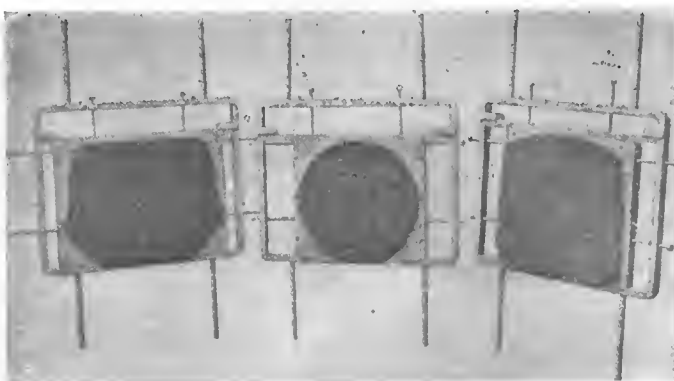


FIG. 6.—Tubes assembled in frames before soldering.

* Translation, by W. F. Bradley. A continuation of the subject of "Radiators," published in "The Automobile," November 8, pages 609-610.

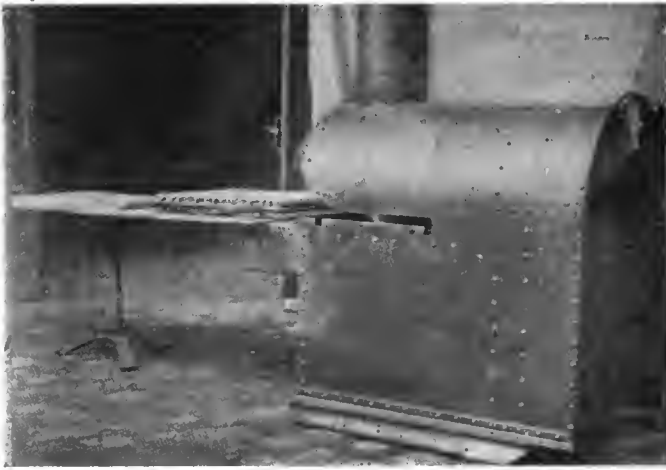


FIG. 7.—Side view of oven equipped with soldering bath.

Before being put into service each radiator is tested in the same way as a pneumatic tire. The outlet is corked up, a rubber tube fitted over the inlet, and the radiator put into a tank of water. Air is pumped in, and if no air bubble rises to the surface of the water the radiator is passed as fit for service.

Radiators vary in width and height, according to the size of the engine for which they are intended. In addition, the length of the tubes varies between three and six inches, their sectional area being correspondingly increased or decreased. It is generally admitted that a half-meter square of radiating surface is necessary per one horsepower for a four-cylinder motor. For a monocylindric or a two-cylinder engine the amount would have to be increased; for a six-cylinder engine it could be decreased. Between 10 and 50 horsepower this formula is generally exact.

Beyond certain limits the increase of the external area of the radiator is an impossibility. A large radiating surface must then be obtained by making the tubes longer or more numerous, thus increasing, within the same external area, the amount of metal coming in contact with the water and air. The longer and thinner the tubes for a given external area, the greater the cooling power. French constructors generally employ tubes about 3-10-inch side measurement. Certain Italian builders have taken much smaller tubes in order to augment the radiating surface, but experience has shown that very small tubes offer a serious resistance to the passage of the air, and that they are apt to choke with dust and mud.

A standard French honeycomb radiator for a 14-horsepower engine consists of about 2,000 tubes 3 7-8 inches long. A radiator for a 35-horsepower engine contains 5,000 tubes. One thousand small tubes 3 7-8 inches long hold within them about 1 4-5 pints of water. A bundle of large section tubes holds a quantity of water equal to about half the volume which it represents.

The method of soldering employed on the radiators just described is far less susceptible to heat than is generally imagined. Thus the cooling water could be drawn off and the engine run until the cylinder heads are a bright red (800 degrees) without the radiator showing the least sign of melting.



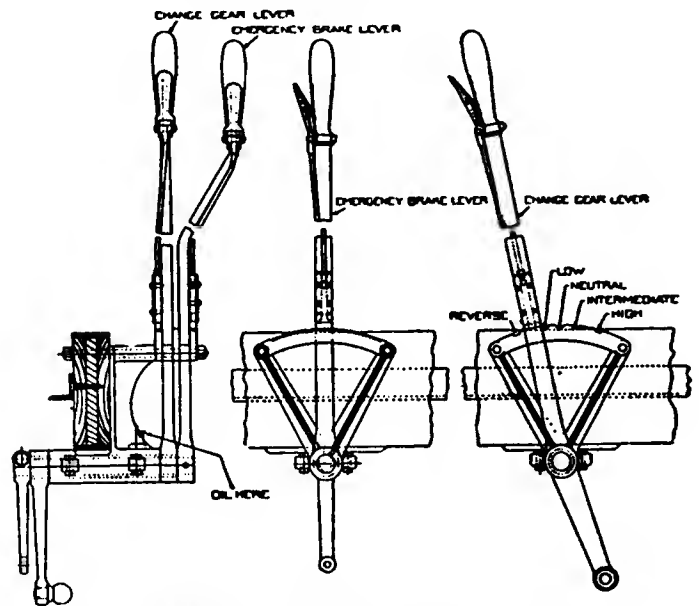
FIG. 8.—Radiator that withstood overturn of car. The tubes were uninjured.

notwithstanding its proximity. The layer of air between the engine and radiator is such a bad conductor of heat that it would never communicate the 300 degrees necessary to melt the solder. If a radiator were frozen, a soldering lamp could be passed over its surface without danger. The ice would change into water, and, if the experiment were continued, into steam, but the lamp would never be able to give sufficient heat to melt the solder.

As an instance of the solidity of this type of radiator, Fig. 8 will be noted with interest. The car on which this radiator was fitted overturned into a pit. The lugs and water inlet were broken off, the reservoir rendered practically useless, but the tubes remained intact.

A NOVEL SLIDING GEAR CONTROL.

A rather interesting departure from previous systems of sliding-gear control is that used for the first time on the 1907 Franklin cars, the arrangement being that shown in the illustration. As is well known by every one who is experienced in the manipulation of a gear of this character, the necessity for manipulating the latch in passing from one speed to another is the chief point in which the progressive system of gear changing is less desirable than the selective system, and doubtless accounts for much of



▲THREE VIEWS OF FRANKLIN SELF-FINDING GEAR SHIFT.

the increasing vogue of the latter. By the Franklin construction, manipulation of the latch is required only in passing from the intermediate to the high or low speeds and in passing from the low to the reverse. All other changes are effected simply by pushing or pulling upon the lever, without unlatching. To secure this result, no complication of mechanism is involved, the alteration from the construction previously used consisting of nothing more radical than a beveling of the edges of the notches on the sides from which the lever is required to move without manipulation of the latch. An ordinary plain sector is used, with notches—from front to back—for high, intermediate, neutral, low, and reverse, as shown in the drawing.

GROWTH OF THE FRENCH INDUSTRY.

The French automobile industry during the last year has continued to make remarkable strides. Some idea may be gathered of the progress made by a compilation of the statistics of exportation, which have just become available, which show that the exportation of French machines during the first nine months of 1906 exceeded those for the corresponding period of 1905 by 33,841,000 francs; the total exportation amounted to 126,451,000 francs, against an importation of foreign cars of only 7,150,000.

LETTERS INTERESTING AND INSTRUCTIVE

A Trouble with Peculiar Symptoms.

Editor THE AUTOMOBILE:

[550.]—Will you kindly aid me in the following question: I have a standard double-opposed runabout made by a prominent New York firm, jump spark ignition, water-cooled. After one of the periodical trips to the factory for repair, it was returned with its present trouble; the makers, after expensive experimental attempts at repair, return it in the same condition, look wise, and say nothing, but charge promptly. The car runs well on the floor, noiselessly and with regular explosions at all speeds, with throttle and spark in any position. It does the same in running at slow speed (planetary). At high speed (direct drive) it runs well, with the spark retarded, irrespective of the quantity of gas allowance. The moment, however, the spark is advanced, a pounding results in one cylinder, and advancing spark still more, in the second cylinder. If, however, I advance spark very gradually there is no pounding whatever. Again, driving at high speed, with gas throttled, and spark gradually advanced to the maximum, it runs well; however, on the moment of allowing a trifle more gas, immediately the pounding commences, and continues till the car gains a fair speed, then the pounding ceases. The pounding is one of pre-ignition, as it is the same when the spark is too far advanced. The car is new and has run less than four months, and is of 1906 make. All bearings in motor are snug; storage battery; compression good; valves newly ground; spark is rich; timing apparently correct; exhaust piping clean. Moved easily on the floor by hand; cranked easily with stopcocks open. What causes this apparent lack of power?
A SUBSCRIBER.

Chicago, Ill.

Though you state the symptoms of the difficulty with your car with considerable fullness, they nevertheless fail to enable us to make a positive diagnosis, so we shall have to confine ourselves to a few general suggestions, leaving it to the ingenuity and experience of our readers to discover perhaps the detailed nature of the trouble that confronts you. Our first suspicion, which we have hopes may be confirmed by further investigation upon your part, is that there is nothing the matter, unless possibly a slight variation in the timing between the two cylinders. This condition may, however, be complicated by positions of commutator contact slightly ahead of what they should be at all speeds. Our reason for these theories is that most of the phenomena, as you state them, are perfectly normal for a motor of ordinary type. You say that "the car runs well on the floor, noiselessly and with regular explosions at all speeds, with throttle and spark in any position." This is all as it should be, if we assume that it is because of the flexibility of the unloaded motor that it changes "imperceptibly and without pounding to adapt itself to changes in spark and throttle conditions. Likewise, "at slow speed," it should run without pounding. The fact that at high speed "it runs well, with spark retarded," seems to indicate that the interconnection between spark lever and commutator is in such condition of adjustment as to make the spark appear greatly advanced when it really is not so advanced. In the next three sentences of your letter you describe only the normal action of any motor, with one reservation, when the ignition is advanced too quickly under load. The reservation refers to the difference in time between the commencement of pounding in one cylinder and its commencement in the other. This may be taken as evidence of the previously suggested minor maladjustment within the commutator itself. Look more carefully for some sign of this condition, drive without attempting to produce sudden acceleration by spark manipulation, and watch this column for the opinion of some bright reader who may be able to show us we are both wrong, and we venture to predict that your troubles will soon be at an end. In your final question we note that you refer to an "apparent lack of power," which you do not mention elsewhere in your letter. Do you simply assume from the other considerations you mention that such lack of power exists, or is it definitely a fact that the engine does not "pull?"

The Characteristics of Hot-wire Ignition.

Editor THE AUTOMOBILE:

[551.]—In the course of reading various material that has appeared in the trade periodicals and the various volumes that have been devoted to gas engineering, I have run across various references to "hot-wire ignition," but nowhere have I been able to find a description of such an ignition system, or any extended statement of its advantages and disadvantages. So, as a subscriber to and an interested reader of "The Automobile," I venture to ask if you will devote some space in your columns to an exposition of this subject, in which I believe others as well as myself are apt to be interested.
CLINTON L. HARGREAVES.

Hot-wire ignition has never found more than occasional or experimental application to gas engines, and we know of no case of its application to automobile engines, so it is only natural that it should not have achieved extensive treatment in the literature of the subject. In the only instance we can recall of its use, it took the form of a platinum-wire cage, maintained at a cherry-red heat by the passage of an electric current through it. As in the case of the better known hot tube, the contact of the mixture with the heated surfaces brings about ignition very effectively at the moment of such contact. Unlike the hot tube, however, in which the very construction itself is such as to make any similar protection unnecessary, the hot wire must be shielded by some sort of movable shield in the ordinary type of internal combustion motor to prevent ignition during the suction of compression stroke. Besides this difficulty of timing hot-wire ignition, there is the materially greater current consumption to be reckoned with. It has been proposed, with a prospect of success that may be very real within a year or two, to combine certain modification of the present cycles of internal combustion engine operation with the use of an ignition system involving only a very short and small diameter wire, kept hot by a storage battery or dynamo current. The slight increase in current required, it is argued, would be more than offset by the elimination of coils, vibrators, commutator, etc., none of which can very well be claimed to make for either simplicity or reliability, while the timing problem would be solved in the modifications of the engine cycle. In a series of articles soon to be published in THE AUTOMOBILE, we shall devote considerable space to this interesting subject.

Our Correspondent Must Judge for Himself.

Editor THE AUTOMOBILE:

[552.]—As a subscriber to your journal, I would like to ask a few questions. Would you advise the purchase of a car with six cylinders such as the Ford company makes, or would you choose a four-cylinder car in preference? I simply mentioned the Ford Company's name because they manufacture such a car, though I presume there are others as well. Also, do you think a two-speed planetary transmission is the proper thing for a six-cylinder car, or would you prefer the sliding or selective type? Can you give me a list of manufacturers who make six-cylinder motors to sell to automobile makers?
F. F. MILLER.

Akron, O.

There is as much difference of opinion as to the relative advantages of the six and four-cylinder types of cars as there is concerning what constitutes beauty in a woman, and, as you would have to depend on your own personal opinion in the latter case, so you will also in the former. Why not ask someone who has had experience with a six-cylinder car? Give him free rein, and let him tell you all about it; then go to someone else who has had sufficient experience with a standard make of four-cylinder car and do likewise. If you have the time and opportunity to repeat the process several times in each case, so much the better. You can then be safely guided by the preponderance of evidence on either side after you have balanced the accounts. As to the suitability of the planetary gear in such a situation, all

we can say is that the design in question is that of a well-known engineer; it was not adopted haphazard, but only after thorough trial, and, as after a year's experience with it on a number of cars, he has seen fit to continue it unaltered this year, there appears to be no reason to doubt its efficiency. We may add that it is a more "foolproof" type than the others. We cannot help you out on the last question; probably some of our advertisers in that line may be able to do so.

An Interesting Case of Responsibility.

Editor THE AUTOMOBILE:

[553.]—The "Literary Digest" of January 12, in a series of interesting items relative to automobile accidents, contains the following excerpt from a recent issue of "The Automobile":

"An agent's driver left a car this way at the curb facing one belonging to another agent, and which stood about fifty feet away. One of the usual type of hangers-on about the garage began to monkey with the side levers, and before he realized what he had done the car started off at a good pace down the avenue. It brought up against the second car with a crash, and the resulting damage led to legal proceedings in which the plaintiff was worsted, owing to the non-liability of the defendant for the acts of the irresponsible person who was the moving cause of the damage."

The case referred to appears to be analogous to a case that I have at present in the courts here, and I shall be very glad if you can give me the title of the case, and the name of the court in which the same was determined. The "Literary Digest" does not give the date of the publication from which the quotation is made, but I trust that you can give me the desired information without putting yourselves to much trouble.

Denver, Col.

HENRY H. CLARK, Counsellor at Law.

The incident you refer to appeared in THE AUTOMOBILE, under the caption of "How Not to Leave a Car," as the accident in question was the result of leaving a car at the curb with the motor running and the gears in engagement, nothing but the emergency brake holding the clutch out. As the brake in question is operated by a side lever, its release is a natural result of tampering with the latter, and as this permits the clutch to engage, the car will start if the gears of the transmission are in mesh. The action lay between two of the Chicago representatives of leading manufacturers, and as the amount claimed was small, it was probably not brought in a court of record. We cannot cite the case, nor state the court it was brought in, nor can we say whether the matter was ever carried any higher.

Shock Absorbers as a Standard Equipment.

Editor THE AUTOMOBILE:

[554.]—There are numerous shock absorbers advertised in your magazine, claiming to be proof against the breakage of springs, etc. If this is so, why are they not generally adopted by the manufacturers of automobiles?

A SUBSCRIBER.

Sleepy Eye, Minn.

This is a question that only the manufacturers themselves can answer satisfactorily. Probably it is because the shock absorber originated as an accessory and still remains in that category; it has not yet reached the status of forming an integral part of the standard equipment of the average car. It may be added for your information that there are a number of manufacturers of well-known cars who have decided to fit their cars with shock absorbers regularly.

Putting a Condenser on a Small Steamer.

Editor THE AUTOMOBILE:

[555.]—I have a small steam runabout, and would like to know the practicability of putting in a condenser by dropping the exhaust to bottom of water tank through coil and place drip through tank to pump placed below, rising again with the exhaust to the open air.

Atlantic City, N. J.

JOHN W. TAYLOR.

There appears to be no reason why such an expedient should not prove successful, though it would seem that unless such a condenser can be built or purchased at a comparatively low cost, the benefit to be gained would hardly warrant the outlay. If possible the tank should be placed in such a position that the cooling water may be kept at as low a temperature as possible, as on this will depend the efficiency of the condenser.

Wants to Know About Self-Starting Devices.

Editor THE AUTOMOBILE:

[556.]—If, to your knowledge, there is no motor starter in existence, is there any desired by the manufacturers, and would you consider an invention of any great value, that would successfully start gasoline automobile and stationary engines from a standstill, dispensing with batteries entirely and using a small dynamo to furnish spark after engine is started?

Columbus, O.

FRANK FINSTERWALD.

There are quite a number of self-starting devices on the market for starting both automobile and stationary gasoline engines, and have been for several years. Various means are employed, such as springs, compressed air, gasoline and air, acetylene gas and air, carbonic acid gas and others. In spite of this, however, there would undoubtedly be a considerable demand for a device that was an improvement over any of the foregoing. None of those mentioned have met with any very general adoption, except for starting stationary engines.

Agricultural Implements That Are Motor-Driven.

Editor THE AUTOMOBILE:

[557.]—Will you kindly advise me if there is made in this country a machine used for agricultural purposes, such as plowing and heavy hauling? I understand that there is such a machine used quite extensively in England, and would like to know who makes them, as we have had applications for two of them.

Zanesville, O.

CHAS. E. FIX AUTO. COMPANY.

So far as we are aware, there is no such machine made in this country, using gasoline as a motive power, though portable gasoline engines are employed for agricultural work to the extent of many thousands. The English machines you refer to are made by Ivel Motors, Ltd. We understand that the International Harvester Company, Chicago, Ill., has been experimenting along the same lines, and as they are probably the largest builders of agricultural machinery in the world, can doubtless give you the information desired.

Roller Contact and Wipe Contact in Commutators.

Editor THE AUTOMOBILE:

[558.]—What are the respective advantages and disadvantages of the roller contact and the wipe contact in the modern commutator?

Watertown, Wis.

M. H. GAEBLER.

Generally speaking, wear is the greatest disadvantage of the wipe type of contact maker, though this refers more to the old time form of wipe contact maker, as numerous improvements have been made which have overcome this to a very great degree. The chief disadvantage of the roller type is the difficulty of making an adequate electrical contact, though no unusual amount of trouble appears to result from this cause in the modern timers of this class. The ideal timer is one that combines the efficient contact of the old time wipe type with the minimum wear of the roller or ball type.

THE FIELD FOR RESILIENT WHEELS.

Editor THE AUTOMOBILE:

[559.]—In conversation with Thomas L. White just previous to the Madison Square Garden show, he strongly insisted that the broad field for a resilient, but not pneumatic, wheel is a wheel for commercial purposes. It was made impressively manifest to the writer during the Garden week, by leading engineers of prominent builders, also, that the commercial field is a very broad and continually expanding one and well worth cultivating, but the query immediately presents itself to the inventive mind: What is the consensus of opinion of both manufacturers and users combined, as to what device will meet all the requirements? One engineer prominently connected decisively adhered to the opinion that any resilient wheel, rubber covered to give traction, would meet popular favor, yet in less than one hour another, equally as prominent, determinedly insisted that any form of wheel for commercial use having rubber as a component part is not to be considered for permanent and economical adoption. Which was right? It is such diversity of opinions as quoted that places the progressive inventor between the devil of doubt and the deep sea of uncertainty. Having patented a resilient but not pneumatic wheel for pleasure pur-

poses which has met public approval, as manifested by orders received during show week, and which was illustrated and described in the October 26 issue of "The Automobile," it intuitively presents itself as a reasonable proposition and conclusion that a wheel can be produced in the immediate future that will conform to any and all intelligent demands, when it is once made known exactly what is required. The extreme variations of weight of load to be carried is a complex and difficult problem, for it is assumed that a truck may leave the warehouse or shipping room with one load weighing, say, five tons, and the succeeding load may weigh less than one ton, but sufficient resiliency must be maintained under these widely divergent approximate loads to give satisfactory results and meet public approval. Probably no pneumatic or solid tire has been produced that gives equal resiliency under such varying loads, and while it may be possible, yet it appears wholly improbable that such a device will make its appearance. A wheel to be equally resilient in conveying the maximum and minimum load over every conceivable construction of road must of necessity be provided with a compensating appliance which will adapt itself to constantly varying conditions.

This communication will have met its express purpose if it produces definite information from intelligent and progressive founts of knowledge through the columns of "The Automobile" or otherwise.

H. S. PULLMAN.

Meriden, Conn.

FROM AN ADMIRER OF THE "HORSELESS AGE."

Editor THE AUTOMOBILE:

[560.]—The venom of your attack upon the editor of the "Horseless Age," in your issue of January 10, rather suggests that it was provoked by the sting of truth. In commenting on your editorial, I should like to point out that the fact that a certain article will "sell" is not, of itself, a conclusive argument in its favor, except from the point of view of those who market the article. Opium, indecent literature, and many other undesirable commodities would, if permitted, command large sales. Similarly, children, if at liberty to do so, would maintain a flourishing market for all sorts of improper playthings, which would be a menace and nuisance to everybody else. This is about the situation with the high-powered runabout, except that those who buy them are, on account of their years, not supposed to be children.

I am not saying that the high-powered runabout is, in itself, a menace and a nuisance, as it can be and often is handled with as much temperance as the high-powered touring car. But the fact remains that a 50 or 60-horsepower car, costing from four to five thousand dollars and capable of accommodating only two, or at most three, persons, is not a sensible, legitimate, or sane form of vehicle and, in general, appeals only to the class of individuals who want to "cut a dash" with a car that is racy and sporty in appearance and who want to gratify their own ambitions with a machine that will give them the greatest speed for their money. "Greatest speed for the money" is the only real excuse for the high-powered runabout, and were it not for speed maniacs and cheap sports, sales of this type would cut a small figure.

It is therefore the nature of the demand this vehicle caters to, and not the vehicle itself, that causes sober-minded automobilists to disapprove of the present fad in these "hell wagons," as they are so aptly termed. It is not a healthy demand and, therefore, the makers are short-sighted in booming it as they are. As the fad is in full swing, however, the best way to get rid of it is to let it run itself into the ground. When the high-powered runabout is no longer "swell," it will not be extinct, nobody wants it to be, but it will receive only the attention it deserves.

As to your arguments on the alleged merits of this type, they are a sham and you know it. They may apply to the runabout construction, but that does not justify the retelling on a wholesale basis of road racing machines to be used more or less as such on the roads and streets every day of the week and perhaps twice on Sunday. Also it may not have occurred to you that the seats of a runabout are no more between the two axles than are the front seats of a touring car. Furthermore, the weight of a tonneau, which is not "several hundred pounds," in the sense in which it is apt to be understood, is inconsiderable to a car of 60-horsepower.

And don't you worry about the editor of the "Horseless Age." He and his paper are all right and have the right idea on this question, as on racing and every other question they have ever tackled. The paper is made up of news and unbiased and intelligent comment, and is not guided in its policy by any interest in the "selfish point of view of those who market the article." I am not influenced in this letter by any partiality, as I am not personally acquainted with the editor of the "Horseless Age," and do not read his paper any more than I do some of the other automobile journals. That I am not personally acquainted with him, however, will not prevent me from sending him a copy of this letter.

Cambridge, Mass.

DEMAREST LLOYD.

CURRENT CONSUMPTION AGAIN CONSIDERED.

Editor THE AUTOMOBILE:

[561.]—I read with a good deal of interest C. T. Jones' letter on Current Consumption (543), as it seems to bring up a good many interesting points. As a matter of fact, the current required to properly spark an engine for a given time increases in direct proportion as the speed increases. On the other hand, with the ordinary forms of timer and vibrating coils the amount of current consumed by an engine while running a given time will be practically the same no matter at what speed the engine be run.

In some special forms of timers, such as the Atwater-Kent, in which the time of contact per spark generated is the same, regardless of the engine speed, the current consumption increases in direct proportion to the speed of the motor. However, in certain instances the current consumption may actually decrease to a slight extent as the speed of the motor increases.

To illustrate, before the core of a coil is sufficiently magnetized, so that, when a break in the primary circuit is made, a sufficiently strong spark will be created at the plug, the current must pass in the primary for a certain time. This amount of time depends on the construction of the coil and upon the voltage of the current used. Furthermore, the magnetic inertia of the core tends to resist the flow of current in the primary so that the amperage of the current flowing in the primary will gradually increase as the coil becomes magnetized. The time required for the current flow to reach its maximum is somewhere between one one-hundredth and one one-thousandth of a second. Let us now suppose that the primary circuit is broken just as the amperage reaches the maximum, then the average current flow will probably be somewhere near one-half the maximum flow. However, let us suppose that the circuit is not broken until a short time after the current has reached its maximum, then the average amperage of the current flowing will be considerably raised. Let us now apply this reasoning to the case of a non-vibrator coil and the form of circuit breaker that is commonly used on a motorcycle. Let us suppose that the time of contact is so adjusted as to be just sufficient to form a good spark at a given speed. Let us now slow the motor down to one-half that speed. Then the number of contacts in a given time will be decreased just one-half, but the duration of each of these contacts will be doubled so that the total time of contact will remain the same whether the motor runs fast or slow. However, as has been shown, the average current flow has been raised, therefore the total current consumption has been raised by slowing down the motor.

In case a vibrator coil is used, then the situation will become slightly more complicated; however it is practically true in both cases that, with ordinary timers, the consumption of current is the same for a given time, regardless of the speed of the motor. The waste of current at the slower speeds of a motor is something surprising.

Let us say that a motor capable of turning up to 1,200 r.p.m. has a commutator designed for just sufficient contact to give a spark at this speed. Let us suppose that the motor is slowed down to, let us say 400 R.P.M., in this latter case three times the current is being used as is actually needed. Formerly some of the Columbia cars were fitted with a timer in the design of which cognizance was taken of this fact, it being so designed that as the spark was advanced the arc of contact was increased, the idea being that spark advance generally meant increased speed.

Mr. Jones also makes the very common mistake of confounding battery life with current consumption. A dry battery will give a much greater number of ampere hours' output if the work is of an intermittent nature than if it is more continuous. Both dry and storage batteries tend to give a greater ampere hour output if the discharge rate is kept fairly low. It is probable, therefore, that battery consumption is slightly greater at high speeds than at low in the case of dry batteries, but that with storage batteries there is little or no difference at high or low speeds under ordinary conditions.

HAROLD H. BROWN.

Boston, Mass.

GERMAN MOTORS OFFICIALLY RATED.

The rating of internal combustion motors has been made the subject of an Imperial Treasury investigation in Germany, and as a result automobile motors are now to be rated by the formula, N equals $0.3 id^2s$, in which N is the horsepower, i the number of cylinders, d the diameter of the cylinder, and s the stroke, the quantities being expressed in metric terms. The formula is based on a speed of 900 r. p. m. and a mean pressure of 3.8 kilogrammes per square centimeter. This official formula of the German Government used for levying the horsepower tax has also been adopted by the Automobile Association of Central Europe.



OPERATING SIDE VIEW OF MODEL 25, RAMBLER TOURING CAR, 35-40 HORSEPOWER.

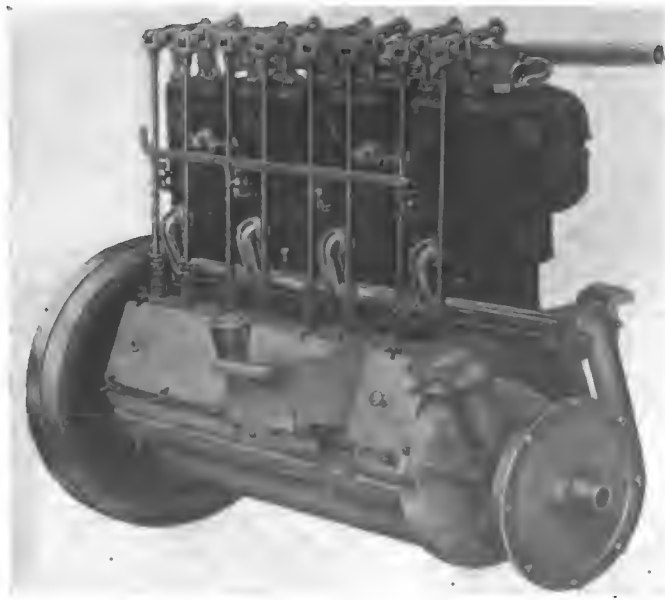
FOR the present year the Rambler line will consist of a double opposed runabout, known as Model 17; a utility car with double-opposed motor, designated as Model 21, and two touring cars with four-cylinder vertical motors, classed as Models 24 and 25. These two latter models are the most important of the Rambler line, and, while similar in general character to Models 14 and 15 of 1906 which they replace, show marked improvements in every essential feature over their predecessors. Model 25 is a large touring car with 112-inch wheelbase and standard tread, while Model 24 is a medium-weight touring car with many new, but thoroughly-tested features.

The four-cylinder motor of Model 24, developing 25-30 horsepower, has separate cylinders 4 1-2-inch bore by 4 1-2-inch stroke, cast with integral heads. The valves, which are assembled in separate cages and securely seated in the dome of the combustion chamber, are operated by rocker arms provided with adjusting screws, whereby the time and extent of opening is accurately regulated. The hardened valve cams are made in integral pairs for each cylinder, one adjustment thereby assuring the action of inlet and exhaust valves in proper relation to each other. The lift rods act through long bronze bearings provided with hardened steel rollers to prevent wear through contact with the cams. Inlet valves being set above the combustion chamber allow room for the spark plugs directly under the valves. By this means the plugs are always cool and clean. Four rings are provided on each piston, three being above and one below the

piston pin. Pistons and rings are given a mirror polish. Probably the most notable feature of this motor lies in the construction of the crank case and method of support. Instead of being divided horizontally at the center line of the crank case, the body of the case is built solid with a removable plate at the cam side. This plate covers the entire side of the case, extending downward from the top nearly to the bottom, leaving only a reservoir of oil. By removing this plate, the entire crank shaft, with all its bearings, as well as the cam shaft, is entirely exposed. The main bearings are three in number, of ample size, and of a special anti-friction metal that has such great wearing qualities that adjustment is unnecessary, even after a season's hard service. Three-point suspension is employed for the motor with a universal joint between clutch and transmission gear. At the forward end of the crank case is a sleeve, through which passes a steel

tube extending across the frame, the ends supported in trunnion blocks secured to the frame sides. At the rear of the case is a segmental bearing resting on a depending cross frame member.

Ignition.—Jump spark ignition is employed, the system comprising a six-volt, sixty-ampere storage battery, a four-unit coil located on the dash, and a roller-type commutator of special design. A leading feature is that the member to which the wires are attached is stationary, even when shifting the spark, thus avoiding breakage of wires and connections. After exhaustive tests the roller contact system has been adopted for all 1907 models. By the use of tool steel rollers and contact plates wear



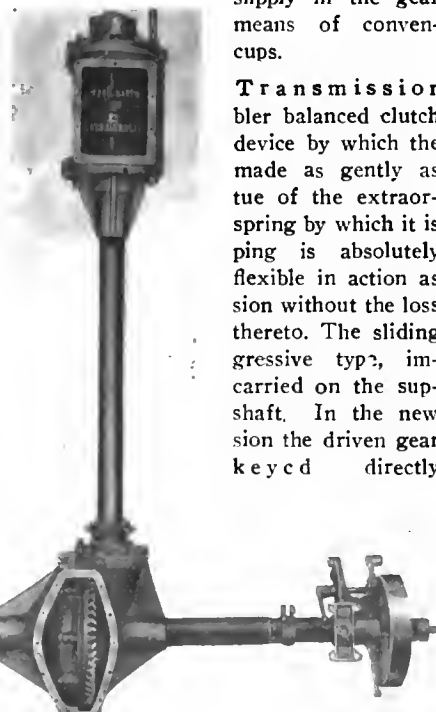
MOTOR OF MODEL 25, VALVE-OPERATING SIDE.

is almost eliminated, and absolutely correct synchronizing of ignition is attained.

Carbureter.—A new type of carbureter with automatic air control is now used. The gasoline feed is regulated by a float, with the nozzle concentric with the float, thereby removing all trouble incident to throwing the carbureter out of vertical alignment, as in running on a slanting road or steep grades. Air control is by three automatic valves with springs of varying strength. By this construction more accurate air adjustment is assured at different engine speeds than could be attained by varying compression of a single spring. Throttle control is by means of a butterfly valve in the inlet pipe to the motor. The gasoline tank is placed under the front seat, and is reached for filling by removal of the operator's cushion. Its capacity is fifteen gallons.

Lubrication.—The belt-driven, mechanical, force-feed oiler delivers measured quantities of lubricating oil to every point of friction. Parts other than those supplied by this oiler are, except the transmission gears, which supply in the gear means of conveniently located grease

Clutch and Gears.—The Rambler is an entirely new engagement may be desired, but by viridinary powerful finally seated, slip-eliminated. It is as a friction transmission of power incident gear is of the promersed in oil, and part of the propeller Rambler transmission one shaft is not



REAR AXLE AND TRANSMISSION, MODEL 24.

thereto, but is seated on the hub of a driving arm. This driving arm projects through the web of the driven gear with a play of about ten degrees, and allows the gear to yield slightly and permit easy engagement of the shifting gears. The arm is normally centrally balanced by springs projecting from each side and bearing against the shoulders, but when the car is in motion bears solidly against those shoulders in the direction of rotation. The propeller shaft bearings consist of two adjustable roller and one cylindrical bearing. The rear axle is of the floating type, with ball bearings at the inner ends and roller bearings in the wheels. The driving axles are of extra large construction with the spur gears of the differential forged on the inner ends. This construction eliminates the trouble unavoidable in separate gears, whether keyed or otherwise. Hand plates are provided in both transmission and differential gear housings, enabling adjustments to be easily made.

Cooling.—The Rambler engines are water-cooled, circulation being assured by means of a centrifugal pump located on the camshaft. A flat tube radiator is employed, with five-blade fan driven by belt direct from the motor shaft.



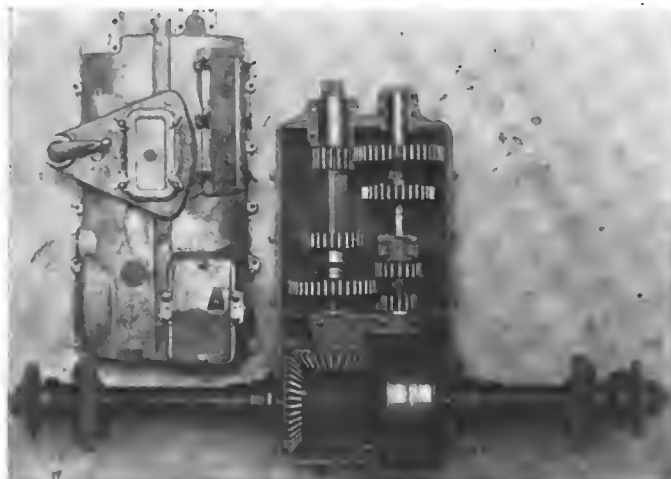
MODEL 25 MOTOR, INLET AND EXHAUST SIDE.

Control.—Motor control is effected by the familiar Rambler ring throttle under the steering wheel used in connection with separate levers for spark and auxiliary air control.

Wheels and Brakes.—Road wheels are wood artillery type, 34 inches in diameter, with 4-inch tires. Standard tire equipment is Hartford-Dunlop, but G & J, or Diamond, are optional. Two sets of brakes are provided, both acting upon drums, in the rear hubs. Primary brakes are applied by pedals; the emergency brakes, of expanding ring type, acting upon brake-drums of each rear wheel, are operated by side lever.

Model 25 is altogether of heavier construction than Model 24. The four-cylinder engine is 5 inches bore by 5 1-2 inches stroke, developing 35-40 horsepower. Change-speed gear is also of the sliding type, giving three forward speeds and reverse, with gears of large diameter, but the final drive is by chain to each rear wheel; the differential gear is enclosed in the case with the sliding gears. The transverse shaft carrying the driving sprockets rotates within tubular sleeves extending outwardly from the gear case and suspended from the side frames by drop-forged supporting blocks.

Bodies.—Both Models 24 and 25 carry handsome, well-finished side entrance bodies, upholstered in the best style, heavily padded with curled hair over ample springs. Model 24 is finished in pearl gray with buff leather; Model 25, beechnut brown with darker trimmings and gold striping, upholstery in black leather. Equipment comprises full cape top with storm aprons, gas headlights, oil side and tail lights, horn, pump, full set of wrenches and tire-repair kit. The catalogue price, thus equipped, is \$2,000 for Model 24 and \$2,500 for Model 25.



TRANSMISSION OF MODEL 25, WITH COVER REMOVED.

Model 21, known as the utility car, differs in many respects from the two just described. Its power plant consists of a double-opposed engine with cylinders 5-inch bore by 6-inch stroke, carried under the body. The transmission gear is the planetary type located on an extension of the motor shaft and entirely enclosed. The gear case is attached directly to the crank case, and contains the change-speed gear, fly wheel and multiple disk clutch. An integral unit is thus formed, with three-point suspension, and of such strength and rigidity that no torsion of the motor frame can cause disalignment of the gears or bearings. Final drive is by single chain to rear live axle. Ignition is by jump spark; lubrication is by pressure feed with three sight-feed regulators on the dash, oil being carried from these to both cylinders and to the gear case. The engine is water-cooled, circulation being by thermo siphon, with a flat-tube radiator giving about 10,000 square inches of cooling surface. Lack of accessibility has often been urged against horizontal motors carried under the body. In the Rambler no such difficulty is known; every part is perfectly accessible. The body of the car is absolutely independent of all controlling mechanism and is secured to the chassis by means of two lock hinges on each side of the body and outside the frame. By loosening a hand-nut on two of the locks the entire body may be swung to the opposite side and held there by braces; or, by loosening all four hinges, the body may be entirely removed in less time than is usually required for taking out the floor boards.

Convertible Body.—A strictly new design of the convertible type has been adopted for Model 21. The front seat is divided and the tonneau is very roomy with wide doors opening forward. Used as a two-passenger car, the tonneau is replaced by a torpedo deck, or, if an extended tour is contemplated, the deck may be omitted and the floor used for hampers, camping kit, etc. The suspension is by semi-elliptic front springs and full elliptic rear springs with involute ends and double shackles. Wheels are wood artillery type, 30 inches diameter, with Dunlop universal rims and 4-inch tires. Upholstering and finish are of the highest grade. The standard color is an occidental red-brown, with dark-brown trimmings, striped with a narrow gold line. Upholstering is a red that harmonizes with the body color, and all metal trimmings are highly-polished brass. Equipment comprises two headlights, oil side and tail lights, horn, wrenches, oilers, pump and tire-repair outfit. Price, with tonneau, is \$1,350; with torpedo deck, without tonneau, \$1,250.

Model 17, a runabout with double-opposed engine carried under the body, is the smallest of the Rambler cars, and was fully described in our issue of September 20.

RARITAN BRIDGE TO BE CLOSED AGAIN.

PERTH AMBOY, N. J., Jan. 28.—The new bridge across the Raritan river at Perth Amboy, recently opened to the public, will be closed for three months this spring by order of the War Department, and New York automobilists who have been reaching the New Jersey coast resorts by a route leading over this structure will have to resume the old route, by way of New Brunswick.

Three of the spans of the new bridge will have to be torn out and replaced with spans of steel, in order to have the structure comply with the department regulations. The department contends that the bridge, as it is now, is an obstruction to navigation. It has been decided to close the bridge to traffic on March 1. The old route, leading through Newark, Elizabeth and New Brunswick, makes the trip from the metropolis to the seashore towns about thirty miles longer than by the new way.

New Castle county, Delaware, has asked the legislature to permit it to borrow \$200,000 with which to build substantial permanent roads within its borders.

NEW YORK-BOSTON AUTO SPEEDWAY.

BOSTON, Jan. 28.—Among the petitions for new Legislation filed at the State House just before the time for filing new bills expired, was one drafted by James F. Bacon, a Boston lawyer, which asks permission to incorporate the "New York and Boston Automobile Boulevard," for the use of automobiles, motor cars and general transportation purposes. The proposed capital of the company is \$2,500,000, and it is desired that the route of the boulevard shall be as nearly as possible an air line touching the following Massachusetts towns and cities: Newton, Brookline, Needham, Dedham, Dover, Medfield, Sherburne, Millis, Medway, Bellingham, Milford, Mendon, Blackstone, Uxbridge, Douglas and Northbridge.

This scheme is supposed to be a part of the general plan for a through line, and the route probably will connect with that proposed by a similar company to be organized in Connecticut, and which will petition the Legislature in that State for similar privileges. It is understood that the promoters of the scheme desire in effect two broad roadways, one for cars going east and the other for cars going west. It will be a toll road, with fees for its use, and entrances every few miles its entire length. The provision in the Massachusetts bill under which the road may be used for "general transportation purposes" is looked upon with some suspicion, as it is feared that under that clause the company might acquire a valuable right of way and use it for a railroad.

Charter Also Applied for in Connecticut.

HARTFORD, CONN., Jan. 28.—Notice of an intention to file a petition to the general assembly of this State for permission to construct an automobile speedway across the State of Connecticut has been filed with the Secretary of State. The signers of the notice are Col. George Pope, A. L. Pope, W. C. Walker, and Charles E. Walker, of the Pope Manufacturing Company, of Hartford, and E. L. Ropkins, of Hartford. The incorporation which will present this petition is to be known as the Connecticut Automobile Parkway Corporation.

When seen by a representative of THE AUTOMOBILE, Col. Pope stated that the proposed incorporators do not contemplate anything but the construction of an automobile speedway. Politicians are inclined to believe that the proposed corporation intends to secure a charter and then lay trolley or railroad tracks side of the auto speedway in competition to the New Haven road, which has long enjoyed a monopoly in the State. Col. Pope states that the corporation will be nominally capitalized at \$100,000. If a charter is secured, work on the path will be started next spring or summer, but it will take several years to complete it.

It is proposed to connect New York and Boston, and the route for the most part will be by private right of way. It is also proposed to run cars at a faster speed than the laws permit on public highways, and to charge tolls to pay interest on the investment and maintain the route. The petition also asks for authority to exercise the right of eminent domain, which gives it the right to condemn and take private land for the construction of the proposed parkway.

SIXTY-MILE AUTO HIGHWAY PROPOSED.

Joining the Bronx concourse and the proposed Catskill Aqueduct automobile highway, so as to make a continuous boulevard sixty miles long from Manhattan borough, New York City, through the Bronx to the Hudson river near Poughkeepsie, is now being discussed by residents of the Bronx. The highway for automobilists would start from the Hillview reservoir, and the concourse, for all vehicles, which is to run from Central Bridge to Mosholu Parkway, could easily be connected with the suburban motor highway. The president of Bronx borough, Louis F. Haffen, is greatly interested in the movement to connect the two systems, and is advocating the plan in conjunction with a number of leading citizens.



ONE of the latest additions to the ranks of popular-priced cars, for which the demand is so large, hails from the middle west. It is called the Kisselkar, and its home is at Hartford, Wis., thus adding another to the growing list of western towns that include automobile manufacturing among their industries. It made its debut at the opening of the year and, unless the plans of its sponsors miscarry, it should prove a factor in the trade before the season is well under way. Instead of attempting to place something of a revolutionary nature on the market, its builders have profited by the combined experience of the many designers who have preceded them and have taken heed to avoid the latter's mistakes, so that far from being something in the nature of an "inventor's pet," the newcomer represents as close an approach as possible to what is regarded as standard engineering practice for cars of this size.

Motor.—This follows universal practice in that it is of the four-cylinder vertical type, designed to be placed forward on the chassis under the bonnet. The cylinders are cast in pairs with the waterjackets integral, both the intake and exhaust valves being grouped on the same side. The direct or push-rod type of operation is employed, both valves being mechanically operated and both being interchangeable, beside being very accessible for removal in case of repair. The valves have been given a liberal diameter, thus permitting of a short lift which makes for a highly efficient engine at all speeds, as it insures rapid filling and emptying of the combustion chamber, as well as a very silent-running engine. The connecting rods are drop forgings of high-grade steel, both the big end bearings and the main bearings being of Parson's white bronze, which is very highly regarded for automobile engine work. The single camshaft is completely inclosed and lubricated from the inside in accordance with the latest trend of design in this respect.

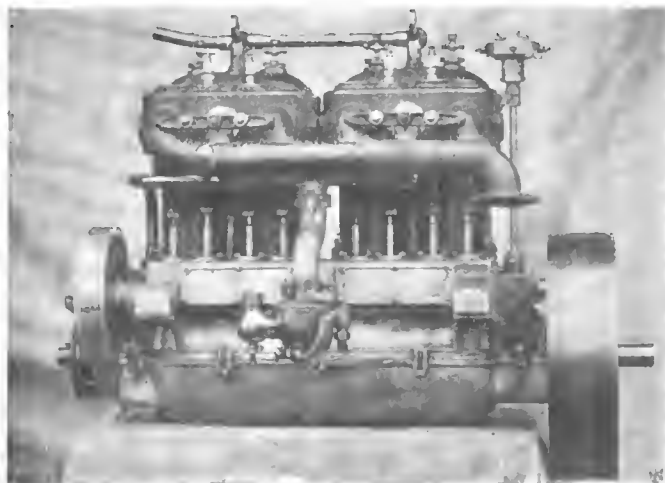
Lubrication.—This essential is well provided for in the shape of a mechanical force-feed oiler driven from the motor and with a number of different leads, feeding directly

to the lower edges of the pistons in each cylinder and the front and rear main bearings, the surplus draining into the crankcase, where a constant level is maintained to provide for splash lubrication. Partitions are provided in the crankcase to prevent flooding either end of it with oil when traveling up or down grades. The crankcase is divided horizontally, the lower half being merely an oil pan or reservoir, so that its removal renders all the moving parts of the motor readily accessible with very little trouble. Considerable attention has been given to this where every part of the motor is concerned so that inspection and removal of parts is made easy. The motor is designed to run at speeds varying within a wide range, but develops its normal rating of 30 horsepower at 1,200 r. p. m., at which it is very quiet in operation.

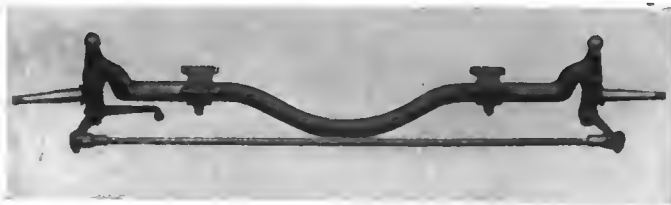
Carbureter.—This is of the well-known Schebler make, with vertical air inlet, and is placed on the left-hand side of the motor quite low down, the inlet manifold being horizontal and fastened directly to the cylinders at the level of the inlet valves. It terminates in a perpendicular downward pointing outlet which is coupled to a special offset with a flanged coupling, bringing the carbureter almost down to the level of the dividing line of the crankcase. The cold water inlet of the circulating system is placed immediately beneath the inlet manifold, so that, as the photo of this side of the motor shows, all the piping necessary is confined to a very small space and is very accessible. The hot water outlet

from the jackets rises from the center of the top of each pair of cylinders, circulation being maintained by means of a gear-driven pump.

Ignition.—The high-tension system of ignition is employed, a set of accumulators being used as the source of current supply. The timer is mounted on a vertical shaft bevel gear-driven from the camshaft. It is placed at the rear of the motor, and is about on a level with the highest portions of the motor, thus making it very accessible and reducing the amount of wire necessary for primary connections. The plugs are situated over the inlet



HOW THE WORKING SIDE OF KISSELKAR MOTOR LOOKS.



THE FRONT AXLE OF THE KISSELKAR COMPLETE.

valves, which brings them close together on each pair of cylinders and also serves to reduce the amount of wiring necessary on the secondary side of the ignition system.

Transmission.—The change-speed gear is of the sliding type, providing three speeds forward and reverse, the method of operation being the selective, which has met with unusual favor at the hands of designers during the past year or so and is now a feature of a great many cars of all powers. The gears have been designed with very large faces, the teeth being cut so as to permit of a very easy entrance, thus avoiding clashing. They are made of high grade steel, specially hardened and ground to size. Both shafts of the change speed gear run on Timken roller bearings. The rear axle is of the floating type, clutch driven, a spur gear differential being employed. This can be readily removed without the necessity of dismantling the axle, by simply removing the cap of the gear case, which exposes the entire differential and bevel driving gears to view. Timken roller bearings are used throughout this part of the car, two of large size being placed on the pinion shaft, with centers 5 1-2 inches apart, thus insuring absolute alignment at all times. As shown by the illustration of the rear axle driving unit, an unusually large torsion rod is used. It runs parallel with the propeller shaft, and is hung at its forward end immediately back of the change speed gear box, thus preventing any distortion of the propeller shaft. The latter is equipped with a large universal joint at its forward end, in order to prevent its binding from the twisting strains of the car caused by traveling over uneven roads.

Brakes.—As has come to be the almost universal trend of modern practice where this highly essential part of the car is concerned, both sets of brakes have been concentrated on the rear wheels. They are housed in a specially designed drum, the external brake, which is interconnected with the clutch, being operated by the pedal for ordinary running service, while the emergency brake is of the internal expanding type, and is also interconnected with the clutch, thus making it impossible to apply the brake in either case with the power of the motor still being transmitted to the driving wheels. By removing a single small bolt, either the running or the emergency brake may be readily disconnected from the clutch, allowing it to work entirely independent of the latter. In addition to the transmission and the rear axle Timken roller bearings are also employed in the front and rear wheels. A liberal size bearing has been provided in every instance, so that the makers fully



REAR AXLE SHOWING ITS KINDRED APPLIANCES.

guarantee them for two years, and will replace them with new ones should they break or wear out within that time. The foundation of the chassis consists of the standard type of channel section pressed steel frame, the axles being spaced to give a 98-inch wheelbase, the running gear consisting of 32-inch wheels shod with 4-inch tires. The Marsh quick-detachable rim is furnished as a part of the standard equipment, this rim permitting of the employment of the Diamond quick-detachable tire or any standard make of clincher tire. With the usual touring body the car comfortably seats five people, and when equipped with side lamps, horn, set of tools, storage battery, tire repair outfit and pump, it lists at \$1,850. The car can also be bought with complete equipment, consisting of a side arm Pantasote top, acetylene headlights, Prest-O-Lite tank, tail lamp and Warner speedometer, with which it lists at \$2,100.

A ROUTE TO THE JAMESTOWN EXPOSITION.

"White Route Book No. 2," just issued by the touring bureau of the White Company, New York, covers a wide sweep of country that is just now receiving a great deal of attention from automobile tourists. In brief, it gives the most popular—and, in fact, the only practicable—pleasure route for automobiles between the Northern cities and the Jamestown Exposition. The running directions in Route Book No. 2 start from New York across Staten Island, and take the usual route from Perth Amboy to Trenton and Philadelphia. Two practicable routes are outlined from Philadelphia to Gettysburg; one via Lancaster and York, the other via Lancaster, Mount Joy and Harrisburg, these two coming together at Gettysburg.

From this point the run is made from Gettysburg through Waynesboro, Pa., to Hagerstown, Md., and Winchester, Va. Here the route through the famous Shenandoah Valley is taken up and followed to Staunton, where the Valley Road is left for a nearly direct line south-and-east across Virginia, through Charlottesville, Richmond and Petersburg, to Norfolk.

From Hagerstown through the Shenandoah Valley, and all the way to Norfolk, this route is identical so far as the country covered and the points passed through are concerned, with the corresponding trip made by Augustus Post last summer, under the auspices of the Jamestown Exposition authorities and the auspices of the Richmond Automobile Club.

The style of compilation in the two routes varies somewhat, but the White booklet has the advantage of various small photographs, illustrating the important points along the route; it also has a general map, which gives an excellent idea of the route all the way from New York and Philadelphia to the end. It is an enterprising piece of work, and deserves the wide circulation that will undoubtedly be had for it.

PROSPECTS OF THE PENNA. STATE HIGHWAY.

PHILADELPHIA, Jan. 28.—The many advocates of a trans-state highway among the automobiling element here were somewhat taken aback at the announcement that State Senator Blewitt, of Lackawanna county, would introduce a resolution in the Legislature asking for a survey by the State Department of Highways of a route for a 32-foot-wide macadam boulevard from Easton to Pittsburg via Sunbury, with branches to Scranton and this city. They greatly fear that the division of sentiment between that route and the one generally accepted—via Lancaster, Gettysburg, Bedford, Greensburg, etc.—may result in a knockout for both. The latter, besides being the shorter, has fewer physical difficulties in its way, and could be constructed for considerably less money. Certain it is that the solons now in session at Harrisburg will not listen to a double route across the State, and there is reason to fear that the legislators will adopt the usual compromise of killing both as a sure method of side-stepping possible antagonism. Under the circumstances the prospects for the highway are far from encouraging at the present session.



BY
FRANCIS MILTOUN

(Continued from last week.)

SO much for the hotels of the large towns: they can't give you for a moment anything like the good cheer and the good feelings which possess you after you have been a guest of the Hôtel de la Poste at Tournon, the Hôtel de France at St. Girons in the Haute Pyrenées, the Hôtel Lieutaud Cassis in the Var, or the Hôtel du Bon Laboureur at Chateaudun, where at any or all of these you are launched at once in the midst of a locally characteristic atmosphere with the *patron-chef* cooking your dinner for you and his buxom wife running the cash box in that strictly personal way which forms one of the great and intimate charms of French travel.

It is in such hotels as these that one gets a genuine warm welcome and a hearty hand-shake on leaving, the personnel meanwhile not hanging about cadging for sous, even though the *bonne* has brought you innumerable jugs of *eau chaude*, and the *marmiton* and *garçon-de-remise* has fussed around with you and the machine while you were filling up with essence, oil and water. No, you give what you like, four sous here, fifty centimes there, and five sous there, and everybody satisfied.

It is in such hotels as these that one finds a mixed company of petty bourgeois, good, honest and simple folk all, and very exacting nevertheless with regard to their food and its cooking. When madame puts her head through the door of the café and says, "Allons, messieurs, à table," you file in and take your places ensemble; an army officer or two, perhaps an abbé, a local lawyer and his client, and three or four *commis-voyageurs*; very, very seldom any women folk.

Just recall the succulent *soupe aux choux*, the delicious *friture* (the little fish from the river just before the door), the inevitable *ragout* of something or other—wasn't it good? and the *rôti*, a duckling perhaps or a *pintard*, with a crisp salad with just a suspicion of garlic in the dressing (sometimes a trifle more), and a dish of *petits pois au naturel* (not the green, coppery kind specially put up for the English and American markets). Then there was the wine, a *vin de l'ouray*, perhaps, if in Touraine, or a *vin de St. Peray*, if on the banks of the Rhône; just ordinary *vin de table*, but *il n'était pas mal*.

A pointer, then, for stranger tourists en automobile in France: stop at some small town for déjeuner, or dinner, and the night instead of in the large towns, and get a taste of the real *cuisine du pays*, a rare, succulent thing which knows not "Liebig," aluminum and electric cooking utensils, or unpronounceable Russian names for the plats; stop at Tournon instead of Lyons, at Cassis instead of Toulon, at Blaye instead of Bordeaux, and at Les Andelys instead of Rouen.

The same thing applies all over France. Pick your hotel from the Guide-Michelin or the Annuaire of the Touring Club de France or the Automobile Club de France, and not from Baedeker or Murray. Another thing, if you travel with Baedeker as a guide, supplement it with Joanne, in French. Even if you don't read French it will be of untold value from an automobilist's point of view. For proof of this just compare Joanne's Normandie with Baedeker's Northern France and see what you gain with the former as to maps and plans and hints on the serious business of travel in that delectable province of old France.

A frowsy little hotel off the beaten track, with nothing of the Ritz-cum-Carleton about it, will leave a far better memory of its simple characteristic fare than the imitation Escoffier and Brillat-Savarin *plats* of the de luxe hotels, which in France, even, are the same dishes as in de luxe hotels elsewhere.

As for hotel prices, the whole continent of Europe is much cheaper, and the fare is much better, than one gets in England. It is not snobbery to decry the English resorts and say how much one prefers Ostend to Brighton, St. Jean-de-luz to Bournemouth, or Marienbad to Buxton; there is a difference—a wide difference—which need not be specialized.

It is by the mark to abuse English cookery; the grill is one of the sanest and most healthful forms of cookery extant, and the roast beef in England is proverbially good—when it is roast beef and not baked meat, and when it is not horribly hacked and butchered in the serving. All the same the hotel meals of England, even in the best of the resorts, are dreary, sad affairs with impossibly cooked French *plats* and a generous sprinkling of plain boiled as well. To take one item alone, a roast chicken, it is only in France that one can get a decent *poulet rôti*.

One thing to bear in mind, however, that the "resort" hotels the world over are perforce expensive and do not differ greatly—so far as the premier establishments go—and whether one is in the Engadine or on the Cote d'Azur, the Cote d'Argent, or the the Cote d'Emeraud: the final tinge is golden and of a rich hue. Closely allied with the hotel which caters for the wants of the automobile traveler are the establishments which can render a service to one's automobile as well—the repair man or *mécanicien*, as the Frenchman knows him.

The garage accommodations of the hotels themselves, the



ONE FINDS THE MECHANICIAN ALL OVER FRANCE.



LES ANDELYS

CHAMPTOCEAUX

ORLEANS.

THREE KINDS OF HOTEL GARAGES IN FRANCE.

actual storage places for your automobile for the night, are nearly everywhere all sufficient, and in some cases palatial, as at the Hotel de l'Univers at Tours, the Grand Monarque at Chartres, or in most of the large towns, such as Arles, Nimes or Avignon, at Remis, Bourges or Rouen. In the smaller towns one very often has to house the machine in an old stable, perhaps sharing it with the hotel omnibus, but in almost every instance some special effort has been made towards furnishing proper accommodation, so far as freedom from danger and a safe, dry place for storing one's machine is concerned. This is a good deal and more than you get in England, and in France you furthermore pay nothing for this accommodation. Remarkable this, many will think, but a very astute and intelligent move on the part of the French hotel keeper who would cultivate a new clientèle rather than drive it away, as more than one hotel proprietor in England is doing to-day. One does not think it a fair proposition to be charged a shilling or eighteen pence for leaving his machine in the uncovered courtyard of a hotel while he and his three companions are spending a guinea on a lunch.

The repair man, or *mécanicien*, even with the best regulated automobile families, is a necessity at times, and at other times a great accommodation. Your carbureter may have to come down—for a good and sufficient reason which you know well enough—and you had much rather someone else would do the job than bother with it yourself. A drop of solder on the *flotteur* is all that is needed, but it's an hour's dirty work getting at it and putting it back in place again. This will probably cost you a franc and a half (say thirty cents), and is not dear at the price.

You may have stripped a thread on a bolt and it is desirable to have another to replace it immediately. Your French *mécanicien* sizes up the situation in a moment and sees that you have an English or an American machine—and the threads are not metric. He doesn't attempt to do a "gas-pipe job," as do most of his brethren in England, but takes the bolt out bodily and turns down, perhaps, a large French bolt to the proper size, with its nut and thread all made, puts it in place and off you go at a cost of—well, a mere nothing. If this procedure is not wholly practicable, he will even turn you a nut with a "Whitworth," a "Standard," or any other thread (and he will do it on an American lathe, too—which he calls a *tour*). This is an art. One thinks almost as great an art as that which accomplishes the multifarious operations of the watchmaker, and

it takes a fair bit of time, but it won't cost you over a dollar and probably not that. Yes, the *mécaniciens* of France are a rare race of workmen. This is another of the pleasures of touring in France.

American Automobiles on the Roads of France.

Nowadays one sees not a few American automobiles on the roads of France. In a journey of last summer from a little Breton fishing village to another unspoiled little town near Marseilles, a little Oldsmobile was met gliding gently along a great tree-bordered *route nationale* in the midst of the plain of La Beauce; and within half a day a fifty-horse Thomas, and on the road by the Rhône, below Valence, a Pope-Toledo, and again a Pierce. It is the Americans, of all stranger automobile tourists, who are most frequently seen in France.

It was unquestionably remarkable that four American automobiles should be seen in succession, on such a cross-country run as this, but such is the fact, and it is the more remarkable because for one whole day, while skirting the "Massif-Centrale" (that volcanic region around Le Puy and Clermont-Ferrand) and the mountains of the Vivarais, not a mechanically propelled vehicle of any kind was seen, except a motor-omnibus of Lyons manufacture being "tried out" as to its fitness of the work that it was intended to perform. They had chosen a likely spot for the trial, for it was on an eighteen kilometer "hill" just outside of Roanne in the Haute Loire.

That night we slept at Lyons, at the Hotel de l'Univers et de l'Automobilisme, and paid our bill the next morning with every content as to accommodations and price, though there was added to the bill ten per cent. in lieu of *pourboires*. This was a novelty and it seemed to work well. Everybody satisfied: clients, servants and proprietor. But it must have taken a lot of nerve for the proprietor to cut loose from established custom.



PHASES OF BUSY AUTOMOBILE CLUB LIFE

A. C. of California Urges Careful Observance of Law.

SAN FRANCISCO, Jan. 22.—As a sample of the sensible work the executive committee of the Automobile Club of California is doing to popularize automobiling in this State, and ward off restrictive legislation, the following letter, recently sent out to automobile dealers in the State, stands out pre-eminent. The letter is given in full, and is worth careful consideration:

"As you are aware, frequent automobile runs have been made between San Francisco and Los Angeles, with the view of establishing so-called 'records.' While these runs have sometimes been made by privately owned cars, they have always been instigated and managed by dealers, with a view to advertising some particular make of machine, and thus furthering personal interests only. You cannot be unmindful of the fact that almost any of the present makes of machines, and certainly all of the goodly number of the best of them, are capable of making the average speed necessary to equal any 'record' possible under highway conditions, such a 'record' being merely a matter of skillful operation coupled with a fair amount of good fortune against ordinary roadway troubles. Such runs prove nothing else.

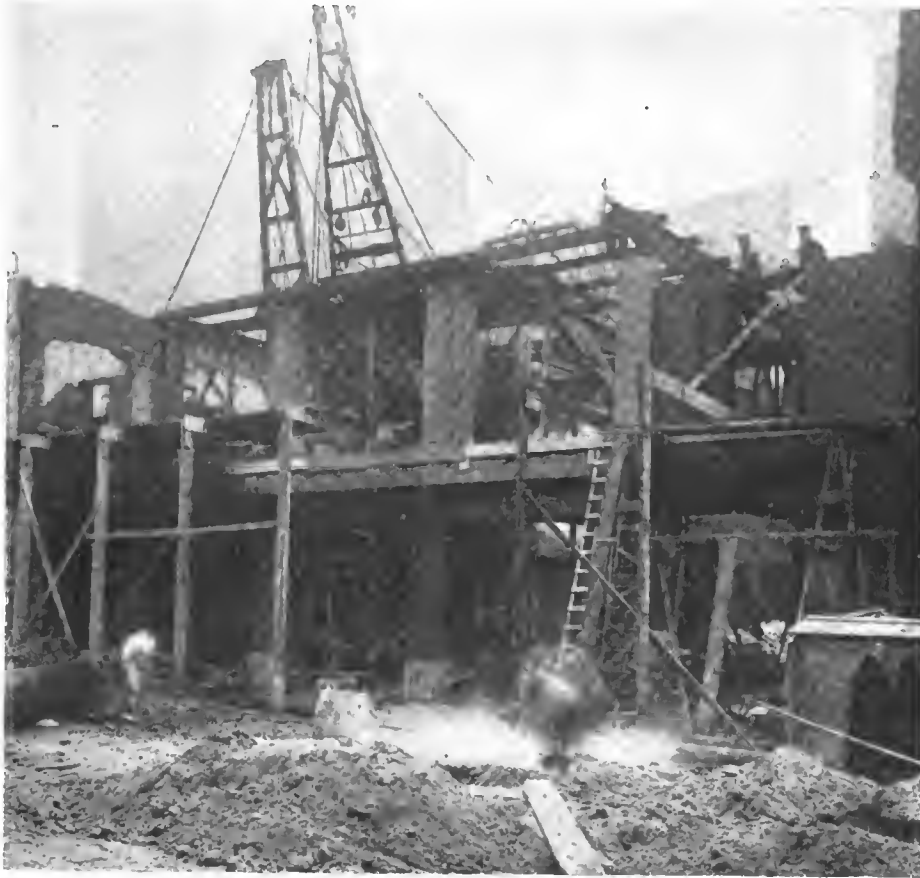
"In thus attempting to further purely selfish ends, participants in these runs willfully violate the State law applying to the use of the highways by automobiles, endanger the lives and property of highway users in general, and bring discredit and odium upon all automobile owners and users. It was through the efforts of the officers of this club that our present highway law was passed, and it is therefore felt to be incumbent upon the club to attempt to enforce the spirit of the law at least, and with that object in view a letter has been addressed to the Boards of Supervisors and the District Attorneys of several of the counties of the State, a copy of which is enclosed for your complete information. No class can be more interested in the continuance of our present law, or one having no greater restrictive measures, than automobile dealers, as large sales of cars depend greatly upon the purchasers' ability to freely use them without too restrictive conditions, and it would therefore seem dealers should be first and foremost in advocating the legal and rational, and not criminal, use of public thoroughfares."

As a general thing the public commends the club's action,

Spring Endurance Run Interests Central Penna. Autoists.

YORK, PA., Jan. 28.—At a meeting of the York County Automobile Association, held the other day, it was decided to purchase an individual tag to be placed on the cars. The tags will bear the inscription "York County Automobile Association," and the member's individual club number will appear on the tag below the above marking. The proposed State highway between Pittsburg and Philadelphia was also discussed by the members, and they are heartily in favor of such an improvement being made to the big auto road. Quite a few new members were admitted at the last meeting.

This city will be the chief checking station in the endurance run to be held April 8 and 9 by automobilists from this part of the State. The run will leave Harrisburg on the morning of April 8, and will proceed to Hummelst, Palmyra, and Annville to Lebanon, the first checking station. From Lebanon the cars proceed to Manheim, Lancaster, Marietta, Columbia, and then to this city. The night's stop will be made in York. The second day's run will take in Hanover, New Oxford, Gettysburg, Chambersburg, Shippensburg, Newville, Carlisle, Mechanicsburg, and thence to Harrisburg, where the final checking will be made. Two valuable trophy cups have been offered to the winners in the touring car and runabout classes. Many local tourists will



HOW THE CHICAGO AUTOMOBILE CLUB HOUSE LOOKED JANUARY 15.

The open winter has benefited the builders of the new palatial home of the Chicago Automobile Club, and the third story is now in progress. The illustration is from the official club "Journal."

compete in the run, and from present indications no less than twenty-five cars will be sent away from the Capital City on the morning of April 8, and probably twice that number.

Smoky City Autoists Plan a Busy Season.

PITTSBURG, PA., Jan. 28.—The Automobile Club of Pittsburg is taking on new life. Interest in the Pennsylvania Motor Federation has aroused new popularity for the Pittsburg organization, and its officers are now planning a series of events which will make the club a busy organization the coming season. The officers of the club, in conjunction with the Automobile Dealers' Association, have arranged for a series of lectures by experts from the various factories on the engines and parts of the different cars most used in Pittsburg. Endurance contests and road runs are also being planned for the spring and summer, and it is

proposed to extend the good roads campaign as fast as possible. At the last meeting of the club these officers were nominated to be voted on at the annual election February 18: President, George E. Turner, William N. Murray, Edward Kneeland; first vice-president, Phillip S. Flinn, George E. Painter; second vice-president, William N. Murray, E. J. Kent; third vice-president, Frederick Byers, W. A. Heyl; secretary, Paul C. Wolff; treasurer, George G. Glass; governors of the club, five to be chosen, Dr. J. A. Hawkins, Phillip S. Flinn, George E. Turner, William P. Baum, John C. Bragdon, C. M. Miller and William L. Dixon.

Capital City's Club Inaugurates Series of Smokers.

WASHINGTON, D. C., Jan. 28.—The spacious clubhouse of the Automobile Club of Washington was thronged with members and guests on the night of January 24, when the first of a series of smokers was given. More than two hundred cars were parked in front of the club house during the evening. President Caverly, Secretary Mark and Frank C. Berens had charge of the arrangements, and they carried out the details in a manner that won them much praise. During the evening a vaudeville entertainment was provided, several members of theatrical companies playing in Washington furnishing the bulk of the "stunts." A lot of new motion pictures of decided interest were also displayed. A buffet supper was served in the upper rooms.

Members of the Automobile Club of Washington are greatly interested in the proposed efforts of the District Commissioners to secure the enactment of a police regulation requiring all vehicles, whether used for business or pleasure purposes, to carry lights after dark. Some years ago the club made a determined effort to secure this legislation, but such a howl went up that the effort was abandoned. It is pointed out that many accidents occur on account of no lights on wagons and carriages after dark, and the commissioners believe that conditions now warrant some action along the line indicated.

Charleston Autoists Will Form a Club.

CHARLESTON, S. C., Jan. 25.—This city is about to have an automobile club, preliminary steps to organization having been taken at meeting just held at the rooms of the Commercial Club. A committee of five, consisting of J. M. Connelley, Norman H. Blich, E. W. Hughes, Dr. R. S. Cathcart, and M. B. Paine, was appointed to draft a constitution and set of by-laws, and prepare a plan for permanent organization which will be consummated at a meeting to be called in the near future.

Philadelphians Hear Lecture on Carbureters.

PHILADELPHIA, Jan. 28.—Over 150 members of the Automobile Club of Philadelphia gathered at the club house, 1409 Walnut street, last Saturday night to listen to a lecture on "Carbureters," by Prof. Charles E. Lucke, of Columbia University. After the lecture there was a short discussion of the merits of alcohol as a fuel and the best form of carbureter to use therewith. A banquet wound up the evening's entertainment.

CLUB DOINGS IN GENERAL.

WILKINSBURG, PA.—The Wilkesburg Automobile Club has joined the Pennsylvania Motor Federation.

WILMINGTON, DEL.—After a long lapse of inactivity the Wilmington Automobile Association has met and discussed plans for the coming season. There was no significant action taken at the meeting, but renewed activity is expected.

PHILADELPHIA.—The Automobile Club of Germantown will hold its annual dinner Friday evening, February 9. Robert P.

Hooper, chairman of the Highway Improvement Committee of the A. A. A., heads the club's guest committee, and will act as host for the occasion.

BROOKLYN, N. Y.—A. R. Pardington, chairman of the good roads committee of the Long Island Automobile Club, has chosen as fellow committee members H. S. Fullerton and Alexander Schwalbach, and the appointments have been confirmed by President Richardson.

LOS ANGELES, CAL.—Good work has been accomplished by the Automobile Club of Southern California this winter. The road to Santa Barbara from this city has been adequately equipped with enameled danger and guide signs, and the inland San Diego road has had a large number of the signs put into position.

YOUNGSTOWN, O.—Plans are being made by automobilists of Youngstown and Marietta to organize auto clubs in both cities. A. D. Thomas, of Youngstown, and L. L. Peddington, of Marietta, recently visited Cleveland, for a consultation with Secretary Asa Goddard, of the Cleveland Automobile Club, and both prospective organizations will accept the Cleveland club as a model.

NEW YORK.—At the last meeting of the board of directors of the New York Motor Club it was decided to place in operation initiation fee clause of the by-laws commencing March 1. A committee was appointed to arrange changes in the by-laws of the club, intended to simplify the executive work of the organization and at the same time widen its power for activity in many lines, such as legislation, good roads, contests, tours, etc. It is probable that the number of directors will be increased from nine to fifteen. A. G. Batchelder was elected first vice-president of the club, and will represent it on the governing board of the New York State Automobile Association. President Stevens has been named on the directorate of the A. A. A.

FIRST YEAR OF THE JERSEY LAW.

TRENTON, N. J., Jan. 28.—J. B. R. Smith, commissioner of motor vehicles for New Jersey, has submitted to Governor Stokes his report of the workings of his department since its creation under the Frelinghuysen law of last winter. One of the most perplexing questions with which the department has had to deal is the proper identification of vehicles. The report says that the ideal identification would consist of some device that can be plainly seen under any conditions of light or darkness from any reasonable distance or angle. Interstate registration has received attention, the proposition being made that each State accept the identification marks of the others, as, for example, a car registered in Pennsylvania with the mark 5000 Pa. would be given the same number in New Jersey and other States agreeing to the proposition. On the personal examination question the department finds a wide difference of opinion. It concludes that the personal examination accomplishes no good purpose, and might be superseded by an age limit, a declaration that the applicant is physically and mechanically competent to drive, and that he is acquainted with the automobile laws of the State. Contrary views also prevail on the speed limit, Commissioner Smith having a decided leaning towards a general proviso which prohibits any person driving a motor vehicle at a greater speed than is reasonable, having regard for the traffic and use of highways. Neither is the commissioner in sympathy with the suggested maximum gears, believing that the ease with which any gears can be altered would make it impractical from a mechanical viewpoint. Other suggestions are compulsory lights for all road vehicles; the trial of automobile offenders before a Court of Common Pleas, or some special court; provision for appeals in the matter of revocation of licenses and registration certificates; and more uniform and united action among the different police forces.

BELGIUM OPENS ITS NATIONAL SHOW.

BRUSSELS, Jan. 20.—Surrounded and escorted by staff officers, Prince Albert of Belgium officially opened the national automobile show in the Palais du Cinquantenaire. Being under the direct patronage of the King of Belgium, himself an enthusiastic automobilist, the opening had all the éclat of a Court ceremony: grenadier guards in full dress uniform, staff officers, members of the Government, industrious little Belgium's leaders of industry, in regulation dress suit, and not a small number of fair dames made up a brilliant group. Prince Albert has more than a smattering of automobile knowledge, and in his three hours' ramble through the big palace showed a deep interest in the leading national models. As an indication of the Prince's automobile enthusiasm it is interesting to recall that ten or twelve years ago he bought the first De Dion gasoline tri-car which ever appeared in Belgium; the machine had as strenuous a life as ever a De Dion knew.

Minute attention has been paid to the decoration and illumination of the hall, the effect being pleasing, notwithstanding that ten thousand of the 32,000 electric lamps refused to light up on the opening day. In very many cases French exhibitors have transported their handsome Paris stands to the Brussels exhibit, a fact which is very gratifying to the Belgian public.

Belgium constructors predominate, naturally, but French builders are present in large numbers; Germany and Italy are adequately represented; other countries have only one or two firms each. The home industry gives signs of rapid progress during the past year, the industrial motor especially receiving an enormous amount of attention at the hands of both builders and users. In general the Belgian automobile industry has followed very closely in the wake of France; but in the matter of light and heavy delivery vehicles the little royalty early forged ahead of its republican neighbor, and still maintains her lead.

Considerable attention is being given to the automobile for army purposes, and a delegation of staff officers will follow and report on the heavy vehicle competition to be held next April.

EARLY ENTRIES MADE FOR GRAND PRIX.

PARIS, Jan. 19.—Contrary to previous experience, entries for the Grand Prix race, to be held in June or July next, are being made early by French constructors. Already \$19,000 have been handed over to the sporting commission as entrance fees for three Bayard-Clement, three Darracq, three Motobloc, and one Corre, three Panhard-Levassor, three Lorraine-Dietrich, and three Renault machines. Of these the Motobloc and Corre are the only firms which have not figured in previous important long-distance road races. The Motobloc racers will have all the distinctive features of the firm's standard touring machines, will not develop more than 100 horsepower and will not weigh more than 2,200 pounds. It is expected that three Brasier, three Hotchkiss and two Civelli de Bosch machines will shortly be engaged, bringing up the French competitors to twenty-seven. Foreign firms have not yet shown themselves interested in the race, but Mercedes, Fiat, Itala, Rolls-Royce (British) and Germain (Belgian) are regarded by the club officials as almost certain starters. Thus the total number of competitors will be from thirty to thirty-five. No decision has yet been arrived at regarding the exact date of the race or the circuit on which it will be run. From some twenty or thirty, the list of suitable circuits has been cut down to four, each of which is being enthusiastically boomed by its not uninterested partisans. At present the Seine-Inférieure course is in the ascendency. Starting from Dieppe it follows the coast line to near Mers, descends south to Londinières, and runs up to Dieppe again, forming an equilateral triangle of about fifty miles. Its rivals are the Eure, Marne, and Aisne districts, each with courses averaging 55 miles. With a possibility of thirty entries for Grand Prix No. 1, and twice that number for Grand Prix No. 2, an exceptionally wide circuit is essential. The members of the Sporting Commission find a choice very difficult.

Although official regulations are not yet out, three Gillet-Forest machines have been entered for Grand Prix No. 2. This event will be run the day after Grand Prix No. 1 on a fuel allowance of 3.3 gallons per 62.1 miles.



IMPOSING VIEW OF THE BRUSSELS AUTO SHOW FROM ONE OF THE END GALLERIES OF THE PALAIS DU CINQUANTENAIRE.



ACROSS THE RIO GRANDE INTO MEXICO, LAREDO, TEXAS.

IN MEXICO WITH MR. GLIDDEN.

After 5,022 miles of safe and enjoyable travel since November 1, the date of departure from Boston, Globe Girdler Charles J. Glidden's Mexican trip came to a sudden stop December 31, when within fifty miles of the ancient city of the Aztec kings. After leaving Chicago, on November 22, Mr. Glidden and party used the railway tracks, his Napier car being fitted with special wheels with flanges, and his auto had the same status with the railroads over which he passed as a special train. He passed the Mexican border over the railway bridge at Laredo, Texas, and continued his journey southward toward the City of Mexico, which he figured would be reached the day before New Year's.

The story of the wreck of the car is best told in Mr. Glidden's own words: "We were running twenty-eight miles an hour," he says, "on a straight track, when a rock wedged in between the main track and a guard rail was struck by the flanges of the left wheels, and we jumped the rails and ran about ninety feet. The forward wheels collapsed and we were all spilled out, but no one was injured. Had not the wheels collapsed the car would have run up on a bank, overturned, and undoubtedly buried us all underneath, with serious results. I tapped the telegraph wire, put on a set of instruments that I was carrying, and immediately opened up communication with the train dispatcher at Mexico City, securing assistance in a short time in the shape of a special train. We arrived in the City of Mexico on the time planned, December 31."

Mr. and Mrs. Glidden have returned to Boston, and will continue their world's tour upon the completion of repairs to the



ONE TYPE OF MEXICAN HOME THAT IS FREQUENT.

car, which has been shipped to the Napier factory in England. They will resume their journey at Port Said, in Egypt, to which point, at the entrance of the Suez canal, the car will be sent when repairs have been made.

PENNSYLVANIA AUTOISTS ARE HOPEFUL.

HARRISBURG, PA., Jan. 28.—Improvements in automobile legislation are being sought by the Pennsylvania Motor Federation. The changes contemplated include more elastic speed law regulations, especially in country districts, where the present law is unnecessarily stringent; greater license for automobilists, with a strict accountability for offenses; a reciprocity between automobilists from other States, whereby visitors will not be required to take out a new license before touring through Pennsylvania, providing the State from which he comes extends the same privilege to Pennsylvania. State Highway Commissioner Hunter has included these proposals in his annual report to the State Legislature.

A BILL TO TAX AUTOS IN CONNECTICUT.

HARTFORD, CONN., Jan. 28.—A bill to tax automobiles annually \$1 per horsepower was introduced last week in the senate of the general assembly. This will apply only to cars registered in the State of Connecticut. The bill has been referred to the committee on rivers, roads and bridges. The proposed taxation measure has the endorsement of the Farmers' Association of the State, which always wields a strong influence in the general assembly, and there is a possibility of it being favorably reported.



9,000 FEET ABOVE SEA LEVEL ON MEXICAN RAILWAY.



WRECK OF GLIDDEN CAR, 50 MILES FROM THE CAPITAL.

THE AUTOMOBILE CALENDAR.

AMERICAN.

Shows.

- Feb. 2-9.....—Chicago Automobile Show, Colliseum and First Regiment Armory. S. A. Miles, manager.
- Feb. 11-16.....—Detroit, Mich., Sixth Annual Automobile Show, Light Guard Armory, Tri-State Automobile and Sporting Goods Ass'n. E. E. McMasters, mgr.
- Feb. 18-23.....—Buffalo. Fifth Annual Automobile Show, Convention Hall. D. H. Lewis, manager, Teck Building.
- Feb. 18-23.....—Cleveland Automobile Show, Cleveland Automobile Trade Association. George Collister, manager.
- Feb. 18-25.....—San Francisco, Golden Gate Park Skating Rink. Automobile Show, Dealers' Association and Automobile Club of California.
- Feb. 25-Mar. 2.—Portland, Me., Second Annual Automobile and Power Boat Show, The Auditorium.
- March 2-9.....—Chicago, Second Annual Power Boat Show, Seventh Regiment Armory. W. C. Andrews, manager, 19 E. Huron St.
- March 2-9.....—Minneapolis, Automobile Show, First Regiment Armory, Minneapolis Automobile Dealers' Ass'n.
- March 4-10.....—Kansas City, Mo., First Annual Automobile Show, Convention Hall. Frank L. Woodward, manager, Willis Wood Theater Building.
- March 9-16.....—Boston Automobile Show, Mechanics' Hall and Horticultural Hall, Boston Automobile Dealers' Association. Chester I. Campbell, manager.
- March 13-16....—Omaha, Auditorium, Second Annual Automobile Show, Omaha Dealers' Association. T. Gillian, manager.
- March 18-23....—Providence (R. I.) Automobile and Power Boat Show, Infantry Hall. F. M. Prescott, manager.
- April 1-6.....—St. Louis, Mo., Automobile Show, Jal Alai Building, St. Louis Automobile Dealers' Association.
- April 6-13.....—Montreal, Canada, Second International Automobile and Sportsman's Exhibition. R. M. Jaffray, manager, 309 W. Notre Dame Street.
- April 8-13.....—Pittsburg, Pa., First Annual Show of the Pittsburg Automobile Dealers' Association, Duquesne Garden.

Race Meets, Hill Climbs, etc.

- May 30.....—Philadelphia, Hill Climb, Quaker City Motor Club.
- Oct. 19.....—St. Louis, Mo., International Aerial Race for the Gordon Bennett Prize. Aero Club of America.

Motor Boat Races.

- June 8.....—670-Mile Ocean Motor Boat Race, New York to Bermuda. Motor Boat Club of America and Royal Bermuda Yacht Club.
- Sept. 2-6.....—Jamestown (Va.) Exposition, Motor Boat Races.

FOREIGN.

Shows.

- Jan. 25-Feb. 2.—Liverpool Motor Show, Tournament Hall.
- Feb. 1-9.....—London, Crystal Palace Motor Show.
- Feb. 16.....—Turin, Italy, Automobile Show.
- March 1-16.....—London, Olympia Commercial Vehicle and Motor Boat Show.
- April 6-13.....—London, Agricultural Hall Motor Show.
- May 4-15.....—Madrid, Spain, Automobile Exhibition, Palace of Fine Arts, Royal Automobile Club of Madrid.
- May 15-26.....—Zurich, Third Annual Swiss Automobile Show.

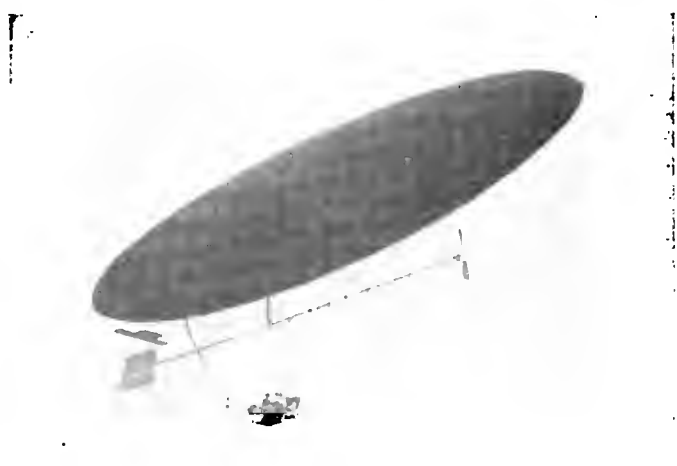
Race Meets, Hill Climbs, etc.

- Feb. 23-27.....—Voiturette Contest, Automobile Club of Italy.
- March 20-27....—Nice (France) Automobile Week.
- April 1-15.....—Spring Wheel Competition.
- April 21.....—Targa Florio Tour (Sicily), Auto Club of Milan.
- April 25-28.....—Touring Contest, Automobile Club of Touraine.
- April 28.....—Chateau Thierry Hill Climb.
- May 24-27.....—Voiturette Contest, Automobile Club of Austria.
- May 29-June 1.—Irish Automobile Club Reliability Trials.
- June 3-12.....—Herkomer Cup, Automobile Club of Bavaria.
- June 14.....—German Emperor's Cup, Taunus Circuit, Imperial Automobile Club.
- June 24-29.....—Scottish Reliability Trial, Scottish Automobile Club.
- June 25-July 8.—Grand Prix, Automobile Club of France. (Exact date to be decided upon.)
- July 14, 1908....—Paris to London Aerial Race.
- Aug. 11-20.....—Coup d'Auvergne, France.
- Aug. 18-22.....—Ardennes Circuit (Belgium) and Coupe de Liedekerke.

PARIS TO LONDON AERIAL RACE.

PARIS, Jan. 20.—Flying machines being the latest things in existence, it was not to be supposed that the enterprising, competition-organizing Parisian journal *Le Matin* would remain indifferent to their development. Paris to London by balloon, for a grand prize in cash of \$50,000, twenty thousand of which were given by *Le Matin*, and \$10,000 each by the Marquis de Dion, M. Clément, of automobile firms, and M. Charley of Mercedes interests, was announced a few months ago. Plenty of time has been taken to study conditions, and it is only to-day that the official regulations have been made known. The big prize will be given to the proprietor of the machine traveling from Paris to London under its own power in the shortest time, where there are several competitors, or in any case within a 24-hour limit. The distance being about 220 miles, a minimum speed of over nine miles an hour will have to be maintained. Mishaps en route appear to be considered possible, for the regulations stipulate that the machine and its pilot must finish together. One finishing without the other will disqualify.

Whatever the weather conditions the first start will be made on July 14, 1908—the French national fête day. If the prize is not won, other starts will be made on the second Sundays in



COUNT DE LA VAULX'S FIRST DIRIGIBLE AIRSHIP.

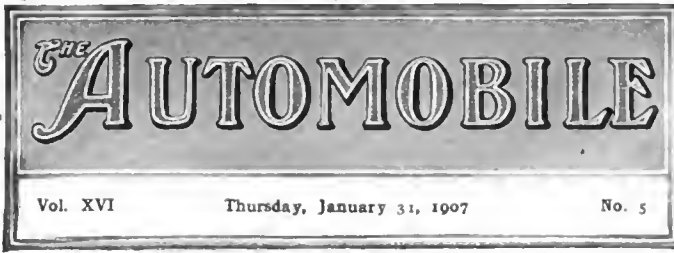
As it appeared when hovering over the Sartrouville Plain, near Paris, on the morning of January 9.

August, September, and October. Descents may be made during the journey for filling gasoline tanks and taking up stores, but no outside propulsion aid must be given the machines. Arrival will be made by dropping a seal within a circle of 82 feet from a fixed point yet to be decided upon in the city of London. Any type of aerial machine is available for entry, but the motor must be of French construction.

RACING BALLOON MAY ENTER DUTY FREE.

Balloons engaged in the Gordon-Bennett International Aeronautic race at St. Louis will, by a decision of the Secretary of the Treasury, under date January 16, 1907, be allowed to enter the United States under bond. This privilege of free entry will be limited to balloons engaged for some race or specific contest, and will not cover exhibitions. A consular invoice must be obtained from the United States consul at the city where the balloons are shipped, and must be presented at the time of entry into the United States. The balloons must be exported from this country within six months from the date of entry.

J. C. McCoy, who will almost certainly be one of the three defenders in the Gordon Bennett balloon race, has been awarded a license as a pilot by the Aero Club. Mr. McCoy had already qualified as a pilot of the Aero Club of France. He is the first aeronaut to make a formal entry for the Lahm cup. A cup will probably be offered this year for women aeronauts.



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Present Status of the Chicago Show. Historically considered, the rise and development of the show idea in the western metropolis is almost a repetition of what it has been in New York. Like the small beginnings that characterized the project in this city, there was a first abortive attempt at holding an automobile show, and in the case of Chicago this was of the open-air variety. It was a fizzle, but it did not discourage the promoter of the first successful show which was held but a year later than the first event of the kind, which occupied the floor at the Madison Square Garden in November, 1900. That was in 1901, at the Coliseum, and as the latter is a structure fully as large, if not larger, than the Garden, there was the same difficulty in piecing out the meagre exhibits to make some kind of a showing that would begin to fill it. With this exception, however, that the imported car had not reached the inland city at that time in anything like the numbers in which it was known in New York, so that there was a dearth of this material for the promoter to draw upon. Those who can recall the first event of the kind to hold forth in the Garden would not be apt to say that there were many imported cars on view, but no matter how small their number, there were some; there were considerably fewer at Chicago, if, indeed, there were any at all. The same expedient of making a track around the board floor on which to permit the cars to perform was resorted to with about the same results. In fact, even after there were more than enough cars and accessories to fill all the available space offered by the Coliseum, the exhibitors of the former were permitted to show them in action in the limited space afforded by their allotment, just to let the buyer know that they would run.

The rest is a matter of common knowledge—how the Chicago show has continued to expand, until in point of space occupied, as well as the total number of exhibitors, it is now superior to any held in this country. And its rise and growth have also been that of the city of Chicago as a market, or, more properly, as a distributing center, for a large part of the automobile output of the country. To a very great portion of the United States Chicago is east and that portion sends a large representation to the annual show, and it draws as well from the south and southwest, even across the border in Mexico. As a market with a large local demand it is second only to New York, as is evidenced by the rapid though sound financial development of its “automobile row,” and as one of the events of the season its show has come to be a matter of importance not alone to the local population but to automobile interests at large. The West demands special attention.



Encouraging Extent of the American Industry.

Statistics usually make dry and uninteresting reading, and the lesson they bear is more often than not forgotten ere it has had time to make any impression; nevertheless, there is nothing that reveals so surely the hand of progress, and for this purpose a complete list of the cars made in this country has been tabulated and is published in this issue. It shows, in condensed form, better than anything else possibly could, not alone the vast extent of the American industry as a whole, but the extremely wide range of types and prices that are offered to the American purchaser. From the diminutive runabout listed at a few hundred dollars up to the car selling at several thousand and upon which no expense nor ingenuity has been spared to make it not alone as modern, but as luxurious as possible, there is a wealth of variety such as seemed far beyond the wildest flights of imagination but a few years ago. Whether it be power, weight, multiplicity of cylinders or the reverse, or merely speed that the buyer sets up as his whole criterion in choosing a car, he will find his wants fulfilled. There are cars having all the way from one to eight cylinders; cars with less than 10 horsepower or with more than 50; cars at almost any weight desired and with any speed range or touring capacity that the most exacting of autoists could call for. To the observer who delves beneath the surface, the most surprising thing of it all and the one which shows better than anything else the firm foundation upon which the American industry is based, is the fact that these cars are built by their makers with few exceptions, and not merely assembled. Though the parts maker who is a specialist must ever be one of the strongest factors in the industry, the day of cars constructed wholly of stock parts of questionable value, cheaply assembled, is fortunately still a long way off. May it remain so.



Auto Sprint Racing Has Had Its Day.

A post-mortem of the Ormond-Daytona meet quickly unearths the fact that sprint racing is a thing of the past in automobile competition. To construct a car practically, capable of lasting not much beyond the mile, is a task of which any automobile manufacturer is capable by simply multiplying cylinders and adding surplus power. Mr. Stanley applied himself to the job, and let us admit that he succeeded in evolving a flying freak, worthless for any other purpose. But the buyer of automobiles to-day demands a car which can go the distance, and, therefore, if he is influenced by racing performances, he now looks to a Grand Prix or Vanderbilt Cup winner, and pays slight heed to a dash performer. If there are to be future meets over the famous Florida course, there must be a commanding event almost equal in importance to a big international road race, and it would appear that those connected with the Ormond-Daytona racing fully realize the situation which confronts them. A late winter or early spring event of the distance variety undoubtedly would be welcomed by those makers who would participate in the Vanderbilt and desire another opportunity for competition with the same cars.

FLORIDA MEET SPOILED BY FREAK SPRINTER

Which Startlingly Concluded Its Career, Nearly Killed Driver Marriott, and Ended Racing—Next Year Distance Events to Occupy Center of Stage and Sprints Secondary.

By. A. G. BATCHELDER.

ORMOND-DAYTONA, FLA., Jan. 26.—A steam freak, which just qualifies for competition under the present racing rules, spoiled the fifth meet on the famous ocean boulevard. This intermittent space annihilator—it was as capricious as a coquette in its brief flying moods—appropriating the center of the stage disproportionately to its scant utilitarian automobile value, discouraged the presence of cars built to go the distance, and caused the speed gathering to be a lamentable failure, sickening to those who had worked most industriously for success, and disappointing to the comparatively few spectators who came here solely for the racing.

How the Steam "Bug" Ended Its Career.

Then, as if glorying in the havoc which it had caused, this chortling, creepy, mechanical being abruptly, on Friday, ended the meet with a startling catastrophe which left it bestrewn in pieces over the sands, and gave its pilot the closest kind of a call from a horrible death. None too securely fastened, apparently, the forward part of the crimson-hued coat raised when a bump in the beach was encountered; Marriott lost or had inadequate control; the car skidded, then slid along on its side, rolled over several times, ejected its abnormal boiler, and wound up its career a complete wreck, with the driver

limp and senseless underneath. Marriott's escape was marvelous, and a source of much thankfulness. His injuries are minor, and he will be about in a few weeks after several broken ribs have mended and other scars faded from view.

January Dates Were Most Inconvenient.

The weather, as a whole, was ideal—a vast change from that which existed during previous meets, when fur coats were frequently in demand. But the week was inconvenient to the automobile trade, owing to the proximity of the Chicago show, and this kept away some entrants who might not have been deterred because of the exaggerated presence of the Stanley "Tea-Kettle."

The two combined completed the destruction of the entry list, which had its final blow when information came that Wagner and the 1906 Vanderbilt Darracq and S. B. Stevens and the 1905 Vanderbilt Darracq were eleventh hour withdrawals. To designate them as withdrawals might not be exactly correct, for it seems that no entry blanks were signed, nor fees paid. W. J. Morgan says he thought he had a distinct understanding with the American Darracq Company manager, even though the blanks were not signed. The latter must have considered the understanding void when



THE FLORIDA BEACH NEVER APPEARED TO BETTER ADVANTAGE WITH ITS ARTISTICALLY DISTRIBUTED GROUPS OF SPECTATORS



DRIVER BLAKELY AND HIS 70-HORSEPOWER AMERICAN MERCEDES THAT WON THE LION'S SHARE OF HONORS.

the entry list dwindled to such small proportions—and it is true that the only car of Darracq caliber in the opens was the American Mercedes. Another time the indefatigable Morgan says he will not consider any entry actually made until the blank is signed and delivered. All around, this is the better plan for all concerned.

And What of Another Year?

When the débris of the wrecked steamer, which had not been carried away by the insatiable souvenir hunters, had been removed, and it was learned that the unlucky—or rather lucky—Marriott was not badly hurt, the officials and pressmen gathered at the clubhouse for a mid-day luncheon given by the Florida East Coast Automobile Association. President Asa Paine, one who is not discouraged easily, and L. R. Speare, the conscientious referee of the meet, were at the head of the table. A serious discussion of the future Ormond-Daytona meet took place, the keynote of which was that the day of sprint racing in automobile competition had passed; that not only the makers, but the public placed greater value on a car that could go the distance instead of one specially constructed for a short dash.

The question of a program for the 1908 meet was referred to a committee to consist of Chairman Jefferson deMont Thompson, of the A. A. A. Racing Board; S. A. Miles, manager of the N. A. A. M.; M. I. Brock, assistant manager of

the A. L. A. M.; Alfred Reeves, manager of the A. M. C. M. A.; President Asa Paine, of the F. E. C. A. A., and W. J. Morgan, its New York representative. This capable set of men will hold a session in the near future, and something definite concerning the next year's meet will be announced early in the summer—early enough to give time to prepare.



"LICENSED" DAY AND "INDEPENDENT" REEVES.

The Florida Gold Cup, a 300-Mile Race.

One suggestion for the 1908 meet is a 300-mile race, 150 miles a day, for the Florida Gold Cup, which shall go to the winner without any qualifications. Its value would be not less than \$1,500. Only cars which participate in this event, and shall travel at least 100 miles, to be eligible for free-for-all record trials, which would take place on the fourth day of the meet, the third day being occupied with stock-car races of not less than ten miles. For the Gold Cup race there might be required stock chassis and specified cylinder capacity or fuel limitation, and perhaps all three. The committee will wrestle with the rules, which shall be issued early enough to give makers an opportunity to comply with conditions imposed.

The Gold Cup race would be a winter Vanderbilt cup affair, and the Ormond-Daytona beach furnishes an ideal place. Its straightaway is 15 miles, and could be lengthened to 20 miles, and loops might be constructed at the two ends at a small expense.



PAINE, THE DRUMMER.

100-Mile Race for Minneapolis Cup Star Race.

Proof of the interest in long-distance racing was supplied by the only real race of the meet—the 100-mile contest for the Minneapolis Cup—won by a newcomer to the lists, the American Mercedes, skilfully handled by diminutive Blakely, whose work with the Continental-tired car from Long Island City places him in the ranks of cup drivers. Getting away in the lead, outclassing its opponents, the American duplicate of the famous European car traveled the century without a skip or trouble of any sort, giving a consistent performance that commanded the attention of the onlookers. The Rolls-Royce, rated at 20-horsepower—the Mercedes is given as 70—which had had a hollow victory in the international touring car championship, owing to a slight engine trouble that left the Welch *hors du combat* for the moment, survived the "hundred," though some distance in the rear of the winner. A. L. Kull's Wayne, and Ralph Owen's New York-to-Florida pathfinding Oldsmobile were still pursuing the even tenor of their way when Referee Speare found it necessary to call them from the beach in order not to interfere with the other races. No matter how small were the fields, Clerk of Course Reeves called them according to the planned schedule.

About Some of the Other Races.

The Welch, with its bright green, was a convincing winner on Wednesday of the 20-mile American touring championship, its 22:32 4-5 being a record for fully equipped stock cars at the distance.

F. E. Stanley drove one of his own cars in the 10-mile open on Wednesday, running a fair second to Blakely and the American Mercedes. Marriott and the "Bug" figured as a starter, but went down and out at about a mile, with both cylinders out of commission.

The Wayne, with A. L. Kull at the wheel, had a look-in on Thursday, taking the 5-mile standing start for cars listing between \$1,500 and \$2,500.

Previous to its sensational disintegration on Friday, Marriott's "Bug" had been unable to better its :28 1-5 mark of a year ago. On Monday it did :38 3-5 in an effort that was handicapped by the incoming tide; Thursday the figures were :31 4-5; and Friday before the accident the first mile was in :32 4-5, and then came one in :29 3-5, which encouraged Marriott to believe that the next attempt would bring a new record. Instead of this his life hung in the balance.

THE TALK OF THE TIDE-MADE COURSE.

Captain C. E. Hutton, the Rolls-Royce entrant, made many friends, his unassuming manner of looking after his interests commending him to the officials generally, and his car was always ready when required.

Tire representatives in attendance were: Joseph M. Gilbert, general manager, J. L. Gibney, Philadelphia manager, and W. A. Rutz, sales agent, Continental Caoutchouc Company; G. A. Davidson, Diamond Rubber Company, and A. J. Wills, B. F. Goodrich Company.

George H. Day, general manager of the A. L. A. M., who is spending a vacation in Daytona as a guest of J. B. Moore, a Hartford-Floridian, was a daily spectator. Mr. Day looks rugged, and it would appear that he did not require any rest unless he so willed it.

First Vice-President George E. Sebring, of the Florida East Coast Automobile Association, Wednesday night entertained some of the officials at dinner in his palatial new home in Daytona. Mr. Sebring and his brother are responsible for building of Sebring, Ohio, where they have one of the largest potteries in the world. In the club handicap Mr. Sebring's Winton was rated a probable winner, but in some manner the man from Ohio failed to run one-two-three.



AMERICAN MERCEDES AND THE "BUG" STARTING IN TEN-MILE.

One of the pleasant functions of the week was the dinner given Tuesday night at the Hotel Ormond by Joseph M. Gilbert, manager of the Continental Caoutchouc Company, and A. L. Kull, manager of the New York branch of the Wayne. Mr. Gilbert naturally was elated that the all-conquering American Mercedes wore Continental tires.

Prominent trades people present included Ray Owen, sales manager of the Reo Motor Car Company; R. E. Olds, the maker of the Reo line; A. W. Church, of Wyckoff, Church & Partridge; John W. Haynes, who drove the Haynes in the Vanderbilt race; Walter C. Baker, American Ball Bearing Company; Ray P. Johnson, Warner Gear Company; F. A. Davis, formerly of Gray & Davis.

L. H. Perlman, New York agent for the Welch Motor Car Company, celebrated the victory in the 20-mile American touring car championship by a dinner, Thursday night, at the Hotel Ormond. Mr. Perlman is an enthusiast, and when two other concerns which were to share a freight car with him for transportation of autos to Florida withdrew, he refused to be influenced, and bore the entire expense. John Brodsky, a well-known New York lawyer, accompanied him, and was one of the speakers at the dinner.

The building of a loop at each end of the Ormond-Daytona course would be comparatively inexpensive because of the abun-



CAPTAIN HUTTON'S ROLLS-ROYCE THAT WON DISTINCTION



L. H. PERLMAN AND THE WELCH TOURING WINNER.



THE WINNING WAYNE AND ITS DRIVER, A. L. KULL.

dance of road material near at hand. It has been suggested that at the Ormond end at least—and perhaps at the Daytona turn also—the road would continue from the beach all the way across the narrow peninsula and strike the picturesque Halifax river road, with its abundance of tropical foliage, and then swing back to the ocean over the hard-shell thoroughfare past the Hotel Ormond, the guests of which could watch the race from its plentiful verandas.

The officials were both experienced and conscientious, but, unfortunately, they had little to do as compared with former meets; a schedule arranged each day was faithfully observed. Referee, L. R. Speare, clerk of course, Alfred Reeves, starter, John W. Haynes, timers, "Jack" Kerrison and Walter C. Baker and judge, S. L. Haynes, were always on deck, and F. E. C. A. A. Committeemen Allen, Gore, Sebring and Parkinson helped wonderfully. President Paine drove his Winton repeatedly in order to fill out in races.

F. E. Stanley, the creator of the "Bug," has no idea of resurrecting his famous steam sprinter; in fact, he does not hesitate to make the definite statement that the worth of a single fast mile or two has depreciated to such an extent that it is no longer worth while to build a car for this single purpose. Mr. Stanley intends to return the Dewar trophy to Sir Thomas Dewar, the donor, and suggest to him the advisability of offering it in a race for a longer distance, at least ten miles, and perhaps more. Mr. Stanley apparently has studied the Christie car, for he states that it is his intention to bring forth a front-drive steam car in the near future.

SUMMARY OF 1907 ORMOND-DAYTONA MEET.

Monday, January 21.

TIME TRIALS AT ONE MILE.

Stanley, 30-h.p.; F. H. Marlrott.....	:38 4-5
:28 1-5, record held by same car and same driver.	
Curtis, 2 1-2-h.p.; H. G. Curtis.....	1:05 2-5

Tuesday, January 22.

FIVE MILES, ALL CLASSES, STANDING START.

1. American Mercedes, 70-h.p.; E. B. Blakeley.....	4:25
2. Rolls-Royce, 20-h.p.; Capt. C. E. Hutton.....	
3. Stanley, 20-h.p.; H. Ernest Rogers.....	

FIVE MILES, ALL CLASSES, FLYING START.

1. Stanley, 30-h.p.; F. H. Marlrott.....	3:44 4-5
2. Rolls-Royce, 20-h.p.; Capt. C. E. Hutton.....	4:52 4-5
3. Stanley, 20-h.p.; H. E. Rogers.....	

ONE MILE-A-MINUTE AMERICAN TOURING CAR CHAMPIONSHIP.

1. Stanley, 20-h.p.; Frank Durbin.....	:53 3-5
2. Rolls-Royce, 20-h.p.; Capt. C. E. Hutton.....	1:09 2-5
3. Stoddard-Dayton, 30-h.p.; G. D. W. Rose.....	

FIVE-MILE MATCH RACE.

1. Stanley, 20-h.p.; H. E. Rogers.....	3:51 4-5
2. American Mercedes, 70-h.p.; E. B. Blakely.....	

QUARTER-MILE HIGH-GEAR SLOW RACE, STOCK CARS.

1. Stevens-Duryea, 20-h.p.; W. A. Adriance.....	1:13
2. Peerless, 30-h.p.; W. C. Baker.....	
3. Oldsmobile, 30-h.p.; Ralph Owen.....	

ONE-MILE SPECIAL MATCH.

1. Oldsmobile, 30-h.p.; Ralph Owen.....	1:37
2. Autocar, 20-h.p.; Asa Paine.....	1:39

ONE-MILE MOTORCYCLE RECORD TRIAL.

Curtis, 2-cylinder; H. G. Curtis.....	:53 4-5
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Wednesday, January 23.

20-MILE AMERICAN TOURING CAR CHAMPIONSHIP.

1. Welch, 50-h.p.; L. H. Perlman.....	22:32 4-5
2. Winton, 30-h.p.; Asa Paine.....	28:16
3. Wayne, 35-h.p.; A. L. Kull.....	

20-MILE INTERNATIONAL TOURING CAR CHAMPIONSHIP.

1. Rolls-Royce, 20-h.p.; Capt. C. E. Hutton.....	
2. Winton, 30-h.p.; Asa Paine.....	

TEN-MILE, ALL CLASS, STANDING START.

1. American Mercedes, 70-h.p.; E. B. Blakely.....	7:42 1-5
2. Stanley, 20-h.p.; F. E. Stanley.....	7:52
3. Welch, 50-h.p.; L. H. Perlman.....	10:55

ONE-MILE MOTORCYCLE MATCH.

1. Curtis, 2-cylinder; H. G. Curtis.....	:46 2-5
2. Indian, 2-cylinder; W. Ray.....	:46 3-5

Thursday, January 24.

100 MILES, ALL CLASSES—MINNEAPOLIS TROPHY.

1. American Mercedes, 70-h.p.; E. B. Blakely.....	1:26:10
2. Rolls-Royce, 20-h.p.; Capt. C. E. Hutton.....	2:02:35
3. Wayne, 35-h.p.; A. L. Kull.....	
4. Oldsmobile, 30-h.p.; Ralph Owen.....	
5. Welch, 50-h.p.; L. H. Perlman.....	

TEN-MILE OPEN HANDICAP.

1. American Mercedes, 70-h.p.; 15 sec.; E. B. Blakely....	13:59
2. Franklin, 30-h.p.; Dr. Stinson.....	14:34 3-5 ✓
3. Winton, 30-h.p.; Asa Paine.....	14:34 4-5

FIVE-MILE TOURING CARS, \$1,500 TO \$3,000.

1. Wayne, 35-h.p.; A. L. Kull.....	5:52 1-5
2. Stevens-Duryea, 20-h.p.; W. A. Adriance.....	

ONE-MILE MOTORCYCLES.

1. Curtis, 2-cylinder; H. G. Curtis.....	:46 2-5
2. Simplex, 2-cylinder; Wm. Ray.....	:46 4-5

Friday, January 25.

SIX-MILE HANDICAP, F. E. C. A. A. MEMBERS.

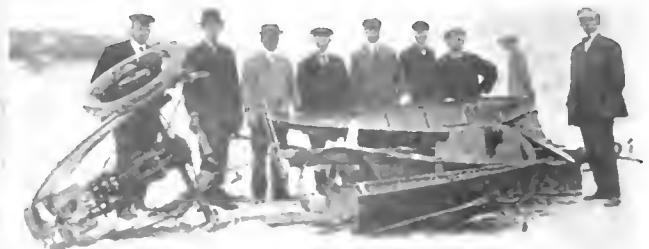
1. Cleveland, 30-h.p.; J. Laughlin.....	8:08 2-5
2. Cleveland, 30-h.p.; R. M. Bond.....	8:10 4-5
3. Stoddard-Dayton, 30-h.p.; G. W. D. Rose.....	8:47

TWELVE-MILE SPECIAL MATCH.

1. Rolls-Royce, 20-h.p.; Capt. C. E. Hutton.....	13:12 2-5
2. Franklin, 30-h.p.; Dr. Stinson.....	14:32 4-5 ✓

ONE-MILE RECORD TRIALS.

Stanley, 30-h.p.; F. H. Marlrott.....	:32 4-5
Stanley, 30-h.p.; F. H. Marlrott.....	:29 3-5



ALL THAT WAS LEFT OF THE STANLEY "BUG."

F. B. HOWER HEADS TOURING BOARD.

What the Touring Club of France has done for automobilists in the European republic, and how it has improved roads and hotels, protected historic sites, given information on tours, hotels and garages, used the weight of its 100,000 membership in legislative matters, and generally contributed to make touring easy and pleasant, is common knowledge. The Touring Board of the American Automobile Association intends to do as much for automobile travelers in the western republic. Under the chairmanship of Frank B. Hower, of Buffalo, who has just been appointed to the position by President Hotchkiss, the board will begin at once the collection of information of use to tourists, covering the present condition of laws and ordinances in force in the different States and cities of the country, the best routes between given centers, hotel and garage rates on such routes, and where they may obtain the most serviceable maps of any given territory. Dai H. Lewis, of Buffalo, has been appointed secretary of the Touring Board, and he will have charge of all the detail work, and will be in direct communication at all times with the office of the association in the Metropolitan Building, 1 Madison avenue, New York.

It is the belief of the new administration that the endeavors of the Touring Board in this direction will shortly put an inestimable value upon membership in the American Automobile Association not heretofore enjoyed, and from which benefits will be derived by American automobilists which will make membership in the A. A. A. a more valuable and essential asset.

Mr. Hower, the new chairman of the Touring Board, is an enthusiastic automobilist, is vice-president of the Automobile Club of Buffalo, of which he was one of the charter members, and is well qualified for this position, having rendered valuable service in connection with the management of the 1906 Glidden Tour. Mr. Lewis, the new secretary, is at present secretary of the Automobile Club of Buffalo, and in this position has established a touring bureau for the members of this club which is complete in every detail, and, owing to his extensive touring in this country, is especially well fitted for the work.

FEDERAL AUTO LAW TO BE ADVOCATED.

A strong forward movement is about to be made in the matter of inter-State automobile legislation. Charles T. Terry, the new chairman of the Law Committee of the American Automobile Association, and W. H. Hotchkiss, president of the A. A. A., have drawn up a bill on this subject, which will be introduced at the present session of Congress. If it should prove that a Federal law is liable to conflict with the rights of individual States, then efforts will be concentrated toward securing as uniform an automobile law as possible throughout all the States in the Union. It is hoped to pass a law whereby a motorist may certify to some department or bureau of the National Government that his automobile is duly registered in his own State, and that it is his intention to use the machine in other States. Upon complying with such regulation a certificate might be issued exempting him from additional registration.

In view of the growing complication of the automobile legal situation, this move is bound to meet with the approval and support of all automobilists. A meeting of representatives from all the automobile clubs in the State of New York will be held shortly, probably at Albany, when a definite policy on the motor legal situation will be mapped out.

INSURANCE BILL FAVORABLY REPORTED.

ALBANY, N. Y., Jan. 29.—Assemblyman Young's bill, authorizing the formation of insurance companies to insure against loss or damage to property resulting from accident to a duly licensed automobile, and against loss or damage to property when caused by an automobile, was favorably reported by the assembly insurance committee to-day.

KNOX STOCKHOLDERS ELECT DIRECTORS.

To celebrate the completion of the recently erected additions to the plant of the Knox Automobile Co., at Springfield, Mass., the annual meeting of the stockholders, which took place on Tuesday last, the 22d inst., was in the nature of an informal housewarming. The directors elected for the coming year are: E. H. Cutler, W. E. Wright, A. E. Smith, P. Murray, A. W. Cutler, H. G. Farr, W. H. Chase, M. J. Greenwood and George W. Bennett. The directors then reelected the present officers—E. H. Cutler, president, and W. E. Wright, vice-president. Under the Massachusetts law the secretary and treasurer are elected by the stockholders direct, A. E. Smith and H. G. Farr being continued in these posts. Following this, the directors elected the executive committee, which consists of E. H. Cutler, W. E. Wright, A. E. Smith, H. G. Farr and G. W. Bennett. The treasurer's report for this past year showed a surplus equal to 13 per cent. of the capital stock.

An inspection of the plant followed, the company having practically doubled its facilities during the past few months, so that it now has a daily capacity of four touring cars and one truck. The most recent addition is a four-story and basement building measuring 75 by 200 feet, while the new foundry is one of the largest in New England. It is of steel and reinforced concrete, even the sashes being of iron. All the bronze and aluminum castings used on the Knox cars are made here. The new body and trim shops have also been planned along the most modern lines.

VERMONT WILL IMPROVE ITS ROADS.

MONTPELIER, VT., Jan. 29.—The Vermont Legislature has passed a law providing for the improvement of public roads throughout the State, and the appointment of a State highway commission. The new law provides that the Governor shall appoint a State highway commissioner, whose term of office shall be two years from the date of his appointment, and who shall have control of and direct the expenditure of all moneys appropriated by the State, or apportioned to cities, towns, or villages for highway improvement. He shall appoint each year a supervisor in each county in the State, who shall assist him in supervising the expenditure of State money to be used for the permanent improvement of the main thoroughfares and most important roads in each town, the selection of roads being made with the main purpose of securing, so far as possible, trunk lines of improved highway from town to town, and to important local railway stations. For this purpose the sum of \$50,000 annually was appropriated, and under certain conditions a town may have free of charge the services of a competent road engineer.

PALM BEACH MOTOR BOAT REGATTA.

PALM BEACH, FLA., Jan. 29.—The Palm Beach Power Boat Association races successfully opened to-day with a substantial entry list, good racing, and plenty of enthusiasm. The handicaps were based on the rating measurements of the American Power Boat Association, but on the following days the actual performances of the boats are to govern. The bulk of the honors went to *Simplex VIII.*, owned by H. Broessel, Jr., of New York City. This new craft captured three of the five events. E. J. Schroeder's champion *Dixie* looked like a sure winner from scratch in the Class B event, but her bearings becoming overheated she was stopped to prevent being disabled for the remainder of the week.

AERONAUTS FROM SPAIN FOR AMERICAN RACE.

President Cortlandt Field Bishop, of the Aero Club of America, has received a cablegram from the Aero Club of Spain, naming Captain A. Duani, Lieutenant Herrera, and Señor Salamanca as entrants in the international balloon race to be held at St. Louis October 19. These three are the same ones who represented Spain in the 1906 race for the Bennett Cup.

AN INCIDENT OF THE AUTO SHOW.

"Say, young man," said a venerable-looking old gentleman, approaching an attendant, immaculate in the faultlessness of his evening toilet, who was gracefully posing in the foreground at one of the principal exhibits of cars at the show last week. "Are you connected with the blank exhibit?"

The good-looking salesman—a college graduate who has recently made his debut in the business of talking automobile, felt somewhat hurt that anyone should question his standing, but replied in the affirmative.

"Well, then, I want you to show me the differential of your car and explain its advantages," went on the visitor.

"The differential, you say; h'm, the differential, is it," mused the young man.

"Yes, yes, the differential. Not the differential calculus nor the differential tariff; the automobile differential. Where is it put and what does it do?—that's what I want to know."

"Well, now—oh, just step this way, please. No, not to that bare car, to this limousine—this way, over here."

"You see, my son, he knows all about automobiles," went on the old man, "and he's finally persuaded me that I ought to have one, but he says 'don't you go and buy any car that hasn't got a good differential on it. If you do,' he says, 'you're bound to have trouble. The first thing you know, when your car is running smoothly along the street you're going to skid and side swap something,' whatever he means by that."

"Oh, skidding, you say," replied the young man, feeling relieved, but keeping his weather eye out for that haven of refuge in all cases of embarrassing questions—the technical man of the firm.

"Well, we'll equip your car with any style of non-skid you desire, such as we have on this car here, for instance. And isn't that limousine a beauty?"

"But the differential isn't put in the tires, is it? My son told me it had steel cog wheels in it and was put underneath the car where you didn't see it."

"Oh, yes, you *mean* the differential," broke in the young man, as if he had discovered something quite novel.

"That's what I've been talking—"

"Just step over this way," exclaimed the young man in a business-like manner giving his inquisitor no further opportunity for expression by leading the way to another part of the exhibit.

"Now this here—this (oh, hang it! Why did I flag French) this—"

"Chassis," suggested a third party, who had been noting the young man's increasing embarrassment.

"Yes, this here chassis—I never can remember French," he added, apologetically. "This chassis"—lingering on the word—"will show you all about the differential and how it works."

"Will it—can it talk?" amusedly asked the old man. "Don't go away, it may need your help," continued the inquirer, and his would-be enlightener, who would have been only too glad to escape, wiped away the perspiration that had gathered on his forehead under an opera hat and set about elucidating the differential and its mysteries.

"Four speeds and reverse, selective type, direct drive on the high, no gears in mesh," he began.

"Well, but what are you talking about?" interrupted his hearer in a mild tone of surprise.

"Oh, yes, the differential. I thought you understood that was the subject of our conversation at the moment. Were you thinking of any other part of the car?" he inquired solicitously. Being assured on this point, he went on.

"Well, here we have the differential you have been inquiring about, four speeds and reverse, selective type, direct drive on the high, no gears in mesh, chrome nickel-steel shafts and gears running on ball bearings, aluminum case running in oil—running in oil," he repeated, striking a snag in the rehearsal of his lesson.

"But what has that to do with the wheels, and how does it prevent you from 'side-swapping' something when the car skids?"

inquired the old man in a puzzled tone. "What do you work this brass lever here for?—to prevent a collision?" (taking hold of the gear-shifting lever.

The young man wearily mopped his brow once more, though the Garden was cool at the time, and as he was doing so caught sight of the designer of the car who had just entered the booth. There was no need of a distress signal—the technical man took in the situation at a glance. He walked over and was introduced to the inquisitive visitor who wanted to see the differential before buying a car. This formality completed, the young man suddenly remembered that he had an engagement elsewhere.

NON-STOP THOMAS SETS A NEW RECORD.*

BUFFALO, N. Y., Jan. 28.—The non-stop Thomas flyer arrived in Buffalo last Friday morning about 5 o'clock, and left Saturday morning at 8 o'clock for Chicago, where the flyer will be kept running during the Chicago automobile show, which closes February 9. Ernest Kelly was at the wheel. Kelly's first run ended on Wednesday near Utica, when, because of the necessity of using gasoline purchased at various country stores, his carbureter became clogged, and the engine stopped after running continuously for 21 days, 3 hours and 29 minutes. This record will probably stand for some time, as it eclipses the former non-stop motor record of 200 hours, and also sets the highest mark for reliability of performance, as not one adjustment was made on the car from the time it started.

Word was received in Buffalo yesterday that Kelly and his crew were snowed in twenty miles east of Erie at 10 o'clock Saturday night. John Cowling, of Philadelphia, who is alternating with Kelly at the wheel, was doing the guiding. Kelly and his crew went to Erie by train, but hurried back to the point where the car was snowed, and aided the shovel brigade. Although the car was stopped, the engine was still chugging away.

While in Buffalo, Kelly said the engine was running better than when they started, and, barring accidents, would be in Chicago by the middle of this week. He said the roads were bad, ruts were deep, and the ground hard and frozen.

MAXWELL FUEL TEST PROVING SUCCESSFUL.

WORCESTER, MASS., Jan. 30.—Climatic conditions have not been favorable for the three Maxwell cars making the comparative fuel test from New York to Boston. Leaving Columbus Circus at 8:45 o'clock on Monday morning a successful run was made to Hartford, arriving at 8 o'clock in the evening. The next morning a start was made for this city and after a hard run, owing to the deep snow, the machines were garaged at 5 o'clock in the evening. The automobilists were met by representatives of the Worcester Automobile Club and enjoyed the hospitality of the club during dinner and the early hours of the evening. Since leaving Meriden, Conn., the worst road conditions have been encountered; frequently the cars sank into the soft snow almost up to their axles. Notwithstanding, the trio kept well together, gasoline, kerosene and alcohol all proving equal to the task. The only trouble causing delay was with tires. Two rear shoes had to be replaced, one at Springfield and the other at Worcester, the damage in both cases being done by twisting the chains when passing over street railway tracks. To-day the start was made for Boston.

LEON RUBAY MOVING UP TOWN.

The last of the original establishments of West Thirty-eighth street, New York City, is about to join the uptown movement. Leon Rubay, the well-known importer of French sundries, has leased the entire four-story building at 1697 Broadway, and is having it refitted to meet the requirements of his business. The ground floor will be used as salesrooms and offices, the second floor will be a showroom, the third floor will be a repair department for coils and magnetos, etc., and will be one of the best equipped shops for the care of ignition appliances in the city. The top floor will be used as a laboratory.

RULES FOR A. C. G. B. I. HEAVY CAR TOUR

LONDON, Jan. 24.—The Races Committee of the Automobile Club of Great Britain and Ireland has lost no time in issuing the conditions governing the new touring car event for 1907, as soon as it was found unworkable to hold the proposed contest concurrently with the Tourist trophy as a kind of subdivision. The object of the competition is the development of ideal touring cars such as are usually fitted with covered bodies and of the horsepower required by the ordinary users, as opposed to the racing car, and is not necessarily a race between existing standard types. The horsepower and consequently the speed are limited by fixing a definite allowance of fuel for a given distance. The event is open to cars of all nationalities and must take place between May 1 and October 1, the definite date to be fixed by February 1.

We take the following from the regulations for the contest, the minimum distance of which is 250 and the maximum 400 miles: The fuel to be used will be provided by the club and shall be a petroleum spirit of a specific gravity of 0.715 to 0.725 at 60 degrees Fahrenheit. It will be supplied for practicing purposes should competitors desire to use it. For 1907 the allowance will be a gallon to every 16 miles for the Isle of Man course and an equivalent amount for a different route. The car specifications are as follows: Driving wheels no less than 36 inches in diameter; tires on driving wheels no less than 920 by 120 mm.; track no less than 4 ft. 6 in.; distance from dashboard to front edge of back tires no less than 5 ft. 9 in.; platform behind dashboard no less than 8 ft. 6 in. long, to be covered by the body. There must be a clearance of at least 8 inches from the ground when the car is fully loaded. The total load to be carried by the chassis shall not be less than 2,240 pounds. Such ballast as may be necessary to bring the total load carried by the chassis up to 2,240 pounds must be provided by the competitor in form of lead securely fixed

to the floor and back seat boards, and of this weight 224 pounds shall be carried on the back seat boards. The body must be substantially constructed and easily removable. A wind screen must be fitted to every car, not more than 12 nor less than 6 inches from the back of the front seats and behind them. The top of the screen shall not be less than 8 feet from the ground nor the width less than 5 ft. 3 in.

Mud guards must be fitted to front and rear wheels; the steps must be continuous with the guards, which may only be attached to the chassis.

Every competing car must show that it is capable of being driven half a mile a 12 miles an hour or less on the level on the top forward gear and without the manipulation of the clutch. It will also be required to show that it is capable of being stopped, restarted, and ascending a hill of about 1:6 on a forward gear. A limited number of attempts will be permitted. Between the start and finish of the race the driver and his mechanic alone shall be permitted to assist a car, and no stores, supplies (except water), spare parts, or tires shall be taken on to the car during the race. The driver and his mechanic only shall be on the car during the race. Not more than two cars by one manufacturer will be accepted; the order of starting will be decided by ballot. The entrance fee for 1907 is £30 per car, of which £10 is payable on day of entry and the remainder on or before May 1. After this date, entries are received at a rising scale of £2 per week until a month before the date of the event.

Cars will be weighed with empty tanks; any car arriving after the time limit fixed will be disqualified. Every car which completes the whole distance will be re-weighed and fuel tanks, water tanks and lubricating reservoirs will be emptied by the club. Forms of application and for the necessary specification of cars will be forwarded from headquarters, 119, Picadilly, London W.

WHAT IS DOING IN EUROPE'S CAPITAL OF AUTOMOBILING

By PHARE.

PARIS, Jan. 24.—Thirty liters of gasoline for every 100 kilometers of distance constitutes the new and principal clause in the regulations for this year's Grand Prix race in France.

M. Clemenceau, the Prime Minister, acting in his cabinet capacity of Minister of the Interior, has just granted to the Automobile Club de France authority to run "a grand speed race" on a closed circuit of roads in France in 1907. Application to the minister (who is branded by the Opposition as the Dictator, the governmental, anti-Godhead, responsible for the movement to crush religion out of France), with a certain period of suspense, was only a formality. It was a foregone conclusion that the permit would be granted—refusal in the face of France's "greatest industry" would cause a crisis, auto, if not ministerial.

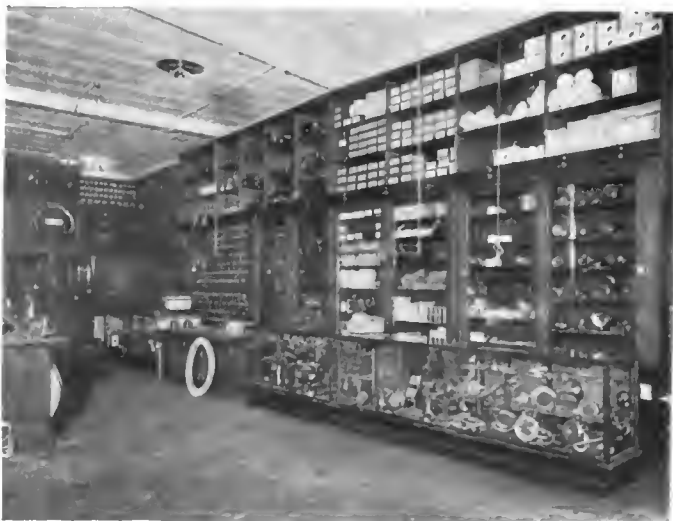
With permission to use 100 liters of petrol, the automobile firms entering machines for the race will not feel that they are being narrowly restricted. This quantity will amply answer the appetite of a racing monster, so that the contest is not likely to resemble a touring jaunt to Jersey City. A sort of minority committee in the French auto world has been advocating a reduction of racing machine powers. Many numbers of this coterie are constructors of vehicles that are very infrequently arrested for "scorching."

After all, why shouldn't automobiles be handicapped in races? Horses are handicapped, cyclists are handicapped, and many automobile manufacturers are handicapped in their work of producing machines to compare with those of their competitors in the trade. Limiting the fuel consumption to a certain quantity gives everybody a chance to start scratch, so that the man who comes up the road with a smaller quantity of gasoline prac-

tically grants himself the opportunity of starting behind scratch, hence, so much the worse for him.

Thomas A. Edison, whose close relationship with automobilism is widely known on account of that very small electric battery which has not yet been used to run the biggest automobiles, is to be honored in France, contemporary with his celebration, en famille, in America, of his fortieth year as an inventor. M. Emile Durer, a local author of reputation, who figured as envoyé from President Carnot when Mr. Edison was invited to come to Paris on the occasion of the exposition of 1889, has written an "electric" play, embracing chief events and episodes in the life of the Wizard. This play will be sung, danced and pantomimed. It is to be called "Edison," and the music has been composed by a "grand musician," whose name has not yet been divulged. "Edison" will be produced at one of the leading Paris theaters in the form of an electric fairy scene, and "on lines of elaboration heretofore unheard of."

Among the "unpatriotic" Americans who have recently purchased automobiles in Paris are Mr. Chisholm, president of the National Paper Company, 40-horsepower Bianchi; L. H. Spaulding, of New York, 40-horsepower Rochet-Schneider; Frank Gould, 14-horsepower C. G. V.; Stewart Browne, 70-horsepower Rochet-Schneider; S. S. Keyser, 20-horsepower Renault; Ernesto Fabbri, 75-horsepower Mercedes; George Gould, 10-horsepower Renault; Frank Tilford, 40-horsepower Rochet-Schneider; Mrs. Katherine Giles, of Pittsburg, 24-horsepower Fiat; Captain Bell, of New York, 24-horsepower Panhard; Jefferson Seligman, 40-horsepower Rochet-Schneider; the Misses Brice, of New York, 20-horsepower Renault.



AUTO SUPPLY COMPANY'S FINE GENERAL SALESROOM.

AUTOISTS HAVE DEVELOPED A NEW INDUSTRY.

Almost as rapid as the development of the automobile itself has been the extension of accessories, clothing and the thousand and one things for the car and its driver which modern refinement now asks for as necessities. Only a few years ago the manufacturer supplied the naked car, the hardware dealer stocked a few accessories, and at the clothier store some feeble attempt was made to clothe the automobilist. It was a transitory stage and had all the disadvantages of transition. The Auto Supply Company realized this, and made a vigorous and successful attempt to change the old order of things. It is no exaggeration to say that in their new store at 1733 to 1737 Broadway, New York, the automobilist will find everything necessary, useful or ornamental for himself or his vehicle. On the ground floor, with a 37 1-2-foot frontage on Broadway, are the car accessories. Lamps, tires, horns, speedometers, sparking plugs, electrical appliances, and all the stock fittings which every self-respecting car carries about with it are there in endless variety. Not only the fittings themselves, but every screw, bolt or clip required to fix them in position can be obtained. If the automobilist is luxuriously inclined, and hankers after elegant fittings, ingenious appliances, or the elegancies of handsome closed bodies, he will find them all under the same roof.

On the floor above a handsomely fitted-up room, with a 75-foot frontage on Broadway, the automobilist himself is provided for. A quarter of an hour spent with the clothing expert and you will be fitted out from head to foot in the most suitable auto



SECOND FLOOR, WHERE AUTOMOBILE CLOTHING IS SOLD.

clothing for winter or summer use, for racing or touring, for driving or for use as a passive traveler. The lady autoist is equally well provided for, and will find here auto clothing with a chic which betrays the work of the most skilled home and foreign designers.

Each department of the Auto Supply Company is in charge of an expert. The big stock of tires of all makes is handled by a man who has had long experience in tire manufacture; the hardware department is supervised by a practical tool-maker; the different accessory lines are each taken charge of by salesmen specially versed in that particular line; the clothing section is in the hands of men and women who have studied closely the sartorial art in its application to automobiling. Thus the buyer in selecting from an infinite stock has always the aid of highly-trained specialists.

RELIANCE TRUCK MAKES LONG WINTER RUN.

To publicly demonstrate the value of their commercial vehicle, the Gearless Transmission Company, of Rochester, N. Y., arranged a mid-winter run from Detroit to Chicago. The vehicle was a two-ton Reliance truck, equipped with gearless transmission, and a two-cycle engine, which started from Detroit last Saturday evening. On Monday morning Coldwater, Mich., was passed; on Tuesday morning South Bend, Ind., was reached, and on the same day Chicago was entered in triumph. The object of the tour was fully attained, for the Reliance truck, with its two-ton load, proved that it could be successfully driven over long distances in the middle of winter and deliver goods more promptly than shipments could be made by rail. This is one of the first, if not the first, attempt to drive a large commercial vehicle from one city to another in the heart of winter, and it shows something of the progress that is being made in this department. The truck is now being exhibited in space E No. 9 at the Chicago show, in the Armory Building.

A STATEMENT BY THE FORD ATTORNEY.

"Few people realize how much is at stake in this Selden litigation," said R. A. Parker, attorney for the Ford Motor Company, in the famous suit. "One hundred millions of dollars is a conservative estimate of the amount that is at stake in this growing industry and which would be jeopardized should the original contention of the licensed association be sustained. There are some thirty-three to thirty-five members of the licensed association still in business. Of the independent makers there are now considerably over one hundred concerns producing automobiles; and the independents now make over 60 per cent. of all the automobiles made in America and Europe. Could the ridiculous claims of Selden to a basic patent which would apply to every automobile built to-day—thirty years after the patent was originally applied for—be sustained by the higher court, all these concerns would be bankrupt. But the freedom with which astute and conservative investors put their money into the independent automobile enterprises is proof that this litigation, while formidable in appearance, is not taken seriously by those who ought to know. In short, there is no longer any doubt in the minds of the independents that Ford will win a clean-cut decision, and as a basis for this confidence we need only cite the evidence of the chief witnesses for that side, Selden himself, Dugald Clark, Bentley, and others in which they make damaging admissions which show that the A. L. A. M. no longer hopes, or even asks for, a decision so broad as to uphold the basic claims on which at first so much stress was laid, but that the most they hope for is some kind of decision upholding some kind of a patent, to which those concerns which were, through an appeal to greed and lust for monopoly, induced to become parties to the original scheme, may still be made to pay tribute."

COMPACTNESS IS FEATURE OF THIS CLUTCH.

A multiple disk clutch that will hold a 40-horsepower car and yet is so compact and light that it can be removed and held on one hand, is something new. The principle is one that has been tried for several years in Europe and improved upon by the Aerocar Company, of Detroit, until all objectionable features



NEW AEROCAR CLUTCH IS LIGHT.

have been removed, and a clutch, that is said to be ideal in its operation, obtained. The whole consists of 42 light thin disks, alternating steel and bronze. The 21 steel disks are made of high carbon steel and are forced to revolve with the flywheel. The 21 bronze disks are made of special phosphor bronze of the very finest quality and are fitted in grooves on the terminal of the transmission shaft. The disks run in dust-tight casings in a bath of oil. This prevents wear and permits of a gradual taking up of the load as the film of oil is forced from between the disks as the clutch is let in. By the use of the alternating steel and bronze disks, the cutting (which has always occurred sooner or later where only one metal is used) is entirely overcome and failure to work obviated.

Between each plate and carried on the steel plate are relief springs which make the action almost instantaneous. In the past, multiple disk clutches have had four, six and even eight compression springs placed at equal distances around the edge. In this new Aerocar clutch there is but one and that at the center working on a thrust ball bearing. The smallness of the whole is interesting. By removing six bolts from the flywheel and disconnecting the universal joint it can be taken out and easily held on one hand. It is very sensitive in operation and yet will start a standing load from the high gear on a hill. The clutch will be fitted on the new Aerocar models and will greatly enhance the value of those machines.

BRITISH AUTO TRADE BUOYANT.

Consul F. W. Mahin, of Nottingham, England, writes that the largest business on record is being done this year by the automobile and bicycle factories of England. The feeling in automobile-making circles is so buoyant and sanguine that confidence is expressed of entirely supplanting foreign cars with British in process of time. It would be impossible just now, for the home factories cannot supply the home demand. But new factories are being erected and old ones enlarged, and within a few years the aggregate plant is expected to be able to meet all demands. It is hardly possible that the present boom will continue unabated for any great length of time, and so there is danger of undue inflation and overproduction, and a repetition of the disaster which followed the bicycle boom a few years ago.

Large plans are being laid for this year in the motor-car branch, when a prodigious trade is expected. It is intended to produce a greater range of automobiles, and particularly cheaper grades, from 10 to 35 per cent. lower in price than the usual output of British factories. Several cheap makes have stood the test of experience, and these will be made specialties. While catering to a more extended custom, the production of such cars is aimed specially at France, whither British purchasers of this grade of stock have always turned. It is hoped that the bulk of this trade can now be kept on the British Isles.

FORD RUNABOUT PRICE RAISED A HUNDRED.

DETROIT, MICH., Jan. 28.—The most startling recent development in the local trade is the announcement by the Ford Motor Co. of an advance in price of the popular \$500 runabout. The same identical car will continue to be manufactured, but the public must pay an extra hundred for each of the runabouts sold in future. It is the \$600 machine hereafter, and the wise ones of the row predict that even another advance before long would be no surprise.

The Ford people give as the reason for an advance in price, that materials have so increased in value that it would have been impossible to turn out a runabout of such class as the Ford, at the old figure, without great loss to the factory.

Mr. Ford is off on an extended visit to California, but Vice-president Couzens says that the raise has been quite beneficial to the factories trade. "We have been simply swamped with orders in the past few days," said he. "People who have been holding off, expecting to get a car on spring delivery at the old price have simply stamped our way to get under the wire in time." This condition was anticipated by the Ford people, who held off making the announcement of the increase till the last moment.

The situation is interesting in view of the fact that another Detroit-made runabout is about to enter the field vacated by the Ford. The Brush runabout is to be a \$500 one, at least such was the announcement. From all accounts the Brush looks a pretty good proposition for the money, and the action of the Ford may indeed give the new concern a firm foothold, if a car of the class of the famous four-cylinder runabout can be turned out for \$500. The Brush will be shown for the first time at the Detroit show.

The report that the Winton Motor Carriage Company, of Cleveland, would open a sales branch in this city has been confirmed by Charles B. Shanks, sales manager for that company. A commodious and excellently equipped garage, such as the Winton maintains at the present time in New York, Boston, Philadelphia, Pittsburg, Cleveland, Chicago and London, will be seen here in the near future. The idea is to cater to Winton patronage, and assure satisfactory "up keep" of the Cleveland-made cars.

RATHER A UNIQUE GATHERING.

It is somewhat unusual to see any number of the Vanderbilt Cup race drivers together in any one place other than the course. The occasion depicted is that of the welcome extended to Wagner during his recent visit. He is shown sitting beside Elsie Janis, with Joe Tracy and Al Poole on the running board; Ralph Mongini forward; Walter Christie and George Robertson behind, and Vivet, Wagner's mechanic, at the rear wheel, the Simplex being the car used in the race scene on the stage.



ELSIE JANIS AND THE VANDERBILT CUP DRIVERS.

A MASSACHUSETTS TWO-PASSENGER RUNABOUT.

In bringing out its two-passenger runabout for 1907 it has been the aim of the Cameron Car Company, of Brockton, Mass., to produce a machine at once light, powerful for its weight, simple and not liable to mechanical derangement, durable and withal of very moderate cost. The result is an exceedingly smart runabout weighing but 900 pounds, but nevertheless carrying a four-cylinder motor that develops 16 horsepower at 1,000 revolutions a minute. The motor is air cooled, with the valves, all of which are mechanically operated, placed with their stems horizontal, the inlet valves on one side and the exhaust valves on the other. Long rocker arms extend from the crankcase, where their lower ends are acted upon by the cams, to the valves, which they actuate directly. These long rockers have the advantage of working without the long push-rods often used with overhead valve gear, and their length makes the movement on the pivots, which are attached to the cylinders by studs, very slight, insuring long wear. The spark plugs are screwed into the tops of the cylinder heads, and the timer is carried by a vertical shaft gear-driven from one of the camshafts, and is on the same level as the plugs, so that the wiring is short and direct.

But the most noteworthy feature of the car is the transmission. This was illustrated and described in *THE AUTOMOBILE* for November 8. Briefly, the entire transmission is mounted on the casing of the rear axle, which is of the live type, and is inclosed in an extension of the bevel gear and differential casing. The bevel pinion on the rear end of the propeller shaft meshes with a bevel gear on a short countershaft, and on this countershaft are three spur gears, of different sizes, which are adapted to mesh with a large spur gear carried on the differential casing. In changing from one speed to another the gears are not slid in and out of mesh, like ordinary sliding gears, but the countershaft is first moved away from the axle laterally, unmeshing the gears; then the gears are slid along until the proper one is in position and the lateral movement of the shaft is reversed, meshing the new combination. There are no more gears in mesh on the low speed than on the high. The reverse is obtained through an intermediate pinion. There are three forward speeds, the highest three to one, the intermediate four and a half to one, and the lowest seven to one.

Oak is used for the framing of the car and also of the body; the front axle is of I-beam section, and the rear axle of the type in which the wheels run on ball bearings on the ends of the tubes. Front wheels run on combination ball and babbitt bearings. Front and rear wheels are 28 inches in diameter, with 2 1-2-inch tires, in the regular equipment, but 3-inch tires will be fitted at an additional expense. With regular equipment, which includes oil side lamps, tail lamp, horn and tools, the price is \$750; with the special equipment, including 3-inch tires, actylene searchlights and generator, and a removable sloping rear deck, the price is \$850.

LYTLE AND THE PRESIDENT.

Herbert H. Lytle, the well-known driver of Pope-Toledos, was received at the White House by President Roosevelt this week (Monday). "The President was delighted," said Lytle, "and had me go into full detail about all the modern improvements installed in the 1907 Pope-Toledo. The President showed great interest in all the new features discussed and said that at his first convenience he would be glad to have me show him Washington by night in my 50-horsepower Pope-Toledo touring car. Even though his time is so completely taken up with important matters of State, he is far from being uninformed when it comes to mechanics, and I think he knows a car from bonnet to tail lamp."

"HANDS ACROSS THE SEA" IN AUTO SPORT.

A pleasant little exchange of felicitations recently took place between A. Darracq, the well-known French designer, and Henry Ford. M. Darracq was the recipient of a widely published interview with Mr. Ford, touching on the outcome of the Vanderbilt Cup race, in which the latter frankly stated the foreign car deserved to win, and, narrowing it down to the winner, praised the Darracq product. M. Darracq gave the article to the European journals for publication, and it was widely read and commented on in foreign trade circles. In acknowledgment of this courtesy on the part of Mr. Ford, M. Darracq writes his American confrère as follows:

"I have been deeply touched at the congratulations which you have been good enough to extend me on the occasion of the victory of our car in the Vanderbilt Cup race. Your praise is the more appreciated, as it emanates from one whose reputation is well known in Europe. I wish to assure you that the delicacy of your sentiment is appreciated, and I wish to thank you with all my heart. French cars will doubtless again meet American cars in an international contest. I hope you will be represented and that the meeting will always be in a friendly and sportsmanlike spirit as in the past. I thank you again for your kind words, and send you in return my best wishes for the success of your cars for the season of 1907. Please accept, dear sir, the assurance of my most distinguished regards. (Signed) A. Darracq."

NEW MOTOR LAWS IN SWEDEN.

The new motor laws long threatened for Sweden came into force on New Year's Day, and, in the main, resolve themselves into a wholesale restriction of speed. Towns and villages may only be traversed at a maximum of 15 kilometers in daytime, while the country's limit is fixed at 25, but after dusk only 10 kilometers are permitted both in town and country. Only persons over 18 years of age may drive a car, and must possess an official license. In Stockholm whole streets are forbidden territory to cars, and it is generally recognized that the unskillful setting up of the new act will do a great deal of harm and little good.

TWO CUP RACERS ALREADY UNDER WAY.

PHILADELPHIA, Jan. 29.—There is now being constructed by Jos. Parkin & Son, of this city, a car which is to be entered in the elimination trials for the next Vanderbilt race. It has six cylinders and is rated at 120 horsepower. Howard M. Ambler, of the Bergdoll-Ambler Co., is also building a cup racer and announces that it will be on the road in April next.



ISOTTA FRASCHINI RACES SHOWN AT OLYMPIA, LONDON SHOW.

NEWS AND TRADE MISCELLANY.

The Ciralsky building at 317 South St. Joseph street, South Bend, Ind., has been leased by the Tincher Motor Car Company, of Chicago.

Wing Brothers, proprietors of the American Automobile Company, of Tacoma, Wash., have moved into their modern concrete garage at 204-9 St. Helen's avenue.

Pierce & Isbell, the new agency for the Baker Electric Company, just opened at 1413 Michigan avenue, Chicago, announce that they will show five types at the coming Chicago automobile show.

R. E. Olds, president and general manager of the Reo Motor Car Company, of Lansing, accompanied by his wife, is now yachting about Florida waters on board his magnificent yacht the Reopastime.

A new garage is being built for the Reliable Automobile Company at Pacific avenue and Seventh street, Tacoma, Wash. Halstead House, a landmark, has been removed to make way for the improvement.

An organization has been formed in Brooklyn under the title of the Long Island Motor Trade Association. B. D. Underhill, of the Brooklyn Motor Supply Company, is active in the formation of the new body.

J. R. Thomas, the Maxwell agent in Washington, D. C., has leased for a term of years the large garage and salesroom at 1028 Connecticut avenue, and has removed from his former salesroom at 1319 L street, N. W.

A new make of automobile has been placed on the market by the Sinclair Scott Company, of Baltimore. The machine, to be known as the Maryland, has a 24-horsepower four-cylinder engine. Its selling price is \$2,500.

During the week of the Chicago show the Rushmore Dynamo Works will install nine 18-inch electric navy searchlights on the roof of their Chicago store, 1328 Michigan avenue. The store is only one block from the armory.

For the first time the entire Pope plant at Hartford is being devoted to the production of Pope-Hartford machines. Overtime is being worked to keep up with the strong demand, and from eight to ten cars are being shipped every day.

Contract for the steel work for the big Maxwell-Briscoe automobile plant at Newcastle, Ind., has been let to the J. D. Smith Construction Company. The contract calls for 1,200 tons of structural steel work, and the cost will be \$86,000.

Enlargements are being made by the Aetna Bottling and Stopper Company of their premises at 54 Peck street, Providence, R. I. The company has one of the largest repair shops in the city, and has recently acquired the local agency for the Grout gasoline car.

J. C. Cook, of Long Beach and B. L. Brown have purchased the interests of C. H. Kay and Phil Dorland in the Electrical Construction Company at 1126-1130 South Main street, Los Angeles. All Pope-Waverley models will be handled, and electrical work undertaken.

A ten years' lease has been secured by the American Locomotive Company on the entire sixteenth floor in the proposed

Cortland building of the Hudson Tunnel Company, at Church and Cortland streets. Floors in this structure will have 26,000 square feet of rentable space.

The Belle Isle Auto Company, Detroit, Mich., has secured a two-year franchise to operate an auto-'bus service across Belle Isle bridge and around Belle Isle. The fare will be 3 cents and 15 cents respectively. Four 18-passenger and three 36-passenger 'buses are being built at the Detroit machine shops.

These changes have been announced in the Jackson Auto Company, 312 W. Ninth street, Kansas City, Mo.: C. Boyd Richards retires as president, and is succeeded by W. A. Frank. Mr. Richards has sold his stock. F. L. Bumgardner is vice-president and treasurer. J. E. Halstead continues as secretary.

In printing the description of the new eight-cylinder Hewitt car, which appeared in the show issue of THE AUTOMOBILE, January 17, the price was given as \$5,500. It should have been added that this was for the car with a limousine body, the selling price being \$4,500 with a regulation touring body and equipment.

Application for a charter has been made to the Secretary of State by the Spartanburg Automobile Company, Spartanburg, S. C. The named capitalization of the company is \$5,000, and its incorporators are: Messrs. F. L. Bryant and Charles Parker. The proposed company will do a general automobile and supply business.

An interesting overland trip has been made by W. E. Kibbe, of Hartford, Conn., from Hartford to Ormond, Fla., in an 18-horsepower Columbia light touring car. Mr. Kibbe drove the car from Hartford to New York, and from there shipped it by boat to Jacksonville, Fla. From Jacksonville he drove overland to Ormond Beach, arriving just in time to see the opening races.

George H. Strout, of the Electrical Vehicle Company, expresses great satisfaction at the results obtained with the new Columbia multiple jet carburetor. The device really consists of two carburetors in one, designed to run the car to the greatest advantage at whatever speed is desired. The two work together, requiring no more adjustment or care than a single carburetor of earlier patterns.

Countess Hoyes, of Fuime, Hungary, has recently ordered a fully equipped 20-horsepower two-cylinder Maxwell car, which was shipped to her from Colonel Pardee's New York agency. Countess Hoyes is a granddaughter of Whitehead, of torpedo fame, and is accordingly an American by descent. This order is significant of the progress that the American automobile manufacturer is making in competition with the European makers.

Notwithstanding that it is only a year ago that the Lozier Motor Company took possession of their new four-story and basement building at the corner of Fifty-fifth street and Broadway, it has found it necessary to materially increase the facilities of its New York establishment. A lease has been taken on the entire third floor of the adjoining Pope building, which will give an increase of 7,000 square feet. A recent addition has been made to the works at Plattsburg,

N. Y., in the form of a building 60 by 160 feet, increasing the assembling and testing facilities materially.

At the annual meeting of the H. H. Franklin Manufacturing Company the following directors were elected: H. H. Franklin, E. H. Dann, John Wilkinson, Giles H. Stilwell, Alexander T. Brown, W. C. Lipe and Frank A. Barton. Inspectors of election: H. W. Chapin and John G. Barker. The directors elected the following officers: H. H. Franklin, president; Giles H. Stilwell, vice-president; Frank A. Barton, secretary; H. Barton Webb, treasurer. Executive committee: H. H. Franklin, Giles H. Stilwell and John Wilkinson. The report showed that the company had its biggest year in 1906, with prospects for a trade this year that will exceed the capacity of the plant.

An unusual record has been established by a set of Goodrich tires attached to the Oldsmobile in which Ralph Owen, of Cleveland, and a party of friends recently made a trip from New York to Florida, with a total load, including passengers and baggage, of about 4,000 pounds. The route lay over all sorts of roads, some so bad that ox teams would not travel over them. Upon arriving at Jacksonville it was found that the wheel chains, which were new on leaving New York, were completely worn out. An examination of the tires, however, showed that they were still in excellent condition after their 1,500-mile trip. As there had been no serious punctures en route, the air with which they had been inflated in New York was still imprisoned in the tires on arriving in Florida.

A special meeting of the stockholders of the Selden Motor Vehicle Company was held recently to vote on a proposition to classify the capital stock of the company, amounting to \$500,000, into preferred and common stock. The proposition was to divide the stock into 2,500 shares common, of the par value of \$100 a share, and into 2,500 shares of preferred, of the par value of \$100 a share. It was proposed to give the preferred stock a preference over the common stock in the assets of the company, and that the holders of such preferred stock shall be entitled out of surplus net profits to cumulative dividends not exceeding 7 per cent., in preference and priority to any dividends on the common stock. The entire proposition was carried. Building work on the East Rochester plant will be begun at a very early date.

A consolidation has been effected between the Correspondence School of Automobile Engineering, of Flatiron Building and 40 West Sixtieth street, and the New York School of Automobile Engineers, of 146 West Fifty-sixth street. Both concerns have been in existence on a substantial basis for over a year, the New York School of Automobile Engineers specializing resident instruction, while the Correspondence School devoted itself to the sort of business its name implies. As a result of the amalgamation a choice of either form of instruction or both in combination is made available. R. E. Olds, R. M. Owen and Robert H. Montgomery have transferred their interests. It is understood that Victor Lougheed will only remain long enough to put the consolidated concern on a satisfactory basis. In future the only address will be Fifty-sixth street.

NEW AGENCIES ESTABLISHED.

The Winton agency has been taken up by the Baltimore Motor Carriage Company.

Agencies for the Northern, Elmore and the Babcock Electric have been placed with the Mar-Del Automobile Company of Baltimore.

The Baltimore agency for the Wayne car has been secured by the Commercial Auto and Supply Company, at 862 North Howard street.

P. H. Greer, the Los Angeles agent for the Mitchell Company, has taken up the agency for the Marvel runabout, an \$800 car built at Detroit.

At 251 Jefferson avenue, Detroit, the Motor Sales Company has opened a new store for the handling of De Luxe and Queen cars. The interests of the company are being looked after by O. R. Baldwin and H. S. Goudy, two well-known business men of Detroit.

A new agency is about to be opened in Pittsburgh for the sale of the Matheson car, made by the Singer Sewing Machine Company at Wilkes-Barre, Pa. The agency will probably be managed as a branch of the Central Automobile Company of Cleveland. Edward J. Schellentrager is identified with the Pittsburgh office.

PERSONAL TRADE MENTION.

C. F. Green has been appointed Michigan manager for Witherbee Igniter Company.

Robert J. Firestone has been appointed sales manager of the Firestone Tire and Rubber Company, with headquarters at Akron, Ohio.

The superintendent for Meteor Automobile Works, Davenport, Iowa, is now E. Huber, late of Huber Automobile Company, Mich.

Stanley Brooks has taken up the position of Michigan manager for the Continental Caoutchouc Company. Marcus Allen has succeeded him at the Automobile Equipment Company.

Having resigned his position with the Crawford Automobile Company, W. W. Taxis, of 1840 North Park avenue, Philadelphia, is open to take up a position either at factory or as manager or assistant manager of branch house.

P. E. Hawley has resigned from the office of president of the Automobile Equipment Company, 260 Jefferson avenue, Detroit, in order to devote his entire time to the interests of Brandenburg & Co., of which he is a partner.

J. M. Gilbert, general manager, and James L. Gibney, Philadelphia representative of the Continental Caoutchouc Company, have returned from Florida. Continental tires were well represented on the winning cars at Ormond last week.

Henry Ford is enjoying a midwinter holiday jaunt in California in one of his big six-cylinder cars. He is accompanied by Mrs. Ford, his 12-year old son, Master Edsel, and Mrs. Ford's parents. The party will tour California from San Francisco to San Diego, and will visit the Lick Observatory on Mount Hamilton.

Among the principal speakers at the first monthly dinner of the New York Advertising League, held at the Aldine

Association, 111 Fifth avenue, New York City, Tuesday evening, was Robert L. Winkley, manager of the Publicity Department of the Pope Manufacturing Company. Mr. Winkley's talk was a subject of much favorable comment.

✓ H. H. Thorp, formerly of Franklin Automobile Company, and later with the Aerocar concern, is now sales manager for Deere-Clark Motor Car Company, Moline, Ill. He has placed agencies with Atlas Automobile Company, 102 West 107th street, New York; Bond Brothers & Co., Boston; Wm. Gilmon, Philadelphia; Davenport Automobile Co., Davenport, Ia., and others.

The White Company, of Cleveland, announces that Albert R. Warner has been made secretary of that concern. Mr. Warner has for nearly two years been in charge of the various White agencies throughout the country. He will continue his old duties in addition to shouldering the responsibilities entailed by his new position. Mr. Warner is a graduate of Cornell University, and is well known in Cleveland business circles.

✓ Arthur H. Robbins, formerly connected with the H. H. Franklin Motor Car Company, has succeeded Percy Owen as manager of the New York branch of the Aero Company. Mr. Robbins, who has been connected with the Ford and Pope companies, is planning an active campaign, and will undoubtedly increase the popularity of the Aerocar in the Eastern States. Mr. Owen recently withdrew to form the Percy Owen Motor Car Company in New York City.

NEW TRADE PUBLICATIONS.

Glide Automobiles, manufactured by the Bartholomew Company, Peoria, Ill., are described by text and engravings in an elegant catalogue produced by that firm.

Bouton Motor Company, 1675 Broadway, New York, give a brief description of Pullman cars in a recently issued folder. Their complete catalogue can be had upon request.

Smith & Mabley's new booklet "The Great Two," is a tasteful production descriptive of the well-known S. & M. Simplex cars. With it is an original souvenir postcard for those who have the postal habit.

All types of Waltham Orient automobiles are examined in general and in detail in the new catalogue of the Waltham Manufacturing Company, Waltham, Mass. Interesting particulars are given on what it costs to run a Buckboard.

Some idea of the extent to which long-distance coolers have been adopted will be gleaned from the Long Manufacturing Company's catalogue. Illustrations are given of the Long coolers fitted to a number of well-known cars and commercial vehicles.

"Stop Skidding" is a booklet describing Percy F. Megargel's trip across the Continent three times on Weed chain tire grips. It is interesting as descriptive of what an automobile can do, and incidentally points out the advantages of Weed Chain Grips.

"Sparks for Motor Ignition" is the title under which the Semi-Dry Battery Company, Newark, N. J., presents useful information on electric appliances for

automobiles. The man who wishes to be complete master of his automobile should obtain this pamphlet.

Archer & Co.'s new catalogue is an attractive booklet describing the automobiles built in the famous gun factory. It describes the Hotchkiss car in a way that is interesting to everybody, and with an interesting introduction by George Dupuy. The pamphlet is really worth reading. The printing and decorations are excellent.

The automobilist who contemplates a tour in France should secure a copy of "Automobile Formalities in France," distributed by Archer & Co., American agents for the Hotchkiss car. It is an elegantly produced booklet, compiled by the parent firm, and gives just the information the foreign autoist should have on how to secure a driving license and attend to other formalities in France.

"Touring Abroad" is an interesting little pamphlet put out by Smith & Mabley, Inc., and descriptive of touring in foreign lands as conducted by that firm's new European touring department. The new idea in touring Europe is that this well-known concern will provide a 30-horsepower Simplex touring car, seating six persons and chauffeur, for trips on the Continent. Smith & Mabley assume all responsibilities and attend to all annoyances of securing licenses, customs affairs, etc. A two-month's trip of 6,000 miles through France, Germany, Spain and Italy is planned.

One of the most luxurious and elegantly produced catalogues ever devoted to the automobile is just to hand from the Locomobile Company of America, Bridgeport, Conn. Produced in a chaste style in black and red, with numerous half-tone engravings, the whole is a masterpiece of the typographical art, and a book which will be turned over with interest by all, whether interested in automobiles or not. By text and cuts the various parts of the chassis are presented to the reader. Then follow scenes from the Vanderbilt Cup race, in which the Locomobile made such a good showing, half a dozen pages of illustrations show the Loco. touring in different parts of America or taking part in endurance contests; the next page and the reader is following the Loco. over Normandy's perfect roads and amid Scotland's wild beauty; still a little further and the Loco. is in France's chateau district, near the blue waters of the Mediterranean, and under Italy's azure skies. Another page and the car is on the streets of Brooklyn and New York. Those who have not seen the catalogue ought to see it; those who have will keep it.

RECENT INCORPORATIONS.

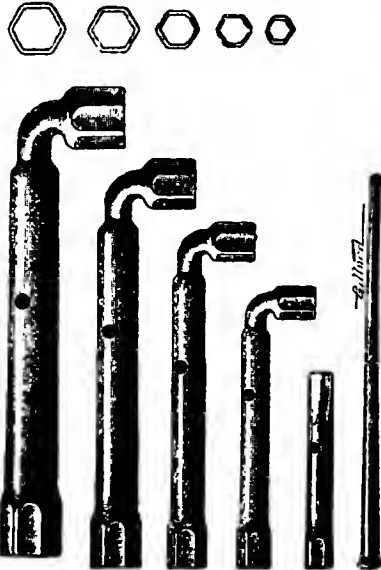
International Auto Company, El Paso; capital stock, \$10,000. Incorporators, Julius A. Krakauer, Charles M. Barber, of El Paso; Juan M. Salazar, of Chihuahua, Mex.

Iron City Automobile Company, Pittsburg, Pa.; to manufacture, sell, repair, lease and store automobiles. Incorporators, J. J. Seelie, John Weaver and P. S. Chambers.

Silver Lake Park Company, Atlanta, Ga.; to establish a club and resort for automobilists; capital stock, \$100,000. Incorporators, C. H. Ashford, E. C. Thrash, James R. Gray, William Owens, Hoke Smith, B. M. Blount, H. C. Bagley, M. F. Amorous, H. C. Stockdell, W. C. Caldwell, A. W. Farlinger, T. B. Lumpkin, E. Rivers, H. C. Ashford and Robert L. Berner.

INFORMATION FOR AUTO USERS.

French Socket Wrenches.—Socket wrenches in sets of six, eight and ten sockets of different sizes respectively are being imported from France by the Motor Car Equipment Company, 55 Warren street, New York. In one style the socket pieces are straight with two hexagonal sockets of different size, one at



HANDY IMPORTED WRENCHES.

either end, and in the other set the socket pieces are bent at a right angle to facilitate working in awkward corners. The socket pieces are made of well-tempered steel tubing, and are bored transversely near the middle to receive a small, straight steel handle for turning the wrenches. This handle is formed into a punch at one end, and at the other is upset to prevent the head pulling out of the socket hole.

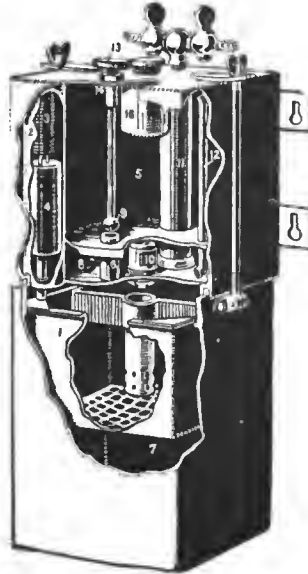
Rushmore Searchlights.—For the past seven years Rushmore lamps have been produced without any material change in their construction, and that they still



THE 1907 RUSHMORE SEARCHLIGHT.

maintain their position is shown by the extraordinary number of car manufacturers who make it their regular equipment. The special feature of these lamps is the extremely short focal length of the lens mirrors, by reason of which the burner can be placed very

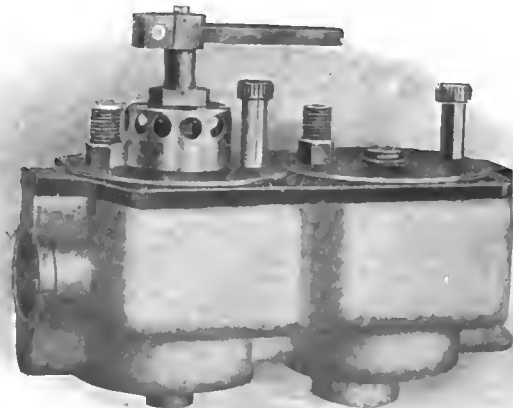
close to the front edge of the mirror, thus permitting the latter to utilize the maximum percentage of light. On account of its proximity to the burner, the



SKELETON VIEW RUSHMORE GENERATOR.

lens mirror is made of the toughest annealed lead glass, which stands the heat, and whose index of refraction is higher than that of the window glass commonly used. The Rushmore generator differs from others in having an independent movement to shake the carbide basket. As is well known, when the carbide basket is rigid with the generator a large portion of the dust fails to shake through, with the result that the lime blankets the carbide. This is prevented in the Rushmore by hanging the basket from opposite corners and suspending a lead weight by a spring over one of the free corners. The automatic water feed is controlled solely by the gas pressure.

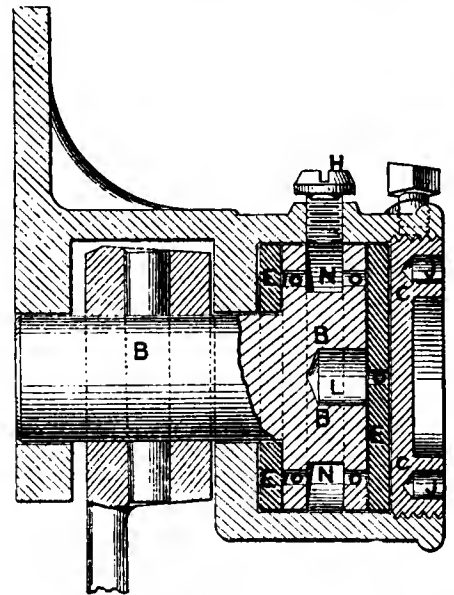
Ever Ready Carbureter.—The distinguishing feature of this instrument is the combination of two carbureters in one. One carbureter is connected with a small brass tank filled with volatile naphtha, and is used solely for starting. The other is thrown into operation as



EXTERIOR VIEW, NEW EVER-READY CARBURETER.

soon as the engine has warmed up, and is then capable of running on any kind of fuel, irrespective of whether it is low-grade gasoline, kerosene or alcohol. Another feature is that it promptly starts the engine in any kind of weather, whether it is zero, wet, foggy or dry. The Auto Improvement Company, 316 Hudson street, New York City, is marketing this interesting article.

Diezemann Shock Absorber.—The value of a well constructed shock absorber no longer needs to be pleaded. By adopting it as a standard equipment of their machines some of the world's best automobile manufacturers have given public testimony to its value in securing easier riding at higher speeds and decreasing the strain put upon engine and other mechanical parts. The Diezemann shock absorber, manufactured by the company of the same name at 1311 Hudson street, Hoboken, N. J.,



SECTION OF DIEZEMANN SHOCK ABSORBER.

is well known to the American public. In 1907 two sets will be constructed, one for cars over 1,800 pounds, the other for cars under this weight. The only structural change is that the bronze case is made heavier to resist torsional strain, and the grease reservoirs in the steel spindles are being made larger. Briefly, the Diezemann shock absorber

consists of a bronze casing containing fiber friction discs and a steel friction spindle bolted to the side member of the chassis, the friction discs being packed in grease and by means of a screw plug may be adjusted to yield the desired resistance. A copper seated set screw holds the adjusting plug in position, and a lever joins it up to a connecting link pivotally secured to a plate mounted upon the vehicle, axle or spring. All friction surfaces are packed in grease and are absolutely dust-proof.

An Improved Spark Plug.—To overcome one of the common defects of spark plugs, short circuiting due to a deposit of carbon, the Splitdorf plug has been devised. Its feature is the longest insulating surface possible without increasing the size of the plug in any way. A mica bushing is formed on a taper consisting of lateral windings of mica, composed of sheets, the full length



SPLITDORF IMPROVED SPARK PLUG.

of the insulator. This mica bushing is inserted into a small bushing or nut, and is forced to a solid formation by the central electrode. The mica bushing is so extended as to create an insulating surface of one inch. Outside of this a porcelain insulator is used, which increases the insulating surface to one and three-quarter inches in length. In addition to their greater length, the insulated parts are so designed as to break up the carbon deposit. Another desirable feature is the small amount of gas space inside the plug, thus preventing excessive heating. The plug is handled by C. F. Splitdorf, 17-27 Vandewater street, New York.

Automobile Tops.—At this season of the year some protection against rain, snow and hail is absolutely essential if automobiling has to retain its charms. The open touring car has manifest advantages over the heavy closed vehicle, providing it has some kind of protection against winter storms. The complete line of tops built by the Vehicle Top and Supply Company, St. Louis, are calculated to supply this need. Lightness, strength and graceful lines are all combined in this series, which include simple extension tops, runabout tops, full and three-quarter backs, fastened either by rear joints or front straps. Interesting features are front and side roll curtains by the use of which an open body can be entirely inclosed.

Imported French Rims.—Clincher rims that are different in some important particulars from those of domestic manufacture are being introduced in this country by the National Sales Corporation, and sold in New York as one of its specialties by the Motor Car Equip-



PEUGEOT CLINCHER RIMS FOR 1907.

ment Company of 55 Warren Street. Aside from the special quality of the metal used by the well-known firm of Peugeot Frères, the chief difference noticed in the French rims made by them is the saving of weight with no sacrifice of strength by the simple means of making the rim thin where it is supported from below by the wheel felloe, and increasing the thickness at the edges where strength is needed to hold the beads of the tire and to withstand occasional contact with stones, car tracks, curbs, etc. The edges are well rounded and smoothed off to prevent chafing of the sides of the tire, while the gradual thinning down of the metal from the edges to the base of the rim reflect the careful designing that is so noticeable in all parts of the best French automobiles and their fittings.

Improved Turntables.—Among the season's novelties in automobile sundries is a new and improved model of the Weber Turntables. The previous model looked like a pair of huge roller skates joined together by metal stirrups on which rested the tire of the automobile wheel. In the new model the tire rests in a trough-shaped steel casting mounted on three pairs of cast iron rollers pivoted like casters, one pair at the front and two pair at the rear. At the front end of the trough-shaped casting is an incline up which the wheel of the car will roll easily. The over-all measurements of the turntable are 28 inches in length and 16 inches in width, and the casting is large enough to take any size of tire. The turntable is amply strong to carry



WEBER TURNTABLES FOR GARAGE USE.

the weight of the heaviest touring car. A set of them is used under the rear wheels of a car to facilitate handling in a garage. The retail price is \$20 per set. The agency for them is held by the Motor Car Equipment Company, 55 Warren street, New York City.

A Few Facts About Asbestos.—One of nature's most wonderful and unique products is asbestos, a material, which, in spite of its extensive use, is comparatively unknown to the general public. Prior to 1850 it was looked upon principally as a curiosity, although Charlemagne (Roman Emperor from 800 to 814 A. D.) is said to have had a tablecloth made of asbestos, which he cleaned by throwing into fire.

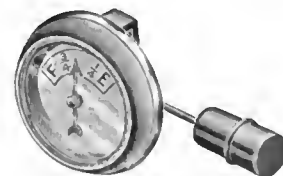
There are two varieties of commercial asbestos, known as Amphibole and Chry-

sotile. The former is used only to a comparatively small extent, as the fibers are short and without tensile strength, and are, therefore, not suitable for manufacturing many of the asbestos products. Amphibole is used to some extent in cements, but is not well adapted even for that purpose. Chrysotile, on the other hand, has a strong and silky fibre, which adapts it for such materials as asbestos fabrics, household utensils, theatre curtains, clothing for firemen, etc.

In Germany asbestos is known as steinfachs (stone flax), and the miners of Quebec give it quite an expressive name—pierre coton (cotton stone).

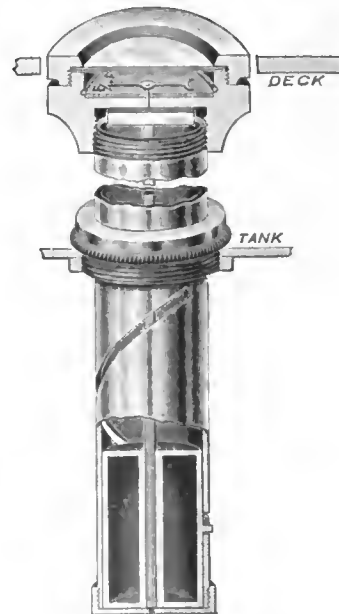
Asbestos is mined in open pits, similar to stone quarries, and although it is found in all parts of the world, the mines in Quebec, Canada, are the most famous, yielding about 85 per cent. of the world's supply of chrysotile. Probably the largest of these mines is that owned by the H. W. Johns-Manville Company, of New York. In 1879 the output of the Quebec mines was 300 tons, which has steadily increased year by year to 50,000 tons in 1905.

Gasoline Gages.—The Triumph Gasoline Gages, manufactured by the Boston Auto Gage Company, Boston, are designed specially for both automobile and motor boat tanks. The gage is magnetically controlled by a metallic



TRIUMPH JR. HANDY GASOLINE GAGE.

float, and may be connected with the top of a tank. The intermediate collar on the tube, shown on illustration, is screwed into a bushing connected with the top of the tank, and the gage tube is extended above the collar to the deck of the boat, where the head of the gauge having the



FLUSH DECK GAGE FOR MOTOR BOATS.

pointer will be protected by the usual deckplate. Lifting the lid of the deckplate shows the pointer that indicates the amount of gasoline in the tank. All gages are made of rustless material.

THE AUTOMOBILE

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No. 6

CHICAGO'S SHOW PRODIGIOUS AND PROSPEROUS

Combining Licensed and Independent Concerns, Numerically It Leads All Previous Exhibitions; Artistically It Presents a Most Pleasing Industrial Picture

By A. G. BATCHELDER.

CHICAGO, Feb. 6.—It is the show of the season that is taking place in the Coliseum and the First Regiment Armory. Circumstances may have made it so, but, nevertheless, it is so, and the astonished East must remove its goggles and doff its headgear to the energetic West, even though the raw weather requires the wearing of bulky fur coats, which coverings are mighty handy in traveling through "Pneumonia Lane"—an unavoidable, disagreeable feature—which connects the Coliseum and the Armory.

There are a hundred and a few more actual makers of automobiles housed in the two buildings; a scant few are newcomers, several of which give indications of obtaining a good foothold in the business. Chicago has always produced several additions to the industry, and a year later these ones have usually asked for an Eastern debut at the A. C. A. show.

The Show Includes the Best.

But the Coliseum-Armory show excels both the Madison Square Garden and Grand Central Palace affairs because it takes the greater part of the two metropolitan exhibitions, failing to obtain only a few of the "foreigners," and thus retaining more space for the American industry, which from the outset has held the West secure from the efforts of the importers of foreign cars.

It cannot quite be said that the "Licensed" and "Independent"

makers are all placed side by side in this "Sixth Annual Automobile Show," for in the membership of the National Association Automobile Manufacturers the "Seldenites" predominate in some degree, and so it must follow that they would have more of the commodious Coliseum and less of the somewhat inconvenient Armory, wherein, it so happens, only Smith & Mabley, Inc., and the Buick Motor Car Company hold forth as the unlucky ones

of the A. L. A. M. camp. In the Coliseum the fortunates include the White steamer, Baker, Babcock and Woods electrics, and Thos. B. Jeffery & Co., and such A. M. C. M. A. familiars as Maxwell-Briscoe, the National, American Mercedes, Stoddard-Dayton, Mitchell, Premier, Wayne, St. Louis, Smith, and Holman. All these intermingled with such names as Autocar, Cadillac, Corbin, Columbia, Elmore, Franklin, Knox, Locomobile, Lozier, Matheson, Oldsmobile, Packard, Peerless, Pierce, Popes of three kinds, Royal, Stearns, Stevens-Duryea, Studebaker, Thomas, Waltham, Walter and Winton, give an all-round significance which was lacking both in the Palace and the Garden.

The annex of the Coliseum is an improvement over the Armory, and those who make the journey through the draughty covered passageway have to take a view of its occupants, which includes Cleveland and Reo, Darracq and Mercedes, Harrison and Welch,



Columbus and Glide, and several others. Upstairs the annex spaces are light and comfortable, if less get-at-able.

All things considered, the allotments were accomplished in such manner as to do the best possible for all, the accessory folks having better facilities for exploiting their wares than in either previous big show. The onlooker must be given opportunity of seeing thoroughly and listening in comfort if his interest tempts him to linger in the range of the expositors' voice.

Wanted a Large Building for a United Show.

Once more comes the oft-repeated wish that there were in some large city of this broad land a building like the Grand Palais, of Paris, wherein all the leading makers could display their wares and thus demonstrate the magnitude of an industry that soon will be second to none in money invested and actual work to the country at large.

Decorative Scheme Finds Great Favor.

Of course, there will be some to dissent—prejudiced Easterners, the Chicagoans will call these critics—who will not admit that Manager Miles in his decorative scheme has seen the Swiss hand of the Garden and accomplished a more artistic touch in the dressing of the homely Coliseum and the ordinary Armory. Harmonious and appropriate seems the frequent face of Mercury at the steering wheel, and the fleeting youngster fits into the picture with a dash that typifies the spirit of automobiling. A score of large canvases illustrating touring and racing scenes add greatly in impressing the character of the exhibition, and the plaster friezes over the stands and around the balcony are automobilistic, which is the keynote aimed at in general. Green carpets with red borders and yards upon yards of red and white bunting, and a yellow sunset-tinged sky, which, alas, discourages photography, figure in the Coliseum decorating. An airship hangs from the center girders—here is a copying of A. C. A. recognition of the nearness of aerial motor navigation—and an abundance of American flags assists in the blending of the bright colors. Out in the Armory the ceiling has a green and white concealment. Some thirty thousand dollars is said to be the sum expended in beautifying the two buildings, and no matter if there is a bit of exaggeration in the statement, the work has been excellently done and meets with a more or less general approval.

A year ago the café feature in the Coliseum was too prominently indicated, and this time the entrance to the underground place of

refreshment and drinkables is unobtrusive, possesses an attractive entrance and has been entirely rehabilitated, much to the satisfaction of the patrons of the show and all others concerned.

Sales Promise to Be Substantial.

The Chicago show will do much business, judging from reports that appear based on fact and discarding the usual press agent stories of "output entirely sold." It is true that the two New York shows practically completed the disposal of the cars of a score of established concerns, but it must be kept in mind that the Chicago exhibition brings to this city innumerable agents from the Middle and extreme West, even out to the Pacific Slope. These men are from prosperous sections, where people want automobiles and are capable of buying cars of the costliest kind. The average Easterner has an idea that beyond Chicago there isn't much left of the country worth considering, but, if in the automobile trade, he only needs a trip here and an inspection of the list of agents who pour in from the boundless West at show time to cause him to revise his ideas very materially. Foreign cars may not sell in large numbers, for your Westerner is above all things American in what he thinks and always in what he buys. Importers, recognizing this fact, have devoted their main efforts to the East, which buys with less patriotism—and frequently pays more.

Some Day the Now Curious May be Buyers.

It may be the erroneous impression of an Easterner, but a study of the crowds which have daily filed into the Coliseum—plentiful in the afternoon and doubly so at night—would seem to indicate that there are many people living in Chicago and vicinity who have the desire to own, and not the price with which to buy, an automobile. The same percentage of the attendance at other shows may exist, but the patrons of the Chicago exhibition include not a few who wander about the aisles with small thought of possessing a car except in the indefinite future. Some day the "poor man's automobile" may become a reality, and if the non-buying thousands tell the story of the interest of the masses in the motor-driven vehicle there will be many to buy this car when its indefinite appearance becomes an actuality. Just now the makers have their work cut out for them in supplying the growing demands of those who are able to purchase in the period that will precede general standardization and a consequent decrease in the cost of production.



OUTSIDE THE DEMONSTRATING CARS WERE KEPT BUSY DESPITE THE VARIABLE BUT USUALLY INCLEMENT WEATHER.



PARTICULARLY WELL DONE ARE THE AUTO SCENES THAT ARE HUNG ABOUT THE COLISEUM—"NO. 9" IS TRACY CUP "LOCO."

THE MERGING OF THE TWO SHOWS IN ONE

By CHAS. B. HAYWARD.

CHICAGO, Feb. 5.—It is with some foundation in fact that Chicago has for the past three years claimed to have the only national automobile show held in this country, for it will be apparent on a little study of the subject to see that the annual event held in the Windy City is the only one that is truly representative of the American industry as a whole. Since the separation of the trade, so sharply emphasized by the holding of two distinct New York shows on different dates and in different buildings, it must be conceded that he who would see the industry housed under the same roof—or two of them, as no one has been found large enough—must come to Chicago. Chicago's show is truly national and Chicago glories in that fact. Nowhere else is there ever brought together at the same time such an infinite range of motor-driven vehicles. Here the Automobile is typified by every form of self-moving car. Here it is that indigenous product, the aptly named "Buggyabout," is at home. It is a true native, and it is one of those things that well exemplifies the saying that necessity is the mother of invention. This is a country of roads that are such in name only. Here the famous gumbo is to be found in all its glory, and the car that will continue to make progress when hub deep in this most tenacious of muds is indeed something that requires to be particularly designed with the quality of "get there" written large in its make-up.

The Buggyabout Very Prominent.

Never in the history of the industry has there been so much evidence of the combined effort that is bending toward that long sought for culmination, the "poor man's automobile." Minus its equine power that has for centuries past been its only means of locomotion, the buggy stands forth in essentially the same form that it has always preserved; high wheeled, box-bodied, and leather topped it is the same old buggy of our forefathers. But

beneath its shining black varnish and under its upholstered seat, it has been endowed with new and unseen, but not unheard, vitals—the internal combustion motor, usually of the two-cylinder opposed type. This, with a chain, rope or friction type of drive combines to make a power plan that is indeed simplicity in itself. Its driver finds need of scarcely more knowledge than that he required to look after the wants of "Old Dobbin." Like that time honored and uncomplained friend of humanity, the aid of the modern farmer is subject at times to sudden decease, but unlike its predecessor, there is seldom any need of holding obsequies, for with the widely spreading knowledge of the make-up of the gasoline motor, in the handling of which many a tiller of the soil is a past-master, the highwheeler occasionally gives out, but never dies.

The persistency with which a now well known Chicago firm has adhered to the manufacture of this type of vehicle during a number of years, despite that keenest of weapons, ridicule, showing what it could do, has brought home to a rapidly growing number of manufacturers for the first time, the possibilities and the promise which this truly American creation holds for the future. Here it is represented in the shape of the output of a number of manufacturers who are publicly uncovering their productions in the Coliseum and the Armory for the first time.

All Under the Same Roof.

To the blasé show-goer, not to mention that very large and constantly growing section of the automobile wise public, the national show which is an event long anticipated by the population of the Middle West, offers an opportunity to see what is being done in every factory in the land. Literally, of course, the cars are under two roofs, for even Chicago, accustomed as it is to doing big things, has not found time to provide one building that

would begin to house all those more than willing to pay for space. But, figuratively speaking, they are all sheltered by the same roof, for a trip through the aptly named "pneumonia alley" brings the visitor from one land of enchantment to another. At first he is scarcely able to believe his eyes, and indeed it does seem as if he had been led around the block and taken in another door of the same show, for in both he finds the same elaborate decoration under which every square foot of bare wall and column has vanished, leaving in its place a complete picture that at once delights and rests the eye. In both of the big buildings there is the same profusion of softly glowing lights shedding their radiance over a scene that is conceded, even by the majority of those, fresh from the famous effort that transformed Madison Square Garden into fairy land, to be without a peer.

Runabouts Are Much in Evidence.

Naturally enough the cars themselves come in for attention, first, last and all the time; they are the first thing to hold the visitor's attention once he has fixed in his mind the most salient features of the engaging picture. The bright rows of auto-

When the west has developed its highways and obtained those perfect running surfaces we all dream of, and most believe will come, the open runabout may have to give way under changed conditions. For the present it is here, and here to stay.

In the Realm of the Parts and Accessory Makers.

Once he leaves the cars below and ascends to the galleries, the autoist finds himself lost in a maze of exhibits, every one of which beckons him to stop and investigate, for here, girdling the entire building is an apparently never ending succession of booths to catch the eye and hold the attention. Whether it be tires, rims, wheels, the essentials of lubrication, carburetion or ignition, speed and distance recorders, headlights to show the way, or even those very fundamentals such as steels and other materials not readily recognizable in their present form, the showing is truly a representative one. There is a wealth of parts and accessories for the most inconsequential up to those which form part and parcel of every modern automobile that is astonishing and reveals in no uncertain manner the vast extent of this secondary industry which has been developed in such a short time and is here gathered together from all parts of the country.



TWO EXPONENTS OF AIR-COOLING WHICH ARE PLACED SIDE BY SIDE—IN COLD WEATHER DEMONSTRATING THESE CARS EXCELLED.

mobiles, big and little, with their mystifying machinery and their shining varnish and polished brass, are magnets that hold interested groups as long as the show is open. Fashion has decreed that the high powered runabout shall be the queen of cars, and manufacturers, one and all, have bowed to the mandate and have vied with each other in producing two and three-seated cars embodying comfort, speed, and power. Not even the maker of the silent electrics has been proof against the mysterious influence which is felt, though not seen, and to which the sales department must ever bend the knee. That this most handy form of high speed touring car has silently but surely wormed its way deep into the affections of the autoist, must be regarded as a foregone conclusion, when the number of these very racy cars staged here is taken into consideration.

Next to these, the ingenuity that the carriage maker has displayed in devising luxury in new forms in the shape of the gliding electric for the private use of milady and in the elaborately appointed closed bodies shown on the gasoline cars, which exemplify the last note that even the most skilled of designers has been able to sound, has provided a never ending source of keen delight and interest, particularly for the fair sex. Western road conditions are largely responsible for this runabout supremacy.

MEETINGS AND SOCIAL FUNCTIONS.

CHICAGO, Feb. 5.—The week is replete with various meetings and social functions. To-day the makers of electrics held a session. To-morrow the executive committee of the National Association of Automobile Manufacturers will consider the report of the contest committee, though no action will be taken until March as to the holding of an endurance run. Thursday the American Motor Car Manufacturers' Association will hold its annual meeting, and either James Couzens will continue as chairman of the committee of management or Benjamin Briscoe will succeed to the place. Mr. Briscoe desires that Mr. Couzens shall continue, but the latter inclines to having the former take the chairmanship. Three new concerns will be admitted to membership, bringing the total up to forty-three makers of cars. The mechanical branch of the Association of Licensed Automobile Manufacturers will have one of its monthly discussions to-morrow.

At the meeting of the Electric Vehicle Makers to-day officers serving the past year were re-elected as follows: President, Colonel George Pope; vice-president, George Studebaker; secretary, Robert K. McLloyd; treasurer, M. L. Goss.



PHOTOGRAPHERS HAD DIFFICULTY IN OBTAINING GOOD GENERAL VIEWS, ONE HANDICAP BEING THE POOR LIGHT WHICH FILTERED THROUGH THE YELLOW MADE SKY.

THE WINTER JOURNEY OF A RELIANCE TRUCK.

Three hundred miles over frozen, rutty roads, and no end of snow, is the record of one of the most unassuming exhibits in the Armory. It is the Reliance truck that came into Chicago under its own power and ran to the show on its own wheels. In addition to the heavy snow already on the ground, considerable part



THE TRUCK THAT MADE THE MIDWINTER RUN.

of the trip was made through a steady snowstorm with the mercury dropping out of sight in the tube all the time. The trip was made to demonstrate the efficiency and reliability of the Gearless transmission with which the Reliance two-cylinder, two-cycle 30-horsepower truck was equipped. It is made by the Gearless Transmission Company, of Rochester, N. Y., and has been adopted as the standard equipment of the Reliance trucks.

In addition to a dead load of a ton and a half, the truck carried a live load consisting of George F. Day, sales manager of the Reliance Company; George D. Wilcox, manager of the Gearless Transmission Company, and O. W. Davis, inventor of the transmission, in addition to a supply of gasoline and lubricating oil sufficient to last the entire run of 300 miles. The actual running time for that distance was 33 hours 49 minutes, which included the time spent in replenishing the oil cups on the road each day. This means an average of nine miles an hour throughout, and

that's going some for a loaded truck under such adverse conditions. The truck is geared to make a maximum speed of 15 miles an hour, and on one road an average of 13 miles an hour was maintained for three consecutive hours.

The start was made from Detroit, Saturday, and the first stage of the run ended at Ypsilanti, Mich., at 5.45 that evening, 32 miles having been covered. Sunday was a banner day, for 7.50 in the evening, after twelve hours on the road, found the party at Coldwater, Mich., a distance of 82 miles. The day's achievement was the more remarkable owing to the fact that the entire road was a succession of grades varying from 5 to 12 per cent. Another day's run landed the expedition at South Bend, Ind., a distance of 79 miles, this part of the run being over good roads though buried under considerable snow. Had there been any necessity for it the next lap might have been made the last, but taking things easily, Hobart, Ind., a distance of 68 miles, was made just shortly after sundown that evening. The next day's run was a mere jaunt of 43 miles to Chicago, which was made in the excellent time of 3.44, the arrival being at 11.05 a. m. The car was equipped with solid tires, and to give traction sections of heavy logging chains were wrapped around the rear wheels, the only things that made progress possible through the heavy snow which was encountered throughout the trip, varying from a few inches to two feet in depth, the drifts nearly burying the front wheels altogether at one place.

Racing Cars Attract the General Public.—"That's the racer which took part in the Vanderbilt Cup race," was constantly spoken by visitors to the Locomobile, Thomas, Matheson and Haynes stands. It seemed as though everyone had heard of the big race and knew the names of the cars which participated in the American automobile derby. Around these motor warriors there was invariably a gathering of interested onlookers, even at the Apperson stand, where photographs only told the story of the company's hard luck in the practice which preceded the Elimination Trial, the views of the racer wrapped around a telegraph pole were in constant inspection. H. N. Harding, who drove the Haynes car in the Elimination Trial, was a notable figure around the Oldsmobile exhibit, for which concern he will be a speed pilot in the coming season's racing events.



WELL-DISPLAYED EXHIBIT OF THE WHITE STEAMERS WHERE THE LIGHTING WAS SUPERB.

CONCERNS INVITING ATTENTION AT CHICAGO

AMERICAN GASOLINE PLEASURE VEHICLES.

Adams Company.....Dubuque, Iowa	Marble Motor Car Company.....Detroit, Michigan
Aerocar Company.....Detroit, Michigan	Matheson Motor Car Company.....Wilkes-Barre, Pennsylvania
American Locomotive Auto Company.....New York	Maxwell-Briscoe Motor Company.....Tarrytown, New York
American Motor Car Company.....Indianapolis, Indiana	Mitchell Motor Car Company.....Racine, Wisconsin
Apperson Brothers Auto Company.....Kokomo, Indiana	Moline Automobile Company.....East Moline, Illinois
Auburn Auto Company.....Auburn, Indiana	Moline Pump Company.....Moline, Illinois
Aurora Motor Works.....Aurora, Illinois	Monarch Motor Car Company.....Monadnock Block, Chicago
Austin Auto Company.....Grand Rapids, Michigan	Moon Motor Car Company.....St. Louis, Missouri
Autocar Company.....Ardmore, Pennsylvania	Motor Car Company.....Detroit, Michigan
Bartholomew Company.....Peoria, Illinois	National Motor Vehicle Company.....Indianapolis, Indiana
Buckeye Manufacturing Company.....Anderson, Indiana	Nordyke Marmon Company.....Indianapolis, Indiana
Buick Motor Car Company.....Jackson, Michigan	Northern Motor Car Company.....Detroit, Michigan
Cadillac Motor Car Company.....Detroit, Michigan	Olds Motor Works.....Lansing, Michigan
Cleveland Motor Car Company.....Cleveland, Ohio	Packard Motor Car Company.....Detroit, Michigan
Blomstrom, C. H., Motor Company.....Detroit, Michigan	Peerless Motor Car Company.....Cleveland, Ohio
Chicago Coach & Carriage Company.....1223 Michigan Ave., Chicago	Pierce Engine Company.....Racine, Wisconsin
Corbin Motor Vehicle Corp.....New Britain, Connecticut	Pierce, George N., Company.....Buffalo, New York
Daimler Manufacturing Company.....Long Island City, New York	Pope Manufacturing Company.....Hartford, Connecticut
Dayton Motor Car Company.....Dayton, Ohio	Pope Motor Car Company.....Toledo, Ohio
De Luxe Motor Car Company.....Detroit, Michigan	Premier Motor Manufacturing Company.....Indianapolis, Indiana
Deere-Clark Motor Car Company.....Moline, Illinois	Rainier Company.....Broadway and Fifth Street, New York
Diamond T Auto Company.....3 Huron Street Chicago	Rapid Motor Vehicle Company.....Pontiac, Michigan
Dolson Auto Company.....Charlotte, Michigan	Reliable Dayton Manufacturing Company.....4515 Evans Ave., Chicago
Dorris Motor Car Company.....St. Louis, Missouri	Reo Motor Car Company.....Lansing, Michigan
Dragon Auto Company.....Philadelphia, Pennsylvania	Royal Motor Car Company.....Cleveland, Ohio
Electric Vehicle Company.....Hartford, Connecticut	Smith Auto Company.....Topeka, Kansas
Elmore Manufacturing Company.....Clyde, Ohio	Smith & Mabley (Inc.).....Broadway and Fifty-sixth Street, New York
Evansville Auto Company.....Evansville, Indiana	Staver Carriage Company.....Auburn Park, Illinois
Forest City Motor Car Company.....Massillon, Ohio	Stearns, F. D., Company.....Cleveland, Ohio
Franklin, H. H., Manufacturing Company.....Syracuse, New York	St. Louis Car Company.....St. Louis, Missouri
Harrison Motor Company.....Grand Rapids, Michigan	St. Louis Motor Car Company.....Peoria, Illinois
Haynes Automobile Company.....Kokomo, Indiana	Stevens-Duryea Company.....Chicopee Falls, Massachusetts
Holman Auto Company.....Monadnock Block, Chicago	Studebaker Automobile Company.....South Bend, Indiana
Jackson Auto Company.....Jackson, Michigan	Thomas, E. R., Motor Company.....Buffalo, New York
Jeffery, Thomas B. & Company.....Kenosha, Wisconsin	Thomas, E. R., Motor Company.....Detroit, Michigan
Kessler, W. S.....Jackson, Michigan	Triumph Motor Car Company.....Cragin Station, Chicago
Kissel Motor Car Company.....Hartford, Wisconsin	Waltham Manufacturing Company.....Waltham, Massachusetts
Kline Company.....1610 Michigan Avenue, Chicago	Wayne Automobile Company.....Detroit, Michigan
Knight & Kilborn.....1240 Michigan Avenue, Chicago	Weich Motor Car Company.....Pontiac, Michigan
Knox Automobile Company.....Springfield, Massachusetts	Western Tool Works.....Galesburg, Illinois
Lear, Oscar, Auto Company.....Columbus, Ohio	White Company.....Cleveland, Ohio
Locomobile Company of America.....Bridgeport, Connecticut	Winton Motor Carriage Company.....Cleveland, Ohio
Logan Construction Company.....Chillicothe, Ohio	Woods Motor Vehicle Company.....110 East Twentieth Street, Chicago
Lozler Motor Company.....Broadway and Fifty-fifth Street, New York	

AMERICAN ELECTRIC PLEASURE VEHICLES.

Babcock Electric Carriage Company.....Buffalo, New York	Pope Motor Car Company.....Indianapolis, Indiana
Baker Motor Vehicle Company.....Cleveland, Ohio	Rauch & Lang Carriage Company.....Cleveland, Ohio
Columbus Buggy Company.....Columbus, Ohio	Studebaker Automobile Company.....South Bend, Indiana
Electric Vehicle Company.....Hartford, Connecticut	Woods Motor Vehicle Company.....110 East Twentieth Street, Chicago

AMERICAN COMMERCIAL VEHICLES.

Biddle-Murray Manufacturing Company.....Oak Park, Illinois	Logan Construction Company.....Chillicothe, Ohio
Buckeye Manufacturing Company.....Anderson, Indiana	Mitchell Motor Car Company.....Racine, Wisconsin
Gearless Transmission Company.....Rochester, New York	Rapid Motor Vehicle Company.....Pontiac, Michigan
Lear, Oscar, Auto Company.....Columbus, Ohio	Soules Motor Car Company.....Detroit, Michigan

IMPORTED GASOLINE CARS.

Lear, Oscar, Auto Company.....Columbus, Ohio	Smith & Mabley (Inc.).....Broadway and Fifty-sixth Street, New York (Isotta Fraschini).
Mercedes Import Company.....590 Fifth Avenue, New York	Tilston, C. A., Company.....1406 Michigan Ave., Chicago (Westinghouse & Renault).
Renault Freres Selling Branch.....1776 Broadway, New York	
Kline Company (Napier).....1610 Michigan Avenue, Chicago	

[FROM THE WORLD'S RUBBER FACTORIES.]

Ajax-Grieb Rubber Company.....Broadway and Fifty-seventh St., N. Y.	Harburg Tire Company.....232 West Fifty-eighth St., New York
Continental Caoutchouc Co. American Branch, 43 Warren St., N. Y.	Hartford Rubber Works.....Hartford, Connecticut
Diamond Rubber Company.....Akron, Ohio	International Rubber Company.....Milltown, New Jersey
Electric Rubber Manufacturing Company.....Rutherford, New Jersey	Michelin Products Selling Co. (Inc.).....31-33 W. Thirty-first St., N. Y.
Firestone Tire & Rubber Company.....Akron, Ohio	Morgan & Wright.....Detroit, Michigan
Flak Rubber Company.....Chicopee Falls, Massachusetts	Pennsylvania Rubber Company.....Jeannette, Pennsylvania
Goodrich Company, B. F.....Akron, Ohio	Puncture Proof Tire Company.....Cleveland, Ohio
Goodyear Tire & Rubber Company.....Akron, Ohio	Republic Rubber Company.....Youngstown, Ohio
G & J Tire Company.....Indianapolis, Indiana	Swinehart Clincher Tire & Rubber Company.....Akron, Ohio

LIGHTING THE ROAD AHEAD.

Acetyvone Company.....38 Park Row, New York
 Avery Portable Lighting Company.....Milwaukee, Wisconsin
 Badger Brass Manufacturing Company.....Kenosha, Wis., and N. Y.
 Dietz Company, R. E.....60 Laight Street, New York
 Edmunds & Jones Manufacturing Company.....Detroit, Michigan
 Gray & Davis.....Amesbury, Massachusetts
 Imperial Brass Manufacturing Co.....245 So. Jefferson St., Chicago
 Prest-O-Lite Company.....Indianapolis, Indiana
 Rose Manufacturing Company.....Philadelphia, Pennsylvania
 Rushmore Dynamo Works.....Plainfield, New Jersey
 Standard Lamp & Manufacturing Co.....43 So. Canal St., Chicago

CLEARING THE ROAD AHEAD.

Gabriel Horn Manufacturing Company.....Cleveland, Ohio
 Stewart & Clark Manufacturing Co.....69-71 Wells Street, Chicago

SMOOTHING OUT THE ROUGH ROADS.

Baldwin Chain & Manufacturing Co.....Worcester, Massachusetts
 Diezemann Shock Absorber Company.....1316 Hudson Street, N. Y.
 Gabriel Manufacturing Company.....Cleveland, Ohio
 Hartford Suspension Company.....67 Vestry Street, New York
 Hotchklin, P. M.....4017 Lake Avenue, Chicago
 Kilgore Air Cushion Company.....50 Columbus Avenue, Boston
 Sager, J. H., Company.....Rochester, New York

GETTING A FIRM GRIP ON THE ROAD.

Weed Chain Tire Grip Company.....28 Moore St., New York
 J. H. Sager Company.....Rochester, New York

KEEPING WITHIN THE LEGAL LIMIT.

Auto Improvement Company.....308 Hudson Street, New York
 Jones, Joseph W.....New Rochelle, New York
 Jones, W. S.....112 North Broad Street, Philadelphia
 Lipman Manufacturing Company.....Beloit, Wisconsin
 Oliver Instrument Company.....Minneapolis, Minnesota
 Post & Lester Company.....Hartford, Connecticut
 Smith Manufacturing Company, R. H.....Springfield, Massachusetts
 Stewart & Clark Manufacturing Co.....69-71 Wells Street, Chicago
 Veeder Manufacturing Company.....Hartford, Connecticut
 Warner Instrument Company.....Beloit, Wisconsin
 Webb Manufacturing Company.....Newark, N. J.
 Winchester Speedometer Company.....1557 Broadway, New York

THE GROUND WORK OF THE CHASSIS.

Adapt Machinery Company.....1624 Wabash Avenue, Chicago, Ill.
 American and British Mfg. Company.....Bridgeport, Connecticut
 Bethlehem Steel Company.....Bethlehem, Pennsylvania
 Brown-Lipe Gear Company.....Syracuse, New York
 Cramp, Wm. & Sons, Ship and Engine Bldg. Co.....Philadelphia
 Cullman Wheel Company.....1026 Dunning Street, Chicago
 Gemmer Engine Company.....Wabash, Indiana
 Hartford Auto Parts Company.....Hartford, Connecticut
 Kinsey Manufacturing Company.....Dayton, Ohio
 Long Manufacturing Company.....1436 Michigan Avenue, Chicago
 Muncie Auto Parts Company.....Muncie, Indiana
 Prosser & Son, Thomas.....16 Gold Street, New York
 Spicer Universal Joint Mfg. Company.....Plainfield, New Jersey
 Shelby Steel Tube Company.....Shelby, Ohio
 Turner & Fish Company.....21 Quincy Street, Chicago
 Warner Gear Company.....Muncie, Indiana
 Warner Clutch Company.....135 Adams Street, Chicago
 Weston Malleable Steel Company.....Detroit, Michigan
 Whitely Steel Company.....Muncie, Indiana

WHAT THE CAR RUNS ON.

Midgley Manufacturing Company.....Columbus, Ohio
 Schwartz Wheel Company.....Philadelphia
 Turner & Fish Company.....21 Quincy Street, Chicago

THE LUNGS OF THE MOTOR.

Byrne, Kington & Co.....Kokomo, Indiana
 National Sales Corporation.....269 Broadway, New York
 Wheeler & Schebler.....Indianapolis, Indiana

KEEPING THE MOTOR COOL.

Kinsey Manufacturing Company.....Dayton, Ohio
 Long Manufacturing Company.....1434 Michigan Ave., Chicago

THE ANTI-FRICTION BRIGADE.

Hess-Bright Manufacturing Company.....Philadelphia
 Hyatt Roller Bearing Company.....Newark, New Jersey
 Steel Ball Company.....Chicago
 Timken Roller Bearing Axle Company.....Canton, Ohio

THE ESSENTIALS OF LUBRICATION.

Detroit Lubricator Company.....Detroit, Mich.
 Dixon Crucible Company, Joseph.....Jersey City, N. J.
 Harris Oil Company, A. W.....Providence, R. I.
 Hancock Manufacturing Company.....144 E. Erie St., Chicago
 McCord & Company.....Old Colony Bldg., Chicago
 New York & New Jersey Lubricant Co.....14-16 Church St., New York
 Imperial Brass Manufacturing Co.....245 S. Jefferson St., Chicago
 National Oil Pump & Tank Company.....Dayton, Ohio
 W. C. Robinson & Sons Company.....433 N. Third St., Philadelphia
 Steel Ball Company.....840 Austin Ave., Chicago

THE POWER TRANSMITTERS.

Baldwin Chain & Manufacturing Co.....Worcester, Massachusetts
 Diamond Chain & Manufacturing Co.....Indianapolis, Indiana
 Whitney Manufacturing Company.....Hartford, Connecticut

THE IMPORTANT FUEL SUPPLY.

F. S. Bowser & Co. (Inc.).....Ft. Wayne, Ind.
 National Oil Pump & Tank Company.....Dayton, Ohio

INFLATING THE TIRES.

Wray Pump & Register Company.....Rochester, N. Y.

LIFTING THE CAR.

Cook Standard Tool Company.....Kalamazoo, Mich.

ELECTRICAL NECESSITIES.

American Electrical Novelty & Mfg. Co.....308 Hudson Street, N. Y.
 Atwater, Kent Manufacturing Company.....Philadelphia
 Bemus, T. Alton.....294 Washington Street, Boston
 Byrne, Kington & Co.....Kokomo, Indiana
 Dayton Electrical Manufacturing Company.....Dayton, Ohio
 Duplex Coil Company.....Fond du Lac, Wisconsin
 Motalinger Device Manufacturing Company.....Pendleton, Indiana
 Remy Electric Company.....Anderson, Indiana
 Splittdorf, Charles F.....17-27 Vandewater Street, New York

THE VITAL SPARK OF LIFE.

Auto Parts and Equipment Co.....2224-34 Michigan Ave., Chicago
 Chicago Battery Company.....Chicago
 Dayton Electrical Manufacturing Company.....Dayton, Ohio
 Hanel, John A., & Company.....Eldridge Court, Chicago
 Motalinger Device Manufacturing Company.....Pendleton, Indiana
 National Carbon Company.....Cleveland, Ohio
 National Sales Corporation.....269 Broadway, New York
 Remy Electric Company.....Anderson, Indiana
 Splittdorf, C. F.....17-27 Vandewater Street, New York
 Vesta Accumulator Company.....1536 Michigan Avenue, Chicago
 Witherbee Igniter Co.....541 West Forty-third Street, New York

PROTECTION FROM THE ELEMENTS.

London Auto Supply Company.....1221 Michigan Avenue, Chicago
 Randa Manufacturing Company.....Detroit, Michigan
 Sprague Umbrella Company.....Norwalk, Ohio

WITH THE UNIVERSAL PROVIDERS.

Arnsteln, Eugene.....Thirty-fifth Street and Shields Avenue, Chicago
 Auto Supply Company.....1339 Michigan Avenue, Chicago
 Auto Accessories Manufacturing Company.....Detroit, Michigan
 Beckley Ralston Company.....80 Michigan Avenue, Chicago
 Detroit Motor Car Supply Company.....Detroit, Michigan
 Excelsior Supply Company.....235 Randolph Street, Chicago
 Franco-American Auto and Supply Co.....1414 Michigan Ave., Chicago
 Post & Lester Company.....Hartford, Connecticut
 Motor Car Equipment Company.....55 Warren Street, New York
 National Sales Corporation.....269 Broadway, New York
 Willis, E. J., Company.....8 Park Place, New York

FINISHING THE CAR.

Pantasote Company.....11 Broadway, New York
 Valentine Varnish Company.....257 Broadway, New York

WITH THE SWIFT TWO-WHEELERS.

Armac Motor Company.....472 Carroll Avenue, Chicago
 Aurora Automatic Machinery Company.....Aurora, Illinois
 Consolidated Manufacturing Company.....Toledo, Ohio
 Fowler-Manson-Sherman Cycle Mfg. Co.....45 Fulton Street, Chicago
 Harley-Davidson Motor Company.....Milwaukee, Wisconsin
 Hende Manufacturing Company.....Springfield, Massachusetts
 Reading Standard Cycle Manufacturing Company.....Reading, Pa.

MISCELLANEOUS EXHIBITS.

Chicago Pneumatic Tool Company.....Chicago, Illinois
 Chicago School of Motoring.....264 Michigan Avenue, Chicago

SHOWN FOR THE FIRST TIME IN CHICAGO

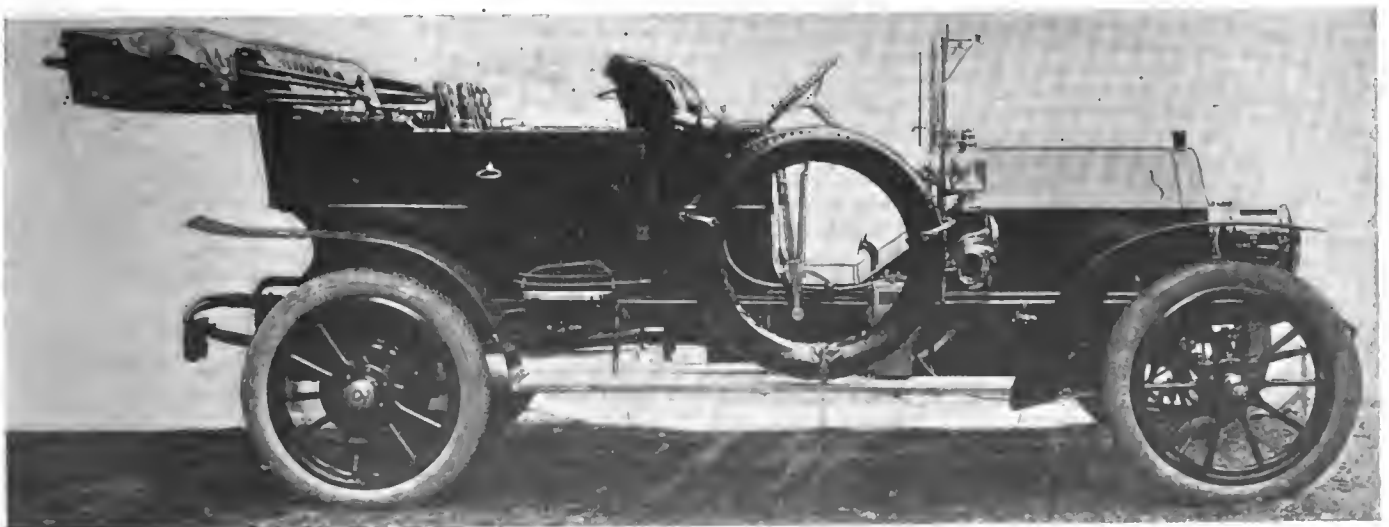
Diamond T Motor Car Company, Chicago.—This is a new firm to enter the field of manufacturing high powered touring cars of the standard type, though its product, which is making its debut at the present shows, reveals the touch of an experienced hand, as its design combines all those features of standard practice which have come to be recognized by designers the world over as best adapted to give the service required by the exacting conditions under which the modern automobile is operated. It is a car of very attractive lines as well, and despite the fact that it is equipped with a 50-horsepower motor and is designed in keeping throughout, the weight has been kept down to the very reasonable limit of 2,800 to 2,900 pounds through the use of high-grade materials and the adoption of only the most advanced types of accessories, such for instance, as an improved form of honey-comb radiator of very light though durable construction, and which requires an exceedingly small amount of water to maintain the motor at the proper temperature.

A Simms-Bosch magneto of the high-tension type has been adopted as the source of ignition current, supplemented by a battery system using a set of accumulators and working through a dash four-unit coil, each side of the ignition system being entirely independent of the other, so that there are in reality two sources upon which to rely in a case of emergency. Transmission is by means of sliding gear with final drive by propeller shaft; semi-elliptic springs of generous proportions and of the best make form the suspension, the chassis being mounted on 36 by 4 1-2 wheels, the purchaser being given an option on tires of any standard make.

Three models are listed using the same chassis as a foundation—a special high-speed runabout at \$3,250; fully equipped touring car at \$3,500, and an attractive limousine at \$4,250. In the matter of equipment this firm has made an innovation that will be appreciated by the average purchaser. For instance, in the case of the touring car, the selling price includes a folding glass wind-shield, a pair of 9-inch Rushmore search-lights, a Jones speedometer and a cape top of best quality, the equipment of the other models being similar, in keeping with the purpose for which they are intended, so that when delivered to the buyer the car is all ready for the road, and there is no necessity to add several hundred dollars to its cost before it can be considered complete.

Marvel Motor Car Company, 284 Rivard Street, Detroit, Mich.—The \$800 Marvel runabout is making its debut here, and as it is in a class by itself its advent has been looked forward to with considerable interest. It is a typical two-seater of attractive aspect, the power plant consisting of a two-cylinder horizontal opposed engine of modern design, with a capacity of 14 horsepower at moderate speed, and has great pulling power. Like its larger compeers, it is equipped with a cone clutch and shaft drive, a two-speed and reverse planetary gear forming the intermediate step and making a sort of "foolproof" unit power plant and transmission. The wheel-base is 84 inches, tread standard, and the weight of the car in complete running order, all on, is in the neighborhood of 1,200 pounds. The wheels are 30 by 3 inches and pneumatic tires of standard makes are included in the equipment, as well as the usual outfit of side lamps and tools. The Marvel is a car of which more will undoubtedly be heard during the coming season, if not in the immediate future. Its bid for popularity is a strong one.

Chicago Coach & Carriage Company, 1223-31 Michigan Avenue, Chicago.—This firm has entered the field of automobile building by bringing out one of the increasingly popular "buggyabouts," which have formed such a prominent feature of the present show. It is called the Duer, Model A, and it embodies many wrinkles of modern automobile construction not usually found in this type of car, and not ordinarily open to the manufacturer owing to the low figure at which such cars are offered to the public. The Duer is the first of its kind to combine the regulation bonnet in front demanded by fashion with the high-wheeled and solid-tired buggy type of vehicle that is necessary for the navigation of many of these sub-aqueous western roads, which are generally a mixture of six parts water to four parts mud. On this account it has been equipped with 44-inch front and 48-inch rear wheels, fitted with side wire solid rubber tires. The wheel-base is 72 inches and the tread standard. The motor is of the two-cylinder horizontal opposed type, air-cooled, and is placed forward transversely under the bonnet; it has automatic inlet valves and every part is made readily accessible, so much so that the whole motor may be dismantled in 30 minutes.



ONE OF THE WESTERN NEWCOMERS: 40-50-H.P. DIAMOND T TOURING CAR, SHOWN FOR FIRST TIME.



MODEL "A" DUER, OF THE CHICAGO COACH AND CARRIAGE CO.

Ample exhaust piping and large valve dimensions have been used, a separate muffler being employed for each cylinder.

Motor suspension is on the well-known three-point principle. The transmission giving two speeds ahead and reverse is of a special patented type, made especially for use on this car. Directly beneath the motor there is a secondary or jack shaft running at right angles to the crankshaft. Upon this is supported the transmission connected to the motor shaft by a telescopic universal joint. The jackshaft runs on roller bearings resting on slides at each side of the car just under the sills, permitting the entire transmission unit plenty of lateral play in order to tighten or relieve the tension on the power cables. The car is steered by a side lever, and is operated entirely by a single lever, which gives all the speeds. The car lists at \$750.

Franco-American Automobile Supply Co., Chicago.—As its name indicates, this firm may most aptly be termed one of the "universal providers," for nothing of merit in the line of auto supplies, whether produced abroad or in this country, is foreign to its stock. Prominent among its imported specialties are Michelin tires and the products of the "Maison Rubay," which means, of course, La Coste ignition accessories in the shape of French coils, magnetos, timers, plugs, electric lamps and limousine fittings; the "MAB" French annular ball bearings; the "O. S." Odospeedometer and "les phares" Bleriot, this house being the first to make automobile lamps and headlights. In domestic productions, it is hard to know where to begin to enumerate the endless variety in which the necessities of the car and the autoist are handled. There are the Look ignition accumulators, "Franco" oil cans and drip pans, portable garage turntables, a novel and compact tank whistle for direct connection to the engine whether marine or automobile, "the "W. & N." ready valve remover, the Robert line of pocket meters, Kingston carbureters and other specialties made by this house; "Fite Fire" extinguishers particularly designed to be carried on the car or in the motor boat as well as for garage use; the Bell compound tire pumps and positive pressure indicators, the Monahan Antiseptic Company's "Green Oil" soap for cleaning the auto bed and running gear; the numerous specialties made by the Turner Brass Works, such as Turner bronze foot treadles. Ross fluid level indicators for tanks, Martin gasoline strainers and multiple feed lubricators, the Turner carbureter made in four sizes and a number of others. Then there are the "Never-Miss" specialties, such as Never-Miss plugs, ammeters, wire terminals and chain repair devices; the Black Hawk dry batteries and meters; the Oliver Instrument Company's "Index" speed indicators and odometers, "American" headlights,

the "Channon" repair kits and the "Amco" specialties, such as fenders, extra tire holders, long distance horns and others which are made by the Appliance Manufacturing Company of Chicago, Ill. A new line is that of the Adapt Machinery Company, in the shape of folding glass windshields in all brass frames, auto bumpers, tire irons, chain tools, mechanical oilers, brass and iron auto trimmings of every kind and general auto machine work, this firm having special facilities for this class of operations. Other specialties are the Woodworth detachable treads made by the Leather Tire Goods Company, the "Auto-Cle" handy socket wrenches and Stanwood steps; "E. & J." headlights and lamps made by Edmunds & Jones Manufacturing Company, of Detroit; the Hotchkiss "anti-jolt" device, which is the invention of P. M. Hotchkiss, of this city; "rapid" wrenches and "Westbrook" acetylene gas generators made by the E. T. Kimball Company, Boston, Mass.; the Kilgore Shock Eliminator made by the Kilgore Auto Air Cushion Company, also of Boston, "U. S." Jacks; Cox repair kits; "Stop One Minute" tire adjusters; "Helmet" and "Primus" motor oils; Wiley tire and lamp covers; Charter spark plugs, and numerous others, for many of which this company has the exclusive agency, and of others the entire western territory.

Stewart & Clark Mfg. Company, Chicago.—The Stewart Speedometer is a product of the home soil that made its debut at the Garden last month, where it aroused no little interest, and is now being publicly exhibited in its own birthplace for the first time. Realizing the curiosity of the public to see the "works" hidden by the compact, polished brass case, the manufacturers of the Stewart have taken advantage of it to reveal the small number of parts that constitute the mechanism of their instruments, and have placed them on display in show cases in their booth in the Annex. In addition to this, two of them are also shown in operation under conditions approaching as closely as possible to the use under which they run when on the car. They are mounted on a dashboard, and are run through the regulation flexible shaft and gearing from a standard automobile wheel. Two styles are shown, one calibrated to read up to 60 miles an hour, and the other up to 120 miles. The instrument is based on the principle of centrifugal force, and has been designed particularly with a view to giving what is known as a "dead-beat" reading; in other words, the pointer remains steady at all speeds, and does not jump or vibrate back and forth. All parts are designed of generous proportions and are well finished. The trip and season mileage are shown on a Veeder Odometer. They are also showing the "Long Distance" Siren—the auto signal that is different, and that never fails to clear the road ahead.



ARTISTIC OLD ENGLISH MAIL COACH BODY FITTED TO APPERSON.

London Auto Supply Company, Chicago.—"Lasco" glass fronts are being specialized by this firm. They are of the folding type, and are characterized by a degree of neatness and simplicity that is a relief to those autoists who can recall their struggles with the old-time glass wind shields. The folding feature, and the ease with which adjustments can be made merely by loosening two generously proportioned wing nuts, or thumb screws, is a strong recommendation, for the solid glass shield often becomes a menace to the driver in wet or muggy weather, and removing it entirely results in undue exposure. The "Lasco" fronts are made of 3-16-inch clear plate especially selected for this purpose and measure 25 by 39 inches, folding at the center. Over all the dimensions are 32 by 42 inches, the frames being hardwood finely finished in black, oak or mahogany, trimmed all around with heavy brass binding. The hinges, stay rods and other trimmings are of solid polished brass.

the recoil so that no matter how hard the bump the passengers are not thrown off their seats. It is very easy to attach and requires no oiling or adjustment when once in place on the car. The price per set of four is \$60. This firm also shows the McKinney removable tire holder and the Baldwin block and roller auto and machinery chains, as well as a line for cycles and motorcycles.

McCord & Co., Old Colony Building, Chicago.—In addition to the McCord force feed lubricator, to which this firm has so long devoted its attention with the result that it is a part of the standard equipment of many of the best known makes of cars, they are now turning out a line of carbureters that bid fair to come in for the same extent of favorable consideration that has been shown their predecessors in the lubricator field. Beside this, they are manufacturing radiators as well as the McKim copper-asbestos gaskets.



A GENERAL VIEW IN THE FIRST REGIMENT ARMORY, WHERE MANY PROMINENT CONCERNS ARE HOLDING FORTH COMFORTABLY.

Bethlehem Steel Company, South Bethlehem, Pa.—The exhibit of this firm is one of great interest to the engineer in that it shows what can be accomplished by the science of metallurgy as applied to the improvement of the component parts of the automobile. Mounted on a plate are shown five pieces representing the various stages through which a drop-forged crankshaft must pass in its transformation from a square rod of steel to the finely finished piece of work ready for the assembler. A large number of drop-forged parts for various other purposes are also shown, as well as test pieces of steel, one in particular of a connecting rod which has been twisted several turns and then given a 180-degree bend flat upon itself. This is a cold bending test such as has only been made possible by scientific heat treatment of the metal during the processes of manufacture.

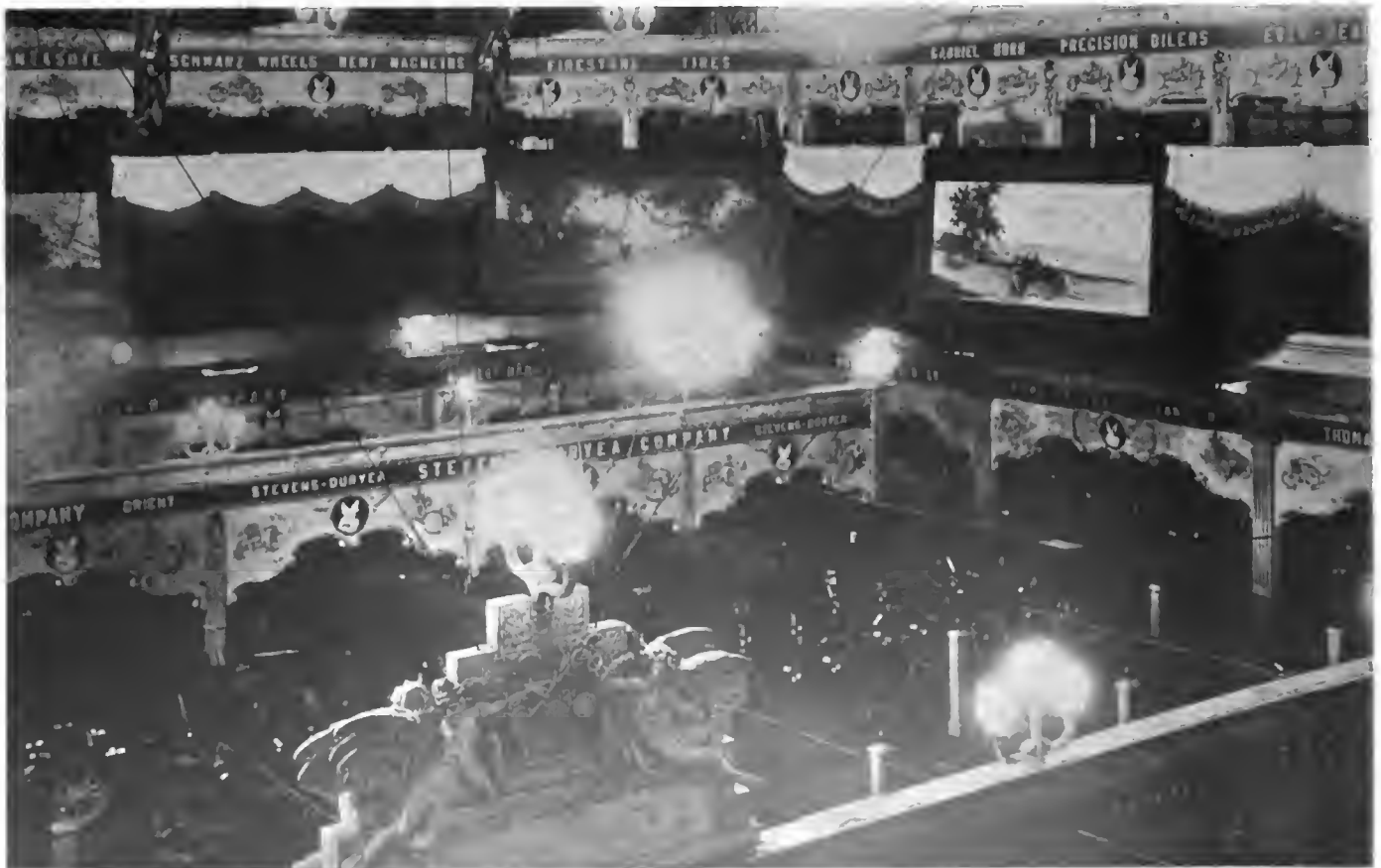
Baldwin Chain & Manufacturing Company, Worcester, Mass.—One of the chief features of the exhibit of this concern is the 1907 model of the Baldwin Spring Recoil Check, which is designed to permit free compression of the springs under any conditions of running, but which gradually absorbs

A Fine Line of Distance and Speed Recorders.—It is putting it mildly to say that the line of distance and speed recorders uncovered by the Auto Improvement Company, an offshoot of the American Electrical Novelty Company, 16 Hudson Street, New York, forms one of the sensations of the show where these instruments are concerned. This firm has taken advantage of the demand that has long been apparent for an instrument to suit the needs of the tourist whose car seldom reaches or exceeds 40 miles an hour. To such autoists the speed range from 50 to 75 miles is a useless superfluity that must nevertheless be paid for. They have accordingly brought out the "Ever Ready Tourometer" with a speed range from zero to 50 miles an hour, combining with it a trip odometer reading to 999 miles and repeat, and a season mileage recorder to 9,999 miles. The case is of solid bronze and is dust and waterproof, the dial being of aluminum with black figures, making it easily readable at a distance. The gears, flexible shafting and mechanism are the same as on the expensive instruments. Complete it sells for \$35.

Its next larger brother is the "Ever Ready Roadster" and reads to 65 miles. The instrument is much larger and both the trip and season odometers run to 9,999 miles before repeating. This is a



YARDS OF RED AND WHITE BUNTING HANG FROM THE GIRDERS, AND FLAGS GIVE A PATRIOTIC TINGE TO THE DECORATIONS.



ACCESSORIES FIRMS WERE WELL PLACED IN THE GALLERY OF THE COLISEUM AND HAD LIGHT AND VENTILATION.

racing model, particular pains being taken to make it accurate at all speeds and it will be calibrated up to 135 miles per hour if desired. The odometer indications are recorded by a new principle, the index showing on plain engraved rollers in black numbers, with fractions in red. Every revolution of the wheel is recorded whether going ahead or backing. Complete with gears, brackets and flexible shafting, the "Roadster" sells at \$50.

For the autoist who wishes to limit the number of ornaments on the dash of his car, there is the "Ever Ready Universal" or "all in one" model. This is the same instrument as the "Roadster" with the addition of a clock, though the complete combination is scarcely larger than its compeers who are without this valuable feature. This is a combined speed, distance and time recorder par excellence. Complete it sells at \$60.

Another noticeable specialty offered by these makers is the "Ever Ready" Standard Vulcanizer. It is a complete tire repairing plant in a compact, self-contained form. Equipped with a combination of tools, each particularly designed for a special purpose, it is fitted to repair shoes and inner tubes, blow-outs, rim cuts and retreading or make good any damage to canvas or rubber. Punctures, blow-outs and reseating valves are also naturally within its province. Besides this there is the "Ever Ready" car vulcanizer and the "Ever Ready" tire tool which are specialties made by this firm.

Limousine Carriage Manufacturing Company, Chicago.—The Schildback and Beecher divided wind shields are the specialties manufactured by this firm, upon which they lay special stress in their exhibit. A patent has been applied for on the former, its construction being such as to entirely do away with hinges, which constitute one of the most annoying features of the ordinary style of shield. In this new form, the upper half is held perpendicular to the lower by a tapered pin fitting into a corresponding recess in the top of the lower half and is further stiffened by a brace running from a slide on the lower rigid brace. The upper half is lowered by loosening two set-screws and has the great advantage of coming down parallel with the lower half, thus making it easy to use no matter how close it may be to the steering wheel. Beside this, in lowering it, the top of the upper shield comes down level with the top of the lower side, which is an unusually attractive feature, as regardless of the position of the shield, the appearance it makes on the car and the view of the driver remains the same. The bolts turning in the slides running on the forward braces are fitted with long nuts with wheels on their ends, working the same as a loose washer, thus allowing the upper frame to be held at any angle of the circle, which has the advantage of permitting the shield to be lowered just sufficient to clear the dash lamps.

Hancock Manufacturing Company, 144 East Erie Street, Chicago.—Under the head of "Points Worth Noticing," the makers of the Hancock "Valveless" oiler call attention to the many things in which their system of oiling is designed to give satisfaction to the autoist by its simplicity and reliability. It is so much a matter of common knowledge even to the mechanically uninitiated that bearings, slides and all other moving parts, whether small or large, and they must of necessity be small in an oiler, are things that require constant attention to keep them working properly. Otherwise there is going to be trouble—hence, the "valvelessness" of the Hancock, and hence its advantages, of which this is the chief. Supplying lubricating oil on the "feast and famine" principle is what sends so much valuable machinery to the scrap heap in such a remarkably short time, and nothing sooner than a high speed auto motor; oil must be fed faster as the speed increases, and stop when the motor does, otherwise there is a lack of lubrication and a waste of oil, or, incidentally, a needlessly smoky exhaust.

Acetyvone Company, 38 Park Row, New York.—One of the greatest difficulties encountered in the generation of acetylene gas, particularly on the small scale necessary on a car, is that of after generation. It is next to impossible to shut the generator off, it continues to make gas whether the lamps are burning or not, once the water has been turned on. This causes a large accumulation of gas with the risk of explosion or wastes the carbide, as a new charge is necessary every time the lamps are required. To overcome this the Acetyvone Company has brought out a special stick carbide made by a secret process which is used in an ingenious generator. These sticks are about one inch in diameter by four inches long and fit into sockets in which they slide freely, the size of the generator being increased by adding to the number of sockets, the types now being their moving around from the jolting of the car. The lower part of the generator is filled with water to a certain line, and is prevented from splashing by a series of baffle plates. Into this water the sticks dip at their lower extremities and feed by gravity, the retaining sockets and adjustments preventing their moving around from the jolting of the car. The lower ends of these sockets or tubes may be instantly closed by moving a small lever on the top of the generator, which raises a plate carrying a rubber gasket, thus hermetically sealing the seak in the containing tube and preventing any after generation. The device on the whole is so simple that the manufacturer's only caution is, "Keep it clean," and this is easy, as there are so few parts. Probably its greatest advantage lies in the fact that the special stick carbide is not so susceptible to moisture as the ordinary carbide, though its affinity for water has not been impaired by the process it undergoes in manufacture.

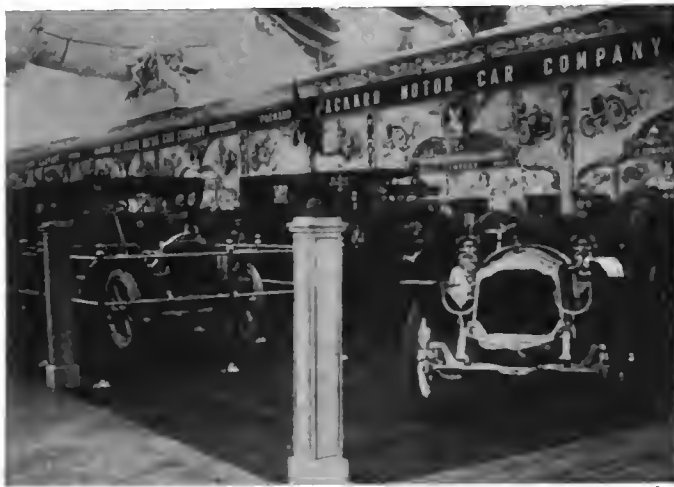
National Oil Pump & Tank Company, Dayton, O.—The problem of the safe handling of gasoline for whatever purpose this inflammable fluid may be used has been made a study by this concern, and they have evolved a line of convenient apparatus for the autoist as well as for the garage-keeper, regardless of how much or how little fuel he is permitted to keep on his premises. Their lines consist in the main of the National self-measuring, registering and computing tank outfits and long distance storage outfits in all capacities. The pumps are of the combined suction and force type, built entirely of brass, steel and malleable steel castings. They are equipped with hand-ground anti-drip discharge cocks and lever shut-offs, absolutely preventing any loss from evaporation, while the discharge register tallies the gallons and half gallons exactly as pumped. Every pump is equipped with a special locking device embodied in the casing, only the key post being visible. They also specialize on outdoor cabinets, fire-proof cabinets, runabout tanks, and other forms of metal reservoirs.

Wray Pump & Register Company, Rochester, N. Y.—This firm has recently branched out into another line than that of making pumps and pressure indicators, for which they always have been known, by undertaking the manufacture of the Lindsay timer and distributor, a device which has many claims to merit. It is designed to be attached to the dash and is protected by a bell glass covering which permits of its operation being readily followed at all times. The battery wire enters from beneath, passing through a bridge support, and is connected to an adjustable spring plunger, making a wipe contact on the arms of a starwheel; at the same time the secondary current enters at the right through a similar connection and makes contact with a bronze ring recessed on the under side of a fiber turntable carrying the starwheel.

(Continued on page 297)

THE SHOW FROM VARIOUS STANDPOINTS

Fisk Rubber Company, Chicopee Falls, Mass.—It is evident that the men who make the Fisk tires have not been sleeping where the matter of dismountable rims is concerned, and they have brought their surprise with them to the Windy City. It is something that makes a man who thinks he knows all about dismountable rims open his eyes and take a second look and then ask to see the works. There are the usual nuts visible that have always characterized the form of mechanically fastened tire to which this house has so long and consistently devoted its energies, but the sophisticated tire user begins to marvel when he sees that these are not to be removed as usual. The demonstrator gives them a twist or two and, without going further, proceeds to lift the tire from the rim. This is where the surprise comes in, and unless the looker-on is familiar with mechanics, the very simplicity of the device is what most puzzles him. He cannot see just what keeps the tire on or what permits it to come off again,



AN ATTRACTIVE CORNER IN PACKARDS.

though there is no doubt in his mind that it is there to stay when he tries to move it after the nut has been tightened. Its secret lies in the employment of a simple split ring with a beveled inner face in contact with a similar face on the rim proper. When the nuts are tightened the face of the ring is forced to slide on that of the rim, and in consequence it rises vertically, thus gripping the tire at its strongest point with a hold that nothing should be able to shake loose.

A Bay Window Limousine.—As in Gotham, the Isotta Fraschini "bridal car" was the cynosure of all eyes, and in addition the Hamilton Automobile Company's showing of imported cars included a very novel and attractive body by Kimball, which was rather out of the ordinary. In place of the conventional side windows they were given a slight bow, somewhat on the order of a bay window, enabling the passengers to see ahead. Every convenience and comfort that the art and ingenuity of the carriage builder could suggest was incorporated in its interior furnishing, including adjustable footrests, extra folding seats that disappeared in the side of the car when not wanted, and a multitude of other small luxuries that are now considered a necessary part of the interior finish of the up-to-date car. Small bevel plate glass mirrors mounted in polished frames are also set on the front stanchions of the hood to enable the driver to see to the rear when running under crowded traffic conditions.

Mr. Hotchkin's Teddy Bear Attracts Notice.—Probably the most congested part of the entire show was to be found at a point on one of the aisles in the Coliseum Annex. There was always an interested crowd there, and the casual visitor found it difficult to get near enough to find out what the center of attraction consisted of. When he finally did succeed in worming his way through, if he did not get an inkling of what was going on by seeing a monster Teddy Bear mount ceilingward over the heads of the spectators before he got within the charmed circle, a sight of one of the cleverest exhibition "stunts" ever put on to show the merits of a shock absorbing device rewarded his efforts. P. M. Hotchkin, maker of the well-known Hotchkin "anti-jolt" device, conceived the idea of showing in a simple and impressive manner just how his invention really does away with the shocks and jars instead of merely absorbing them. He has rigged up a seat after the fashion of one of the bucket seats of an



AN "INDEPENDENT" WHO WAS WELL PLACED.

auto, mounted on springs of the regulation type, and devised in such a manner that the occupant may receive the benefit of the anti-jolt device or not as the demonstrator wishes. The springs are compressed by means of a long lever, and when the anti-jolt is "not on the job," as some of the admiring gamins expressed it, the bear soars the moment they are released, and falls back with a thud, sometimes losing his passage altogether by being thrown out of his seat, which would often be the case with the passengers in a car were it not for the high sides of the tonneau. Then the operator compresses the springs till they almost touch, and suddenly releases them with the device working; the result is a slow, easy and almost imperceptible reaction, which brings Mr. Bear up comfortably without in the least disturbing his equilibrium or unsettling his center of gravity. "In one case he never knew what struck him, and in the second, he never knew it happened," as an amused spectator put it. Mr. Hotchkin's bear is certainly the "sight of the show."

Frank P. Illsley, Chicago, Stevens-Duryea Agent, was a thoughtful man in providing fur coats and caps for those who sought demonstration rides in the big and little "Sixes." Autoing in typical Chicago weather, such as seems to be on tap this week, is far from comfortable, and a warm-clad man is a more probable customer than one half frozen. Doubtless Mr. Illsley has reaped the reward of his thoughtfulness.



WHERE THE BIG AND LITTLE "SIXES" WERE SHOWN.



THE NEW PEERLESS OF DESIGNER SCHMIDT.

Edgar Apperson on Long-Distance Racing.—It will be remembered that the Apperson Brothers built a fast car for the American Elimination Trial of the Vanderbilt Cup. In the preliminary practice, driven by George Robertson, the car showed most encouraging speed, but one morning a flat tire brought about the accident which temporarily ended the career of the Apperson candidate. Commenting upon the worth of automobile competition, Edgar Apperson expressed himself in this vein: "If the Racing Board of the A. A. A. established a long-distance contest of anywhere from 700 to 1,000 miles, calling for stock chassis, we would certainly be an entrant. Undoubtedly it would be necessary to occupy two or more days, place the cars in the hands of the Racing Board at night, and only permit the driver and his mechanic to work on them, and then during the hours of the race itself. In order to make positive that stock chassis only would be used, it might be necessary for the Racing Board to send a representative to the factories of the entrants and there stamp in such manner as to make substitution impossible the chassis to be used in the race. It would seem to me that 2,500 pounds would be a fair weight limit for the chassis, which, of course, would be something in excess of a present total weight of 2,204 pounds for the machine as it comes to that starting line. It is my belief that a race of this character would be beneficial to all concerned, and I am not sure but that a limit might be placed on the total piston displacement, giving the builder the option of distributing the cubic inches in as many cylinders as he might desire."

An Old English Mail Coach.—Speaking of bodies there was nothing that quite equalled in attractiveness the old English mail coach body shown on an Apperson chassis by the Kimball Company. With its quaint round lines and old-fashioned coloring it was a novelty such as has seldom been seen on pneumatic tires. Every detail of the old-time conveyance, so oddly named a "Diligence," and one so familiar a sight on English roads, has been reproduced here, and all the lines of the ancient and of the most modern vehicle have been blended artistically into a harmonious entity that is a delight to the eye. With its small square panes in the windows of the coach and its old-time booths behind, it is the typical application of the standard of the Eighteenth century to the form of locomotion of the Twentieth.

A New High-Tension Magneto.—Some of the ignition wise found something to interest them after having made the rounds and taken a close look at the cars. "That's a brand new magneto. I haven't seen that one before. Wonder who makes it? It certainly looks good." Investigation showed it to be the product of the Splitdorf Laboratory in the shape of a high-tension magneto on the Triumph car, and it has also been decided upon as a part of the standard equipment of the Thomas among others. It is the result of several years' hard study and extended tests on the part of a man who has made the building of electrical apparatus a life study, so that he knows it is right.



A PIONEER THAT HOLDS ITS OWN.



WAYNES AND STUDEBAKERS WERE NEIGHBORS.



THE BIG STEARN'S AND TWO-CYCLE ELMORE.

A Reminiscence of the Vanderbilt.—Merely for the asking, the visitor could obtain a section of the Vanderbilt race at the Pantasote booth, and in a form to mail to his friends to show just how the race looked when he was there. It takes the form of a post card to which is attached a moving picture annex depicting Lancia and his Fiat flight around Krug's corner when it was merely a matter of fractions of a minute whether he or Wagner would cross the line first in the matter of elapsed time.

A Novel Advertising Stunt.—No matter where the spectator looked he saw "Fisk Tires Carry All." At very turn and on every hand, or, more properly speaking, in every hand, for the Fisk publicity creator had taken heed of the philosophers and made it his business to make others work

for him and spread the tidings of Fisk tires broadcast. Every man, woman and boy of the genus catalogue fiend carried Fisk tires—not the tires themselves—something that told the tale quicker—a Fisk carryall into which to shove the gathering of many a round of the car and accessory stands in both the buildings.

Pardee & Canary, 1218 Michigan Avenue, Chicago, have just taken on the agency for the well-known Renault cars, as representatives of Paul Lacroix, of the Renault Frères Selling Agency, New York, and are making an attractive exhibit of the line in the First Regiment Armory, where all the imported cars are housed for the week. In connection with their other agencies, which include that of the American Mors, the American, Babcock electrics, and others, this firm has an unusually complete showing.

The Ford Fire.—Fire unceremoniously brought the Ford Motor Company's private exhibit, which was being held at the local agency at 1444 Michigan avenue, to a sudden and unpremeditated close but a few hours after midnight of Sunday. But almost before the fire department was through its work cooling the ruins that represented about \$50,000 worth of new Fords, both of the six and four-cylinder types, which had gone up in smoke, Manager Hay had made his plans to continue the show. He at once engaged new quarters in the furniture exposition building at Fourteenth street and Wabash avenue and rushed the cars that had been saved from the fire around to the new address, at the same time wiring the factory to forward all that could be spared by express. The doors were opened on the new agency rooms and the show at noon to-day. Immediately upon learning of the fire, Ralph Temple, president of the Automobile Dealers' Association, offered Mr. Hay the use of half his establishment at 309 Michigan avenue, but the latter thought it best to obtain the Wabash-avenue quarters.

AN OFT-ASKED QUESTION WHICH ELICITS MANY ANSWERS, MANY OF WHICH MIGHT BE CORRECT.—McCutcheon in *Chicago Sunday Tribune*.



IMPORTANCE OF STRENGTH IN SIDE FRAMES

By THOS. J. PAY, E. E.

OF these important members in automobiles, while much has been said, there is yet some room for discussion, particularly in view of the decided tendency to resort to the use of alloy steel on account of its great strength and consequent rigidity. While it is true the strength of alloy steel is very great in comparison with sheet steel, as ordinarily procurable upon the open market, even so, the fact remains that the finer grades of flange



FIG. 1.—C-46-O Krupp steel chassis frame cross member. Closed on itself without showing cracks. Under shock test this steel deformed 3.03" after the fifth blow under standard conditions and the "proof" was then bent double, without showing cracks.

steel are worthy of serious consideration, possessing as they do not only a fairly satisfactory tensile value, but other desirable properties to a marked extent. Alloy steel, on the other hand, possesses the highest tensile values, but its performance in some respects may not be so good, and what is gained in one way may be lost in another; hence to discuss the matter, with a view to clearing up some of these points, will be the main object here.

Mild Steel Not a Suitable Material.

From time to time, as opportunity afforded, the writer has tried out, in actual service, chassis frame members of mild steel, specification flange steel and chrome nickel steel, but in fairness to nickel steel it may be proper to say this product has been given no trial such as would lead to any adequate conclusion. Of mild steel, such as the market readily affords, it must be confessed it is a product of no good promise, nor can its use be recommended, primarily because it "wilts" on small provocation, and, again, because in flanging this product develops cracks all along the turned edges. True, the cracks are not always so well defined as to be readily noticeable, but, as a rule, the imperfections developed by flanging are easily seen through a 20-to-1 magnifying glass. There is no reason why mild steel could not be made to flange perfectly flat; reference is here made to the products usually found upon the open market—products indeed that positively will not stand bending 180 degrees and flattening down, nor will such products, as a rule, stand wrapping around a mandrel of even a diameter of double the thickness of the sheets.

Of course, by flanging "hot" it is sometimes possible to avoid the surface imperfections complained of, but not always, for in some cases the metal in question behaves badly when heated, and it is feared the commercial product usually obtainable is so inferior in its composition as to render it unsafe for use, hot or cold flanged, on the ground that imperfections are likely to develop during the flanging operations, no matter how the operation may be conducted. In any case, such products are not strong, and if chassis frame members are to be light they must be of steel, of a grade affording strength in excess of that likely to

obtain in inferior grades of steel plate, such as may be good enough for many ordinary purposes, and for which the ordinary commercial product is carried in stock by steel vendors.

It is no impropriety to manufacture and sell such steel; moreover it is very low priced, and, besides, it is absolutely good for the many uses to which it is put, outside of automobile work, but a light machinery platform, such as the chassis frame of a motor car happens to be, can scarcely serve under the usual road conditions, and prove rigid enough for the work, unless in a very light car, as a runabout within 1,000 pounds, holding a motor of very low power, and a single chain drive, by means of which the ills resulting from a chassis frame of no great rigidity would be negligible in any case.

Steel of this character, as the following analysis will show, is far from pure, and can lay no claim to quality at all. Chemical composition of ordinary sheet steel, sometimes used for chassis frames:

Carbon	Silicon	Sulphur	Phosphorus	Manganese
.20 to .30	.18 to .28	.06 to .08	.08 to .10	.40 to .50

giving the range of each component in per cent. As will be observed, the sulphur and phosphorus components are very high in both cases, and since sulphur renders steel "hot short," this product would prove troublesome if flanged hot, whereas, on the other hand, the high phosphorus component would not interfere with cold pressing, because phosphorus renders steel "cold short."

Tests Do Not Reveal Weakness of Such Material.

Any conventional physical test for tensile strength, elastic limit, elongation, or reduction of area, likely to be made, would scarcely prove the real lack of value in motor car work of this product, because the physical properties as usually taken do not show the ills of sulphur and phosphorus, although the elongation might develop a value low enough to put the steel under suspicion. The best and quickest way to illustrate the inferiority of such steel is to subject a "proof" to a 180 degrees bending test, around a mandrel equal to the thickness of the "proof," and if cracks show up no further effort to show lack of desired qualities will be necessary. Much space could be taken by way of explaining the ills likely to follow the use of any such steel in chassis frames, but most autoists of any experience at all have come across "wilted" and deformed side members, while a goodly number of autoists have had to pay dearly for the right to use this steel. Considering carbon steel further is to take up with flange steel or boiler plates, of which, to be sure, there are several



FIG. 2.—C-46-O Krupp chassis frame steel deformed to show extent of bending without showing cracks. Under a compression test this steel showed set when subjected to 85,296 pounds per square inch.



FIG. 3.—C-46-O Krupp steel chassis frame cross member. Flattened down under the hammer with no sign of cracking.

grades, but the most inferior grades of boiler plates are vastly superior to the commercial steel plate, previously referred to, and for the matter of that, "structural steel," as rolled into shapes, is a superior product in comparison.

The characteristics and composition of the products of these classes that can be obtained will be set down below for comparison and discussion.

Structural Steel—Acid Open Hearth.—Chemical composition:

Carbon	Silicon	Sulphur	Phosphorus	Manganese
.20	.20	.06	.08	.40

Physical properties:

T. S.	Y. P.	El.-8°	Cold Bend
50,000 to 60,000	30,000	26%	180° flat on itself

Structural Steel—Basic Open Hearth.—Chemical composition:

Carbon	Silicon	Sulphur	Phosphorus	Manganese
.20	.20	.06	.06	.40

Physical properties:

T. S.	Y. P.	El.-8°	Cold Bend
52,000 to 62,000	32,000	25%	180° flat on itself

Both of the above products, while much finer than ordinary steel plate, are by a considerable margin below boiler plate in real qualities.

Boiler Plate—Open Hearth.—Chemical composition:

Carbon	Silicon	Sulphur	Phosphorus	Manganese
.20	.15	.05	.06	.30 to .60

Physical properties:

T. S.	Y. P.	El.-8°	Cold Bend
55,000 to 65,000	33,000	25%	180° flat on itself without sign of fracture.

Fire Box Steel—Open Hearth.—Chemical composition:

Carbon	Silicon	Sulphur	Phosphorus	Manganese
.20	.18	.04	.04	.30 to .50

This chemical composition is very much better than any previously recorded.

Physical properties:

T. S.	Y. P.	El.-8°	Cold Bend Test
52,000 to 62,000	32,000	26%	180° flat on itself

While the physical properties are somewhat different for fire-box steel than for boiler plate, yet even so the lower phosphorus and sulphur marks this steel as vastly to be preferred for chassis frame members because of the decidedly more reliable qualities of the steel, especially in the flanging process, and as a result of flanging, even not taking into account the superior ability of this steel to withstand shock loads.

Splice Bar Steel—Open Hearth or Bessemer.—Chemical composition:

Carbon	Silicon	Sulphur	Phosphorus	Manganese
.15	.18	.08	.10	.30 to .60

This is an analysis of a strictly inferior product.

Physical properties:

T. S.	Y. P.	El.	Cold Bend Test
54,000 to 64,000	32,000	25	180° flat on itself without fracture.

This product, as a general rule, fails on the cold bending test, and, on the whole, it may be said this steel is scarcely better than the product readily afforded on the open market.

Rivet steel is rather attractive for use in what might be termed a medium good chassis frame stock, the qualities of which could be set down as follows:

Rivet Steel—Acid Open Hearth.—Chemical composition:

Carbon	Silicon	Sulphur	Phosphorus	Manganese
.08	.06	.06	.06	.80

Physical properties:

T. S.	Y. P.	El.-8°	Cold Bend Test
56,000 to 62,720	35,000	25%	180° flat on itself, both hot and cold, without cracking.

The basic open hearth steel of this grade would have the phosphorus down to .04 instead of .06 as above, considering steel as usually manufactured.

The carbon steel thus far taken into account is all such as would stand a cold bending test of the maximum desired, but these products are not of what would be called great strength. A carbon steel product to show great strength might properly be termed spring steel, a grade of which is as follows:

Spring Steel.—Chemical composition:

Carbon	Silicon	Sulphur	Phosphorus	Manganese
.50	.12	.035	.035	.80

Physical properties—normal.

T. S.	Y. P.	El.-8°	Cold Bending Test
100,000 to 110,000	40,000	23%	45° around mandrel equal to thickness of plate, hot and cold, with no sign of cracks.

This steel would, of course, be quite rigid, and should serve for chassis frames quite well, but the danger of damaging the micro-structure during the heating process would be something to take into account, and, besides, the plates would have to be annealed after bending to render them reliable.

Characteristics of Some Alloy Steels.

So much for carbon steel, unless to testify to the effect that "fire-box steel" has been used in some of the best "American cars" with entire satisfaction, will be of benefit in clearing up the whole situation. Of the alloy steel products, nickel steel and chrome nickel steel are about all that have been given a trial at length, and of these genera of steel, the writer's experience has been almost wholly confined to chrome nickel steel.

Of chrome nickel steel, one brand used by the writer for chassis frame members holds in its chemical composition the following:

Chromium	Nickel	Carbon	Silicon	Sulphur	Phosphorus	Manganese
1.40	3.30	.31	.20	.028	.012	.41

showing very low phosphorus and other evidences of fine quality. This steel in normal bars—not rolled into plates—generally tests about as follows:

Physical properties—normal.

T. S.	Y. P.	El.-2°	Con.
110,000 to 120,000	90,000 to 100,000	24%	42%



FIG. 4.—C-46-O Krupp steel chassis frame cross member. Test by hydraulic pressure on a ring showed 33.5% widening without sign of physical imperfections.

On the cold bending test, using plates 4 mm. thick, they usually will bend 180 degrees on a mandrel of a diameter equal to the plate thickness without showing cracks, but the plates will not, as a rule, stand 180° and flattening down. This product, when rolled into plates 4 mm. thick, is of very great strength, especially after undergoing heat treatment; indeed, the test, as follows, is a very reasonable expectation:

Physical properties—treated.

T. S.	Y. P.	El.-2°	Con.
150,000 to 160,000	128,000 to 135,000	16%	38%

This material was introduced in the chassis frame of the B-L-M racing car, and is regularly employed in B-L-M touring cars at the present time. It is also being put into the new Ellsworth cars, as the regular chassis frame product. There is still another grade of chrome nickel steel, differing in chemical composition, that has not been regularly adopted for chassis frame work, although it should serve quite well, the composition being as follows:

Chemical composition:

Chromium	Nickel	Carbon	Silicon	Sulphur	Phosphorus	Manganese
4.41	1.60	.25	.20	.013	.012	.35

This product is especially low in sulphur and phosphorus, and runs high in nickel and chromium.

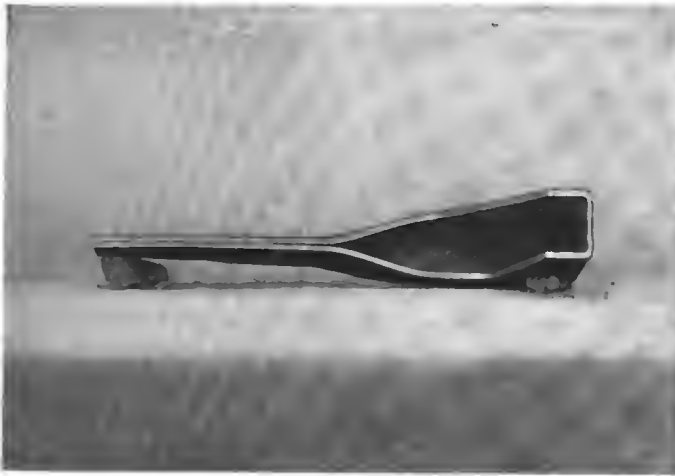


FIG. 5.—C-46-O Krupp steel chassis frame cross member. Physical properties: T. S., 114,645; E. L., 93,167; Ex-2°, 17%; cold bending test, 180° and flatten down without sign of fracture.

Physical properties—normal.

T. S.	Y. P.	El.-2°	Con.
123,000 to 130,000	118,000 to 112,000	28%	64%

and when treated the reasonable expectation might be put down as follows:

Physical properties—treated.

T. S.	Y. P.	El.-2°	Con.
180,000 to 190,000	155,000 to 165,000	14%	48%

In flanging, this metal in the normal state will stand 180° and hammering down flat with no sign of fracture. The only reason for not using it is the fact that it is difficult to procure, excepting in round bars, whereas for chassis frames it is wanted in flat sheets about 3-16-inch thick, 9 inches wide and 12 feet long. It will be noted that alloy steel is far more pure than carbon steel, and it is due in a large measure to low sulphur and phosphorus that alloy steel performs so much better under shock loads. On the other hand, the pressure of chromium with nickel accounts not only for the great increase in tensile strength, but the near approach of the elastic limit to the tensile strength.

Tests of Some Foreign Alloy Steels.

In France, nickel steel for structural shapes as chassis frames may be had with very high nickel and extraordinary strength. One grade has nickel between 10 and 12 per cent. with physical properties as follows:

T. S.	Y. P.	El.-2°	Con.
100,000	114,000	12%	.....

This shows by the comparatively low elastic limit, the absence of chromium; but the high tensile strength would, of course, afford great initial rigidity.

Another French nickel-steel product for chassis frames with 3 1-2 per cent. nickel, tests as follows:

T. S.	Y. P.	El.-2°	Con.
71,000	50,000	28%	.....

This product should prove quite reliable for light-weight cars, but it does not compare with chrome nickel steel.

The illustrations are reproduced to show the extent to which fine grades of steel can be deformed, without showing signs of fracture, and it is believed side frame stock, to be thoroughly good, should be capable of withstanding the 180° bending test.

NITROGEN FOR TIRE INFLATION.

FROM THE ENGLISH MECHANIC.

It has probably not occurred to many users of pneumatic tires that some of the trouble experienced in their use could be obviated if some other elastic fluid were substituted for atmospheric air in their inflation. Of course, experiments have been made with carbonic acid gas stored in the liquid state, and with engine exhaust products collected in a storage tank; but the object of these experiments was rather to reduce the labor of inflation than to improve the action of the elastic fluid in the tires. There is no very great difference between the degree of elasticity of the different gases, and no appreciable advantage is likely to be realized in this respect; but there are two other properties of gases which affect their suitability for use in pneumatic tires, namely, their penetration and their chemical or erosive action on rubber. For instance, it was found that it was absolutely impossible to keep the tires inflated with carbonic acid gas, the gas escaping rapidly through the infinitesimal pores of the rubber. The use of exhaust gases is generally not regarded favorably, because it is known that the vapor contains a certain amount of lubricating oil, and this has a solvent effect on rubber. Atmospheric air is generally regarded as neutral, yet it is known that its oxygen constituent has an oxidizing or ageing effect on rubber, which results in a complete change in its physical properties, rendering it hard and brittle, and very liable to crack. It does not appear to be definitely known whether this effect is due to changes in the rubber or in the sulphur incorporated in it to effect its vulcanization; but there seems to be no doubt that oxygen, the active element of the atmosphere, is responsible for these changes. Following out this line of reasoning, some experiments have been made in France (according to an article by Francis Marre in *Cosmos*) with a view to utilizing the neutral or chemically-inactive element of the atmosphere, nitrogen. According to this writer, the use of nitrogen for this purpose has even reached a commercial stage in France, it being possible to purchase steel bottles containing nitrogen under pressure, which it is only necessary to connect to the tire valves in order to inflate the tires to the desired pressure automatically. When it is considered that atmospheric air is omnipresent and free, the commercial success of nitrogen for this purpose is somewhat doubtful.

SOLID OXYGEN FOR CARBURETER USE.

Oxylithe is oxygen in a latent state—in a solid body that can be treated cold by the simple action of water, in the same way as acetylene gas is produced by the action of water on calcium carbide, but without any of the danger or objectionable smells which accompany the latter. When water comes in contact with oxylithe, oxygen is immediately given off violently; when the water is withdrawn, the generating process stops at once. One pound of oxylithe will, it is said, generate about three cubic feet of chemically pure oxygen; it, therefore, follows that a very large quantity of oxygen gas represents only a very small bulk in the solid. The oxygen only exists in a latent state, and is not generated until actually required. The process therefore dispenses with the use of cylinders of compressed oxygen, and opens up a fresh field in motor carburation research.

TWO AND FOUR-CYCLE TYPES COMPARED

FROM SIBLEY JOURNAL OF ENGINEERING.

FROM 1874 to 1886 the Gas Motoren Fabrik Deutz monopolized construction of four-cycle engines, under protection of German patent No. 532. After a legal fight, lasting nearly four years, and going on at the same time in Germany, Austria, England, Belgium, France and Italy, the scope of the patent was considerably reduced, claim No. 4, covering the four-cycle principle, the especial bone of contention, being vacated. In the meantime, under the force of circumstances, the other manufacturers were compelled to develop the two-cycle engine, and there is no doubt that if the state of affairs as outlined had continued to the end of the patent, the two-cycle engine would have reached its present development much earlier. The very fact, however, that the two-cycle principle in its infancy offered numerous and serious difficulties, made the legal fight protracted and bitter, the pamphlet of Beau de Rochas, of 1862, being a very effective weapon against the validity of claim No. 4. The natural result of the vacation of this claim in 1886 was that the two-cycle machine almost disappeared from the market for nearly ten years, and has found its present development within the last six to eight years.

As stated at the outset, the question of choice between the four-cycle and the two-cycle machine as regards economy, operation and maintenance, is not at all decided, although it must be admitted that the decision commences to lean more and more strongly in favor of the two-cycle. Guldner, especially, to whom we shall be indebted for a great deal of what follows, decides very strongly in favor of the two-cycle machine. Other authorities are not so decided. There is a great deal that may be said for and against each type on both theoretical and practical grounds. Before comparing the two methods as to efficiency, it will be well to outline the conditions attending each.

The two types are thermodynamically equal as far as the combustion of the charge, whether at constant volume, or constant pressure, and their expansion strokes are concerned. They differ only in their method of displacing the old and taking in the new charge, *i. e.*, in their scavenging and loading.

In the four-cycle machine the scavenging is done by the power piston pushing out the burned gases through the exhaust port. This is followed by the suction stroke, during which the new charge is taken in. The compression stroke, combustion, and expansion stroke following complete the cycle. The piston therefore works half the time as a power piston, and the remainder of the time as a pump piston.

In the two-cycle machine the scavenging and loading are done in various ways. In the first place we may distinguish two scavenging agents; the fuel mixture and air alone. Further, the scavenging agent is introduced into the cylinder by pumps in various ways. Among these we may distinguish three types: the enclosed crankcase employed as a pump, the front end of the cylinder employed as a pump, and a pump entirely independent of crankcase or power cylinder. A further modification comes in when any of the above types of pumps are used with or without an air receiver. Several methods of scavenging are also employed. The fuel mixture alone may be used to drive out the exhaust gases, or little air may be sent into the cylinder ahead of the fresh gas, or, finally, the scavenging may be done by an excess of air, followed by the admission of fuel mixture when the scavenging is complete. How these various methods compare among themselves, and with the four-cycle, will be seen later on.

The final judgment upon the success or non-success of an engine should always be based upon the thermal efficiency of the machine at the crankshaft, and upon the mechanical efficiency. Of the power generated during the working strokes of the cycles a part is lost in the fluid friction of the machine, and in the rubbing friction of the various machine parts. The fluid friction in

a four-cycle machine will be understood to mean the pump work as indicated by the bottom loops of the indicator cards. In careful testing these loops should always be taken with a weak spring, in order to determine the pump work with more accuracy. This is especially desirable since little data exists on this point. Should the four-cycle engine be of the positive scavenger type, as the 500-horsepower Premier, reported upon by Humphrey in 1900, this pump work should be added to the fluid friction of the bottom loops. In a two-cycle engine the fluid friction is the pump work done by the fuel and air pumps. The rubbing friction of the machine need not be further defined.

It seems that engineers are not quite unanimous in their methods of computing mechanical efficiency, as the writer had occasion to notice lately in looking over some tests. If from the total indicated horsepower we subtract the fluid friction, in either type of engine, we shall obtain the net indicated horsepower. The mechanical efficiency is, according to some,

$$E = \frac{\text{B. H. P.}}{\text{total I. H. P.}}$$

according to others

$$E = \frac{\text{B. H. P.}}{\text{net I. H. P.}}$$

Guldner consistently employs formula 2, which gives a higher result than formula 1, and takes pains to correct Thurston's figures on a Brayton gas engine computed according to 1. It seems to the writer that the use of formula 2 is justified only when the work of the air pump is to a great extent recovered in the power cylinder, as is the case in a Brayton engine, or in the Diesel. When the air compressed by the pump is, however, used for scavenging only, blowing through the power cylinder when the exhaust port is open, this is not the case, and for such engines, the majority of two-cycle engines, it seems nearer right to use formula 1. Similarly the thermal efficiency at the brake should be:

$$E = \frac{\text{Thermal equivalent of B. H. P.}}{\text{Thermal Units in Fuel supplied.}}$$

A complete comparison of the four-cycle and two-cycle principles should include the following heads:

- I. Thermodynamic actions in the cylinder.
- II. Fluid friction.
- III. Friction of machine.
- IV. Limitations of construction and economic considerations.

TREND OF THE FRENCH MOTOR INDUSTRY.

FROM ENGINEERING.

An interesting fact to be learned is the increasing attention which is being given to automobile construction by the large French metallurgical works, including Messrs. Schneider, the Forges de Douai, and others. Of late years the process of manufacture of chassis has greatly improved, and much attention has been paid to the production of the right quality of steel for the purpose, the first-named works having dealt more especially with the problem and from a scientific standpoint. The French motor car builders manufacture the motors in their own shops, and fit them out complete, together with the whole of the gear; but they are gradually ordering the chassis and the axles more and more from independent French metallurgical works; the plans and technical conditions, however, are drawn up by the car builders.

Alloys of lead, tin, and bismuth show strange properties. Bismuth two parts, and lead and tin one part each, melts at temperature below the boiling point and expands on cooling.

LETTERS INTERESTING AND INSTRUCTIVE

A Corrector Corrected.

Editor THE AUTOMOBILE:

[562.]—I was much interested in letter No. 536, by J. Francis Booream, published in "The Automobile" for January 17, and criticising your answer to Wallace Long's question, No. 497, published in the issue of December 13. Personally I cannot find the fault Mr. Booream seems to find with your answer, and I am wondering if his comments have escaped your detailed analysis. Or is it possible that you now agree with Mr. Booream?

Litchfield, Ill.

HIRAM LEWIS.

Mr. Booream's arguments seem to us quite as erroneous as Mr. Lewis appears to regard them, and the following is the substance of a reply to Mr. Booream, which we have had written for some days. We may be wrong, or perhaps our critic means one thing and we mean another. In any case, we shall be pleased to have him prove his case further. In the answer to Mr. Long, we said that "it is not a fact that the downwardly-moving pistons exactly compensate for the upwardly-moving ones, because the angularity of the connecting rods causes the pistons in the upper half of their stroke to move materially faster than they do in the lower half of their stroke." Mr. Booream says that "in this statement we are wrong." He follows this flat contradiction with a categorical enumeration of six related facts concerning the phenomena involved in the action of a piston, connecting rod, and crank. No exception is to be taken to this enumeration, since he states his facts here with substantial correctness. The point is, they do not apply to the question at issue, except to uphold our side of the argument. To reach briefly the crux of the matter, let Mr. Booream plat the center line, piston, connecting rod, crank circle, and other essential details of a two-cylinder, 5x5-inch vertical engine, with cranks 180° apart, and the connecting rods twice as long as the stroke—ten inches. This done, first regard the situation with the cranks on dead center—one piston clear up and the other clear down. In this position, the volume added beneath the piston that is up, and displaced by the piston that is down, will be ninety-five cubic inches, after making a reasonable allowance for the space occupied by the connecting rod—the area of a five-inch circle being 19.635 square inches, and the ninety-five being secured as 5x19. Now, let the crankshaft be revolved 45°, and the upper piston will drop .75-inch, displacing 14.44 cubic inches, while the lower piston will rise .58 inches, adding 11.02 cubic inches to the crankcase volume. This is a net reduction of 4.42 cubic inches—8.84 cubic inches with a four-cylinder motor—in the volume of the crankcase gases. By continuing the crankshaft rotation another 45° the crankthrows become horizontal, the higher piston having fallen meantime 1.96 inches, displacing 37.24 cubic inches, while the lower piston has risen 1.70 inches, adding a volume of 32.30 cubic inches—a difference here of 4.94 cubic inches. The net result is that each piston has beneath it a volume of 43.32 cubic inches added to the crankcase, a total of 86.64 cubic inches against the 95 cubic inches under one of the pistons before the 90° rotation took place. This means that with a four-cylinder motor 16.62 cubic inches would have to escape from the crankcase during the quarter revolution to maintain the pressure within at what it was. This is not a great deal, but it is enough to prove our point, and a re-reading of our reply to Mr. Long will show that nowhere did we lay any stress upon this particular condition as one of the reasons for breathers. Nevertheless, with very short connecting rods, the closely figured crankcases often used, and the large bores now in vogue, the variations in pressure from the cause referred to might easily become very material. Of course, there is no exception to be taken to Mr. Booream's statement that in a half revolution an equilibrium is reached. A half revolution so obviously reproduces the condition at starting that argument is hardly needed upon a point so obvious.

Concerning Ball Bearings.

Editor THE AUTOMOBILE:

[563.]—Can you tell me why it is that the balls in an annular ball bearing of the Hess-Bright type are not forced against the separating springs by the action of the load during such moments as it is carried practically upon two balls, one on either side of the lowest point of the races? Is it not an objection to ball bearings of this type that some such action may occur under some conditions, with consequent wear, misalignment of shafts, etc.? And is it not a matter of some difficulty to make the springs right to stand the work? An answer on this will oblige me.

Bangor, Me.

CARROLL H. SIMPSON.

The idea that annular ball bearings are subject to some such difficulty as you describe seems to be widely entertained, even by people whose technical knowledge should teach them better. The facts are such as to afford no foundation whatever for the belief, despite its rather astounding prevalence. In the first place, were there such an action, ball bearings of the cup-and-cone type, and of the annular "full type," would be fully as subject to its ill effects as the ball bearings with the separating springs. No ball bearings are made with the races full, there being always a slight space left as insurance against the balls binding against one another. You will realize this when you recall the faint, regular click that accompanies the action of any bicycle ball bearing. This click is due to the balls falling, one after another, over the topmost point of their course, and constitutes in itself all the evidence that could be required to disprove the wedging action suggested as occurring at the bottom of the races. The reason there is no such wedging action is that the load is supported on direct radial lines always extending from the center of rotation. Whether or not the ball positions are such as to make these radii vertical or angular has no bearing upon the case. The point is that, no matter what the ball positions, the stresses upon them are straight crushing stresses, resisted at right angles by whatever portions of the races happen to be behind them. If the two balls, in the case you urge, were on a plane surface, and the load were applied to them through a curved inner race, the balls would be forced apart, but in a bearing the balls are not on a plane surface, being supported by a surface that at all points has the exactly correct curvature to avoid the least tendency to displacement due to the application of the load. Consequently, no resistance is required of the springs in the way of holding against the load. Take all but two balls out of an annular ball bearing some day and you will find that the balls will crush without being separated, no matter how you place them.

The Cost of American and Foreign Steels.

Editor THE AUTOMOBILE:

[564.]—How much more expensive are the imported alloy steels than the domestic carbon steels, and is it a fact that the latter cost as much as the former? I am told, on what I imagine to be pretty good authority, that there is no saving effected by using the poor material, but if this is true why do American automobile manufacturers use anything but the alloy stock? I assume, of course, that there is no doubt of the superiority of the more modern grades.

C. M. CONANT.

Wheeling, W. Va.

It is a fact in many cases that even the difference in cost is not on the side of the carbon steels in this country, and there is probably not much to be said in favor of what any testing machine will conclusively prove the less sturdy material. There are many other factors to be considered, however, besides the mere matter of first cost of stock. The cost of working chrome-nickel and vanadium steels, for instance, may become a decidedly serious matter, and delay in securing deliveries is another—not to be lost sight of by any manufacturer who is in business on a business basis, to make a legitimatæ profit. The highest grade of alloy steel listed by Krupp sells in this country, duty paid, for twenty-

six cents a pound, and the writer knows of a number of cases in which the famous German concern has proved its ability to lay down on the docks in New York City, all charges paid, chrome-nickel steel forgings for less than any American steel-maker would supply them in carbon stock. But the day of this sort of thing is rapidly passing, and America's preeminence in the cheap production of enormous quantities of low-grade structural shapes, rails and the like, seems destined to have added to it a smaller output catering to the growing demand for extraordinarily high qualities. Already several American concerns are specializing on chrome-nickel alloys, and the German boast of two or three years ago that "the whole American steel trust could not duplicate a Mercedes front axle" has ceased to be a fact.

The Practicability of the Original Daimlers.

Editor THE AUTOMOBILE:

[565.]—In answer to the doubts expressed by Robert Miller in the issue of January 10, as to the correctness of my statements about impracticability of certain constructions of two-cycle engines, I would say that I often use the expression "impractical" to signify that an engine equipped in that way will be so much inferior in power efficiency, that in view of the demands for the very best, in this age of thirst for the highest attainments in everything, this dawn of the 19th century, that any construction that cannot be worked out some way, so as to obtain something like ideal action, I call it impractical.

There are often absurd constructions that the best of us may not notice until our attention is called to the reason why it is absurd, but there are few of us whose mechanical instincts are so obtuse that we cannot see it when it is pointed out to us, then we wonder why we did not see it before when it was so very plain, stuck out so conspicuous like. I think that Mr. Miller would be able to see the fallacy of this particular construction, if he was not so influenced by the idea that Daimler had a perfect construction in his engine.

The Daimler engine on its advent into this country, was heralded as the engine that was going to revolutionize the gas engine industry, but the executive of the Daimler people found out that without real merit, no amount of business ability, all of the push, all of the pull that could be brought into use would not build up a reputation; would not make a great and permanent business success of a mechanical mediocrity of achievement.

The trouble with all ordinary two-cycle engines is that they do not get into, or do not retain in their cylinders, a full charge; the fact that they do not develop twice the power that a four-cycle does, when running at the same speed, is positive proof that they do not. With an ordinary crank case compression two-cycle, other than the three-port engine, when the suction stroke that draws the charge into the crank case is completed, ordinarily the vacuum in the crank case will not be filled to completion before the piston begins its return stroke, and compression begins in the crank case, and there will not be as much charge compressed in the crank case as the full piston displacement; when the inlet port opens, and what charge there is compressed in the crank case goes into the cylinder, it will not all go in, the few ounces of pressure left in the crank case when the piston begins its up stroke, represents the amount of charge that should have gone in, but did not. With a mechanically operated inlet to the crank case, with large area and quick action, and with ports of great capacity, these losses at both places are reduced to a minimum, but still you will not get in quite as much charge as you can with the four-cycle construction, with its intake valve made with ample capacity. It is these details of construction that will determine the efficiency or inefficiency of a two-cycle engine, and any obstructions in any of the passages will tend to hinder the free flow of the gases, and will multiply the losses we have just mentioned, and it seems to me to be self-evident that a valve that is held to its seat by its own momentum on its motion being retarded quickly as the piston approaches its center, cannot help but be a very great hindrance to the free passage of the charge into the cylinder, and there will undoubtedly be a great deal more charge left in the crank case than there would have been without this obstruction in the passageway.

There are a number of very difficult problems involved in making a perfect, or somewhere near perfect two-cycle gas engine. The requirements are altogether different from those of a steam engine, a four-cycle, or anything else in modern engineering. All of the functions of a four-cycle are performed by positive means, to get the charge into the cylinder, you use the piston as an air pump to draw it in, when you expel the exhaust, you again use the piston as an air pump to push it out. The two-cycle has no positive way of doing either of these things, but in many respects resembles artillery target practice, it can get there with reasonable accuracy, but will go very wide from the mark unless everything is exactly right, and I believe that it would be easier for one man

to work out all of the things required to be known in order to send a projectile within a foot or so of a target two or three miles away, than to work out all of the problems involved in making a reasonably perfect two-cycle gas engine, but when they are all worked out, the two-cycle will perform all of the functions of a gas engine with a great deal more accuracy than a four-cycle does, and develops the power with much better economy.

Quite a number of years ago I began an exhaustive series of experiments, to determine, if possible, the way to get the charge into a two-cycle engine, and keep it distinct from the exhaust gases, and many other things that I desired to know.

After a few preliminary experiments to determine the exact pressures that an explosive charge would give when it was ignited under different degrees of compression, how long the pressure would stand before it would diminish, etc. I had a 6x8 two-cycle engine made, and planned so that I could easily replace the cylinder with another, whenever I wished to try some different form, as my knowledge developed.

Among my first experiments with this engine, was placing the inlet to the power cylinder as a valve in the piston head. I rather expected that the inertia of the valve would hinder the free passage of the air, and as this was only one of several things that I wished to find out with this series of experiments, I made the valve stem as long as the space would permit, so that I could put a cross bar on it that would strike against adjustable stops in the bottom of the cylinder, when the piston on its down stroke brought the cross bar on the valve stem in contact with the stops, the valve could go no farther, and the piston would go on down to the end of its stroke, leaving the valve open because of its inability to follow. In this way I could find out exactly the length of time that it took to relieve the pressure in the cylinder, so as to avoid igniting the charge in the crank case; I could set the inlet valve so that it would open at such a point that back firing would occur promptly at a speed of 500 r.p.m., or at 1,000 r.p.m., so that it would not occur at the biggest speeds that the engine would ever attain.

With this construction, I found that the engine would run nicely without the stops for lifting the valve, up to a speed of 400 r.p.m. With the stops lifting the valves at the right time, the engine would run 1,500 r.p.m. With the stops, the engine showed 30 per cent. more power under the brake, at all speeds above 200 r.p.m., than it developed when the compression in the crank case had to lift the valve itself.

It is only by making accurate measurements of the power, and everything that conduces to the efficiency or inefficiency of an engine, that we can form anything like an accurate idea of the real merits or demerits of any particular form of construction; if we depend altogether on what it seems to do, we often make blunders and come to conclusions that the facts do not warrant.

Detroit, Mich.

C. P. MALCOLM.

Having collaborated with Mr. Miller in the criticism of Mr. Malcolm's statements, I am, with Mr. Miller's approval, taking it upon myself to refute Mr. Malcolm's reply. To proceed categorically, I am particularly interested in Mr. Malcolm's assumption that the early V-shaped Daimler engines, with valves in the pistons, are "impractical," since it is a most absolute fact that many of these engines are still in use, after periods of service that would do credit to many of the modern designs evolved from them, besides which they are very much more efficient than any modern two-cycle motor. Right now, to-day, one of these engines is in use in the New York Park Department, doing work that it has done consistently and successfully for ten years. And—to dispose of the assertion that this engine "was heralded as the engine to revolutionize the gas engine industry"—is it not definite fact that it was the first practical liquid-fuel engine ever made, and that its direct successors, the Mercedes motors, are at least fairly in line with most modern progress? Surely any contrary view would be a "mechanical instinct as obtuse" as the chronological instinct that characterizes the present time as "this dawn of the nineteenth century." The "trouble with all ordinary two-cycle engines" is, of course, perfectly well understood to be—among other things—the failure to receive full charges. Mr. Malcolm will get no argument on this, nor will any exception be taken to his generalizations concerning the other well-known features of correct two-cycle practice. The points he misses, however, seem rather to be those entering into the problem only when the more serious defects of current practice are eliminated, instead of merely modified. His theories concerning the momentum valve in the pistons, for instance, fall in this category, and are not in any sense proved correct by enumeration of platitudes concerning

the difference between steam engines and gas engines, and between four-cycle engines and two-cycle engines. Nor do I find myself very patient with the idea of "getting the charge in and keeping it distinct from the exhaust gases." Why isn't the solution to be found in getting the exhaust out, really out, first? And certainly it must be admitted that the exhaust cannot be scavenged out by the incoming charge without either wasting charge or scavenging incompletely. So why work seriously along so hopeless a line at all? I can readily understand Mr. Malcolm's success in building a two-cycle engine with a momentum valve that did not work, but before being too sure that the defect was inherent in the use of such a valve, I should want to know how low the terminal pressure above it was dropped before it was expected to open, how much it weighed in proportion to the area it presented to the crank-case charge, and what the result would have been had the possibility of back firing been done away with positively, regardless of speeds or time of valve opening. These considerations Mr. Malcolm has not troubled to touch upon, so until we secure more definite contradiction, I think that Mr. Miller and myself will persevere in our benighted notion that all of the possibilities of liquid-fuel engine improvement are not bound up in mere adaptations of present constructions, and in ill-advised applications of unusual constructions without such more radical alterations as might properly accompany them. VICTOR LOUGHEED.

Information Requisite for 30-day European Tour.

Editor THE AUTOMOBILE:

[566.]—I am contemplating a thirty days' tour abroad in an American-made automobile of 35 horsepower. Can you give me the following information or suggest where I can obtain same?

1. The approximate ocean freight on car weighing approximately 3,000 pounds crated. Would want to ship car on one of best German liners.
2. How much duty on American automobiles going into France and what are necessary steps to get same refunded on returning?
3. Would I have to take out an operator's license in France and Germany, length of time required and expense of obtaining such licenses?
4. Would I experience any difficulty in provincial towns without a mechanician? Can I obtain gasoline that will work O. K. in a Schebler carbureter? JOHN H. PORTER.
Denver, Col.

The cost of shipment of an automobile from New York to a French port (Havre or Cherbourg) varies from \$90 to \$150 according to the steamer and weight and size of car. Crating in New York varies from \$60 to \$100. Inquiries as to transport should be made some time in advance, as automobiles are sometimes refused on the crack liners, being sent on the slower cargo boats. The customs duty on automobiles entering France is \$12 per 220 pounds (100 kilos). When imported for touring or other temporary purposes, the duty so paid will be refunded at the frontier when the vehicle leaves France on presentation of the receipt given at the port of entry. On becoming a member of the Touring Club de France you can, by depositing the amount of customs duty with that body, obtain a license for free international circulation known as a "Tryptique." This can be obtained by correspondence in advance, and on landing the automobilist passes the customs without any formality or the payment of money. The "Tryptique" gives free entry into nearly every European country. Membership in the Touring Club de France is \$1 per year. Members of the A. A. A. are admitted on request; other persons must be proposed by two members of the Club.

An operating license must be taken out in France. The necessary documents are three small unmounted photographs of the applicant, a certificate of domicile, this will be given by your landlord, and a 12 cent sheet of stamped paper, on which must be written a formal demand for a driving examination. These must be sent to the Prefect of the Department in which you are residing. If in Paris, take the papers to the Association Générale Automobile, Place de la Concorde. The driving license issued by this body will cost you \$2, but you will not have to

wait, and you will have no annoying formalities. A French driving license would be accepted for a tour through Germany. Capable repair men are to be found in every town in France; and you would never experience any difficulty by traveling without a mechanician. The gasoline commonly supplied in every store and garage in France and Germany will be quite satisfactory on a Schebler carbureter. You will find useful information on touring in Europe in our issues of March 8, March 29, and May 24, 1906, as well as in the series of articles now running in THE AUTOMOBILE, by Francis Miltoun.

Steam-Engine Cylinders vs. Gasoline-Engine Cylinders.

Editor THE AUTOMOBILE:

[567.]—To settle a dispute, will you please tell me which is better to propel an automobile—one double-acting steam engine cylinder, or four four-cycle gasoline engine cylinders? W. H. TURNER, JR.
Canton, Ohio.

So much depends upon the standpoint from which the comparison of merits is to be made that it is difficult to render a satisfactory decision. Better in what way? If the successful usage of the industry be taken as a criterion, surely the evidence is overwhelmingly in favor of the four gasoline-engine cylinders. Even the very few makes of very successful steam cars are without exception propelled by at least two-cylinder engines, and the writer is not able to recall a single instance of steam-car construction in which the single cylinder has found anything more than experimental application. If you wish a judgment premised upon abstract engineering facts, rather than upon practical results secured, there is much in favor of the steam side of the argument. The four-cylinder gasoline engine has practically a one-throw crank, all of the duplication involved, in the way of a plurality of cylinders, pistons, connecting rods, crankshaft elaboration, etc., being mere details necessitated by the limitations of present types of gasoline engines, to make every up-and-down stroke of the complete engine a power stroke. The single double-acting steam cylinder likewise operates on a single-throw crankshaft, in this case of the simplest possible description, however, and also affords an impulse for every up-and-down stroke. And, more than this, its impulses are better sustained, more flexible, and in other respects materially superior to those secured with the gasoline engine.

CHECK VALVE INLET IN TWO-CYCLE ENGINES.

Editor THE AUTOMOBILE:

[568.]—Referring to the letter of L. R. Wottring in the issue of "The Automobile" of January 17, if it were worth while to start a discussion on the matter, I would like to remind him that almost the only advantage there is to be gained from admitting the charge by check valve through the piston head, is that of locating it at a point of small cubic capacity, so that when only a very small amount of mixture enters the cylinder, as when the engine is throttled down and running very light, the spark plug can be placed where the charge is certain to come in contact with it, so that no matter how small a quantity enters, that quantity will be sure to become ignited. This is an important consideration and his construction will not permit us to avail ourselves even of that, which is the only reasonable excuse for a check valve that could otherwise be dispensed with. C. P. MALCOLM.
Detroit, Mich.

ONE CORRESPONDENT HELPS OUT ANOTHER.

Editor THE AUTOMOBILE:

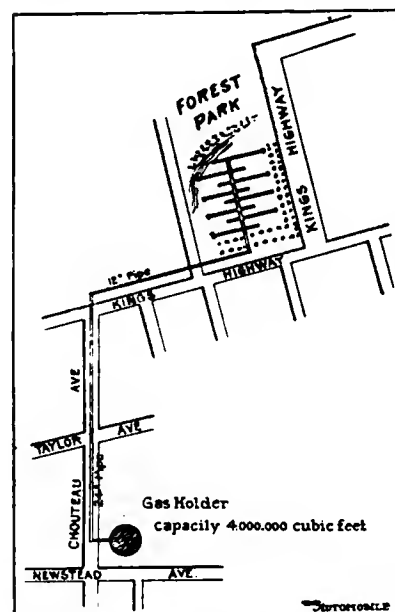
[569.]—In a recent issue of "The Automobile," that of December 20, 1906, one of your readers asked, in question 508, what could be done to restore the surface and transparency of a celluloid window that had become scratched and dimmed by use. You admitted your inability to solve the problem, and said you would be pleased to have any reader help the inquirer out. I think I can do this. If a worn sheet of transparent celluloid is varnished on the worn side (on both sides if both sides are worn) with a very thin, even coat of any transparent varnish, it will recover practically its original condition and appearance. Probably the best varnish for the purpose is made by dissolving a quantity of transparent celluloid in acetone, making the solution exceedingly thin, and applying more than one coat if necessary. HARRY CHILTON.
Asbury Park, N. J.

FIVE NATIONS TO CONTEST BALLOON RACE.

Fifteen engagements have been regularized for the Gordon Bennett balloon race at St. Louis, next October. The countries represented are France, England, Germany, Spain and the United States, each with three balloons. Italian and Belgian participation is not yet decided upon. The teams will probably be made

up as follows: France, Comte Henry de la Vaulx, Comte George de Castillon and Jacques Balsam; England, Hon. C. S. Rolls, F. H. Butler, A. K. Huntington; Germany, Captain Hildebrandt, Baron Hewald and Captain von Abercorn; Spain, Captain A. Duani, Lieut. Herrera and Senor Salamanca; United States, Lieut. Lahm, J. C. McCoy and one other yet to be decided upon.

Balloons will be inflated in Forest Park, St. Louis, from the Leclède Gas Light Company's plant. Arrangements for the laying of the pipes from the company's tank—the largest in the United States—have already been made,



HOW THE GAS WILL BE CONDUCTED.
Arrangement of pipes from gas works to Forest Park, St. Louis, for the International Aerial Race, October 19.

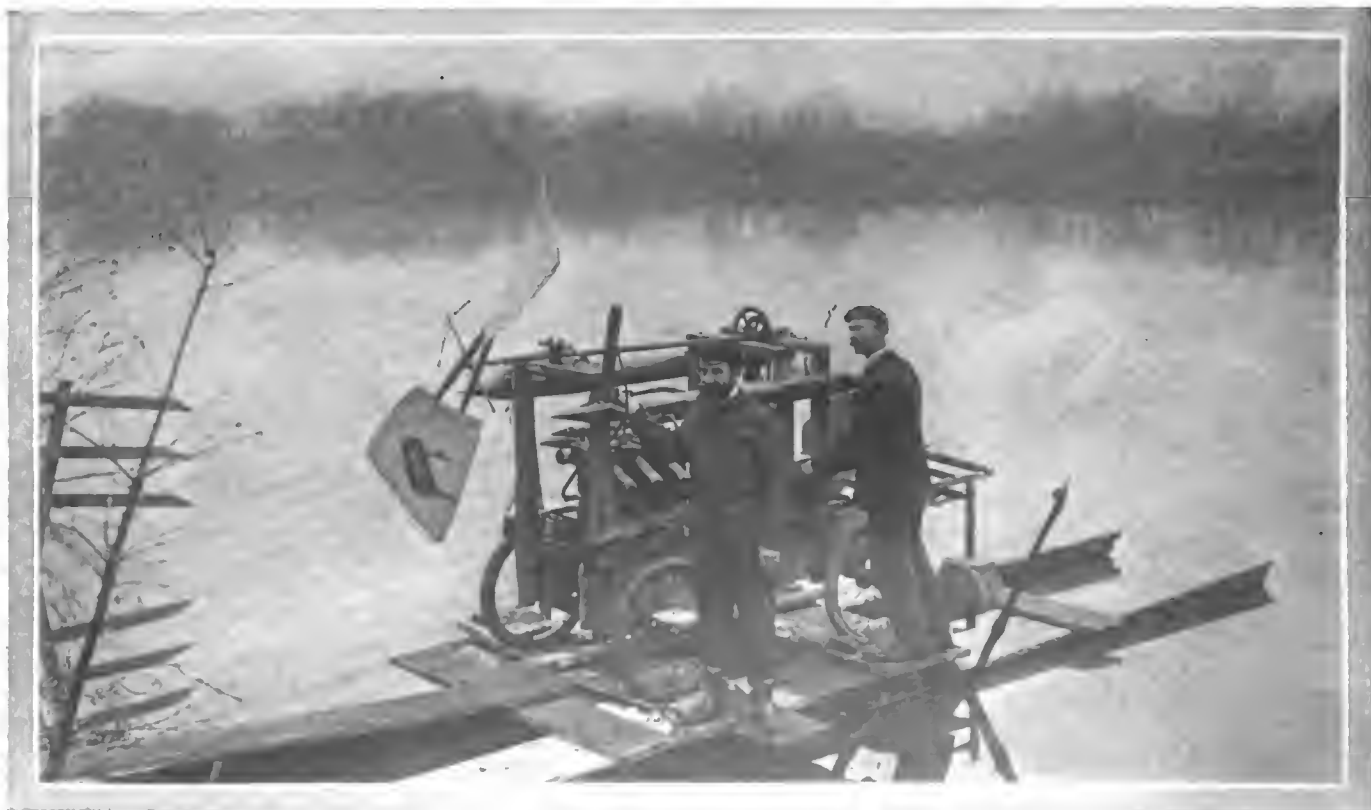
the plans being as shown in the accompanying sketch. Twenty-four-inch main pipes lead from the tank, with twelve-inch branch pipes running left and right for each balloon, allowing simultaneous inflation. For the first Gordon Bennett balloon race, starting from Paris last year, there were sixteen competitors; thus the American contest is only one short of the number of starters in that immensely popular race.

NOVEL AERONAUTICAL EXPERIMENTS.

LONDON, Jan. 26.—The attention of inventors and mechanical experts of every degree of efficiency having been drawn to aeronautics by the numerous prizes recently offered, experiments are being carried on in every part of Europe with a view to the evolution of that perfect machine which will make the aerial regions as natural to us as terra firma. In the neighborhood of Paris Santos-Dumont varies his attempted flights with experiments of wings and rudders attached to a racing automobile. Captain Ferber, the French expert, rushes along deserted roads with a propeller-driven automobile in his search for the best type of blades and the most perfect equilibrium. M. Bellamy, also of Gallic origin, has taken up his headquarters at Weybridge, England, and is experimenting there with hopes of finally winning the *Daily Mail* \$50,000 prize for successful flight. The apparatus shown in the accompanying illustration has not at first sight any close connection with a flying machine. It is an aero-catamaran, and is used to test the power of various types of screw propellers, and also to find out the positions in which they work to the best advantage. It consists of two attenuated punts, on which are fixed the wheels and frame of an automobile. Above this is a 50-horsepower motor, driving a propeller shaft on which experimental blades are fitted. It is a crude, amateurish-looking structure, but it answers its purpose, driving the slender punts up and down the secluded sheet of water to the satisfaction of its owner.

ANOTHER SUCCESSFUL FRENCH FLIGHT.

PARIS, Feb. 3.—Comte de la Vaulx made another successful trip in his new steerable balloon this afternoon at Sartrouville. Within three minutes of ascending the motor was cranked and the machine described a huge circle at a height of about two hundred meters, traveling at the rate of twenty-two miles an hour. A straight run was next made towards Houilles against the wind, the return run to leeward being performed at a very high rate of speed. After remaining in the air twenty-five minutes, answering its helm perfectly, a successful descent was made. Eighty-eight pounds of ballast were carried. The balloon has now been inflated forty-six days and is still in excellent condition. Much greater speed is expected when the new propellers are fitted.

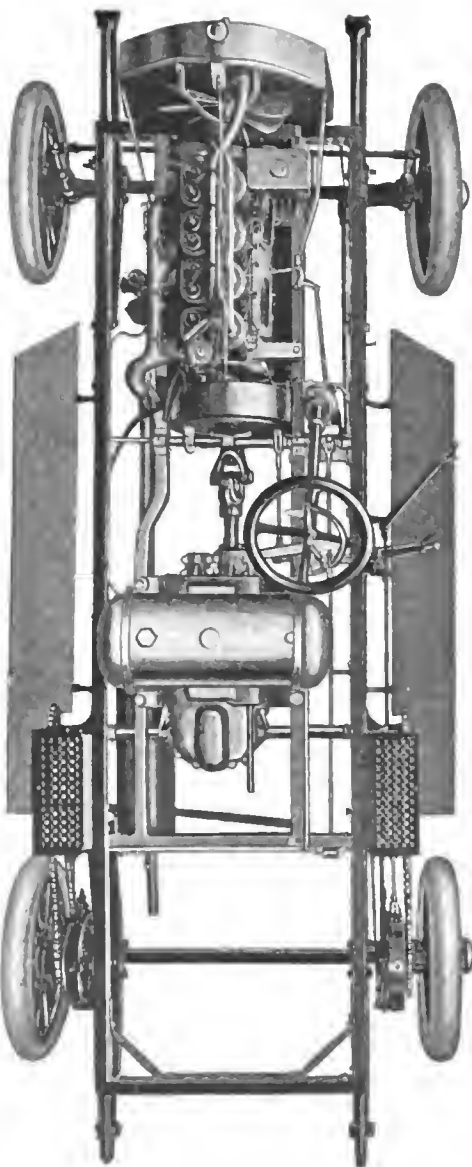


TRYING TO SOLVE THE AERIAL NAVIGATION PROBLEM BY EXPERIMENTS AT WEYBRIDGE, ENGLAND.



THE Grout Brothers Automobile Company of Orange, Mass., will produce only one model for 1907, with practically no changes on last year's type except in the way of conveniences and appointments. The equipment is specially liberal this year; in addition to the waterproof top a pair of headlights and generator is included. There is an adjustable foot-rest in the tonneau, which will be found a great relief when touring, and a robe rail on the back of the front seat. A roomy box is attached under and at the extreme rear of the car, and with the tool box on the running board, provides ample storage for tools and spare parts. Adjustable stuffing boxes on the counter shaft and main driving shaft and a metal pan under the fly wheel and engine prevent the dropping of oil or grease on the garage floor or street. The body is made of laminated wood with individual front seats and ample room on the rear for three passengers. Standard colors are Merrimac green or royal blue, but other colors are used when requested.

Mechanical Features.—The Grout cars are equipped with a 35-horsepower four-cylinder engine with cylinders cast singly, 4 1-2 by 5 inches bore and stroke. The crankshaft is supplied with 2 1-4-inch bearings between each crank, and are of hammered babbitt. The pistons have four rings and give from 68 to 75 pounds pressure. The valves, which are interchangeable, have a 2-inch bearing and 3-8-inch lift. The engine is carried forward under a metal hood, with a cellular radiator in front of it and a belt-driven fan running on ball bearings. A positive feed lubricator gives the engine the necessary amount of oil, through seven feeds and without check valves. Besides the splash, oil



TOP VIEW OF THE GROUT CHASSIS.

may be supplied to the crankcase through neatly shaped funnels which are fastened to the breathing pipes leading into the hand plate on the side of the crankcase. These funnels are supplied with fine mesh strainers, thus preventing sediment or dirt getting into the crankshaft case.

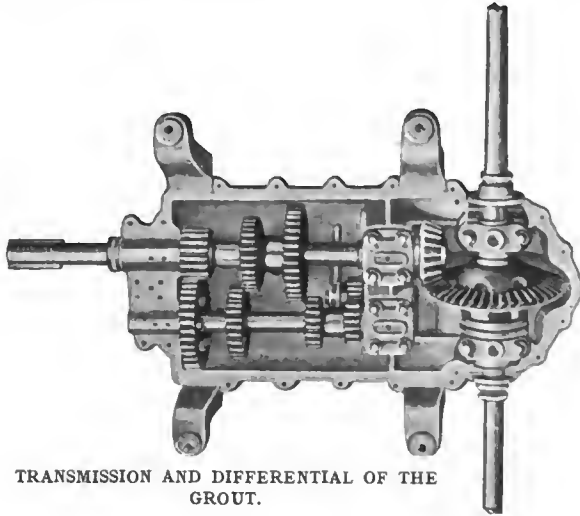
Ignition is by high-tension jump spark, using single coil for the four cylinders, with a new distributing commutator. All wiring is held in place by supports, preventing all possibility of short-circuiting.

Transmission and Clutch.—A cone-shaped leather-faced clutch is employed. Its dimensions are 2 1-4 face by 16 1-2 inches diameter. Between the clutch and transmission is a universal joint made of heavy cast phosphor bronze. The transmission is of the progressive type, giving three speeds ahead and reverse. Gears have full inch face with teeth beveled on both ends to assure free sliding. Hardened nickel steel stock is employed exclusively for gears. All transmission bearings are of bronze and are supplied with oil holes and wells. The differential is housed in the transmission gearcase.

Drive.—The final drive is through countershaft and side chains. The countershaft is a 1 1-2-inch shaft made of machinery steel running through bronze boxes attached to each side member, these being equipped with extra large grease cups. To each end of the counter shaft is attached a 22-tooth sprocket; each rear wheel carries a 34-tooth sprocket, and Whitney roller chains are employed. Wheels are made of seasoned hickory with steel castings for the hubs. They are 32 by 4 inches in size and mounted on ball bearings.

Steering.—The steering rods and connections are exceptionally large and are adjustable throughout. The distance rod is supplied at each end with the Grout cone bolt, while

to the chassis, and the arrangement is such that the body can be removed without disturbing the mechanism in any way. Waterproof leather is used for the upholstering of the wood body.



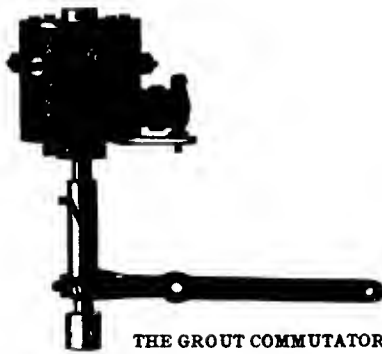
TRANSMISSION AND DIFFERENTIAL OF THE GROUT.

the ball and socket joints have spring buffers which take up all road shocks. Steering gear is of worm and sector type. Gas and ignition control is by levers on the top of the steering wheel, the quadrant being stationary.

Brakes.—To each rear wheel is attached two powerful brakes operated by a foot pedal; the emergency brake is of the external contracting type, operated by an outside lever.

Before the emergency brake is applied the clutch is automatically released. The external brake is lined with camel's hair belting.

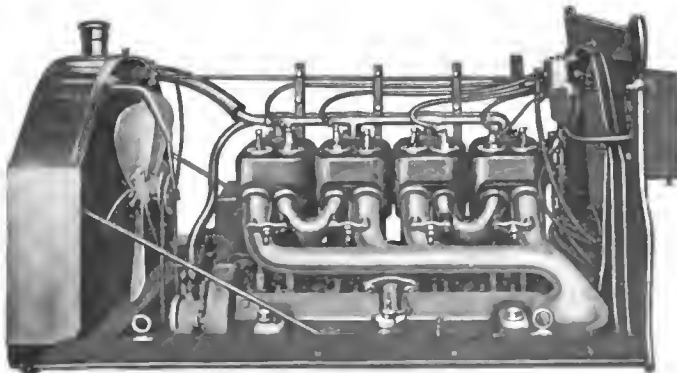
The Muffler consists of four concentric cylinders with small holes leading from one to the other. The muffler cut-out consists of a plate in the shape of a Maltese cross, which can be rotated to cover or uncover a similarly shaped opening in the end of the muffler.



THE GROUT COMMUTATOR.

Axles.—Both front and back axles are solid, one and one-half inches square, made of three per cent. nickel steel.

Frame.—Armored wood is employed for the frame, the one-fourth-inch steel armor plates forming heavy braces at the corners. The engine frame is channel-steel, well braced, extending backward far enough to support the transmission as well. A fifteen-gallon oil tank of seamless pressed steel



INLET AND EXHAUST SIDE 35-H.P. GROUT MOTOR.

(sufficient capacity to run 175 miles) is supported upon the chassis under the front seats, but not connected with the body.

Body.—Four bolts only are employed to connect the body

AN AMERICAN ON THE AMERICAN INVASION.

PARIS, Jan. 25.—Arthur E. Schwartz, of New York, believes that an American invasion of the European automobile market is feasible and inevitable. Mr. Schwartz is now in Paris, and is supporting his confidence to the extent of looking for a vacant storeroom either in the Avenue de la Grande Armée or the Avenue des Champs Elysées (where they are scarce and high priced), with the idea of installing an agency for American automobiles. The faithful remark regarding "coals to Newcastle" is applicable, but listen to Mr. Schwartz, whose argument sounds like sense:

"I can sell in Paris, at a profit, for about 22,000 francs (\$4,400), an American, four-cylinder 50-horsepower automobile, with open touring body, top and headlights, fully equipped in all details. This would be a first-class machine, the material and workmanship comparing with those of a similar car made on the Continent.

"American automobiles are built strong, having in view America's rough and bad roads, and surely, this quality of strength will never prove to be a disadvantage on Europe's smooth roads. Moreover there are a few bad roads in Europe.

"Now consider the question of speed, as that is always important, and particularly important when we discuss it in relation to France. I am personally interested in a certain make of American automobiles, the Wayne, for instance, which I consider to be among the best, but we will talk about a rival, for which I have plenty of admiration. I refer to the Packard, merely as an example. I have seen a Packard on French roads developing and maintaining greater speed than certain French, German, and other famous flyers—and, mark you, with less noise. I can say as much for the Pierce, which is also becoming well and favorably known in Europe. As for noise, Packards and Pierces make less noise than Panhards, Mercedes, Dietrichs, or even Renaults, which have a special reputation for that much desired quality.

"American motors are less complicated than French motors, and all automobilists must appreciate this feature. An American firm establishing an office in Paris should do things on a liberal scale, and not bury its agency in somebody's garage, where it will be systematically and patriotically interred."

Mr. Schwartz intimates that he is collecting all available information and "pointers" on the subject, to be forwarded to the American Motor Car Manufacturers' Association, which he is representing in a sort of "commercial-scout" capacity.

He maintains that American automobiles, such as Packard, Pierce, Locomobile, Royal Tourist, Peerless, and Wayne, to mention only a few, are rightfully in the same class as Panhard, Mors, Mercedes, Rochet-Schneider, de Dion-Bouton, de Dietrich and Renault.

ANTICIPATING THE AMERICAN INVASION.

PARIS, Jan. 30.—From rumors current, some of the shrewdest selling factors in France are making preparations for the advent of the American-made automobile, and names no less prominent in the trade than those of C. L. Charley and Emile Stern are connected with the rumors. These leading Paris dealers are said to be contemplating the establishment of an agency in Paris to handle American cars. This agency will probably enter into the business already established in the Champs Elysees, under the management of M. Stern, who was formerly the Leon Bollee agent, but who no longer handles that line. His establishment now carries a general line of makes that are well known. M. Charley is the well-known Mercedes representative, but that, it is understood, would not prevent him from becoming interested in the enterprise.



A Car from the Northwest The WOLFE

BUILT by Westerners for the West, is the slogan of the makers of the Wolfe, the H. E. Wilcox Motor Car Company, who have recently opened a factory in Minneapolis, Minn., to turn out cars of the type depicted by the foregoing photograph. A maximum amount of power with a minimum gross weight has been the object of its designer throughout, bearing in mind the fact that it is intended to be used where, to a very great extent, roads are such in name only. For the same reason special attention has been paid to the matter of providing ample road clearance. The car is the result of several years' experience in using and repairing cars on the part of its designer, who has accordingly not attempted to incorporate in it any mechanical novelties or untried inventions, but has taken advantage of his experience and observation during that time to adopt only such features of design as have stood the test of time successfully.

The power plant of the car consists of a four-cylinder, 24-horsepower. Carrico air-cooled engine, the efficiency and staying powers of which have been amply tested in trials carried out under the hardest of service conditions. The cylinder dimensions are 4 by 4 inches, and the motor has a wide speed range. Ignition is by the high tension system, while a Universal carbureter is provided to take care of this essential. A multiple force feed oiler of the mechanical type with independent feeds leading to all the important bearings of the engine is provided for lubrication, the oiler being attached to the engine in such a manner that no amount of shaking or vibration can break off the leads. Lubrication is generally conceded to be by far the most important essential on every automobile engine, and this is particularly the case with the air-cooled engine. The oiler tank itself has a capacity of two quarts, and in order to simplify the matter of oiling and the amount of attention required, advantage has been taken of the false front usually employed on air-cooled cars to provide extra oil-carrying capacity. It has been built out somewhat like the radiator of a water-cooled car, and the surrounding wall utilized to carry a reserve supply of oil. This is supplied through what appears to be a water supply cap for the radiator, and this compartment is connected to the force feed oiler, so that it is only necessary to open a small valve to fill the latter from the reserve supply in this

novel and ingenious tank. It permits of carrying two and a half gallons of oil, which, it is said, are sufficient to last the average autoist for about a month.

A leather-faced cone clutch of the standard type forms the first step in the transmission of the power to the rear wheels, the next taking the form of a three speed and reverse gear-box contained in an aluminum casing, which also houses the differential and countershaft, the final drive being by means of double side chains. In order to prevent damaging the gears an interlocking device is provided, which is so arranged that it is impossible to disengage the pinions before the clutch is entirely out. This is in the form of a pin attached to the pedal; when the clutch is engaged this pin drops into the shifting rod, so that the latter cannot be moved until the clutch is entirely out of engagement. Combining the change speed-gear box and the differential in this manner makes a very compact transmission unit. The double-chain type of drive has been adopted in order to free the rear axle from any encumbrances in the shape of a differential, so that ample road clearance may be provided. Both front and rear axles are perfectly plain, solid bars of square section, 1 1/2 inches in diameter, giving a full 16-inch clearance at all points. The front axle is placed well forward, as is customary with Continental designers, and avoids the necessity of giving it a bend in order to clear the motor. The steering arm is placed forward of the axle; the steering yokes and knuckles are drop forgings of high-grade steel. Both axles have been made of a size largely in excess of that necessary for the car's weight of 1,900 pounds, and, in fact, have a factor of safety of many times that weight. All the wheels run on Timkin roller bearings of generous dimensions.

Suspension is by means of full elliptic springs, both front and rear, experience having demonstrated that this is a type that is particularly suited to the needs of cars designed for use in the western portions of this country. All the springs have been 36 inches in length with an eight inch opening. The wheelbase is 108 inches, and the tread standard, 34 by 3 1/2-inch wheels being employed, the make of tires being left to the option of the buyer. With a standard type side-entrance touring body, and the usual equipment, the car lists at \$1,800.



DEMONSTRATING A. B. L. M. PIRATE UNDER DIFFICULTIES.



PLOWING A STODDARD-DAYTON THROUGH THE SNOW.



THE WAY A COLUMBIA CONQUERED A BADLY DRIFTED ROAD AT AVON, CONN.



A LOGAN TRUCK HUB DEEP IN THE "BEAUTIFUL."



ASSISTING A HEAVILY LADEN TEAM UPGRADE AT SEATTLE, WASH.

HOW THE ALL-CONQUERING AUTOMOBILE DEFIES BOREAS' CHILLING BLASTS.

THE AUTOMOBILE CLUBS OF CHICAGO

LIKE many other organizations which to-day are in a strong and healthy condition, the Chicago Automobile Club, which now numbers its membership up in the hundreds, and which is probably the second in prominence in the country, had a small beginning. Back in 1902, when automobiling was beginning to push itself forward and claim recognition from an incredulous public, the Chicago Automobile Club was formed, at the time, as a voluntary organization. Several enthusiastic devotees met together and formed the organization, formulated a constitution and elected officers as follows: President, Arthur J. Eddy; vice-president, F. C. Donald; secretary, Charles T. Jeffrey; treasurer, Dr. David Cottrell.

The club met at an office in one of the downtown buildings, the Monadnock, and the members worked, heart and soul, to push the movement forward. During this period Mr. Eddy resigned the executive office, and F. C. Donald, whose name is identified with the club from its inception, was elevated to the chair. Stronger and more powerful grew the club in an exceedingly short space of time, and the year after its organization moved into the clubhouse at 243 Michigan avenue, where it remained until May 1, 1906, when the offices were moved into the Fisher building and the new clubhouse was started later in the year at Plymouth court, where the work is now in progress.

July 2, 1903, the organization was incorporated under the laws of the State of Illinois, and the signatures on the articles were: Jerry A. Ellis, Charles E. Bartley, Robert Tarrant, Jr., and Charles W. Gray. The first directors under the incorporation were F. C. Donald, Charles E. Bartley, W. H. Hoops, Dr. F. C. Greene, J. A. Ellis, F. X. Mudd, Robert Tarrant, Jr., S. A. Miles, Charles W. Gray, John Farson, and Dr. F. H. Davis. The objects of the club were: "The promotion and maintenance of a social organization composed of persons owning and interested in the use of self-propelled vehicles for private use; to afford a means of recording the experience of members and other users of automobiles; to promote original investigation in the development of motor carriages; to co-operate with others interested in securing rational legislation, rules and regulations governing the use of automobiles; to promote the interests of owners and users of automobiles against unjust or unreasonable legislation; to maintain the lawful rights of owners or users of automobiles; to promote and encourage the improvement of the highways and generally to maintain a social club devoted to automobilism."

From the time of its incorporation the club has lived up to these objects, and has greatly advanced automobiling interests in Chicago and the State of Illinois. The names of Sidney S. Gorham, John Farson and Ira M. Cobe, especially, are closely connected with the grand growth of the club, and their efforts have always been directed towards the good of the body. Mr. Gorham was appointed to fill the vacant position of secretary in 1904, early in the year, J. W. Dutly having resigned. Since that time he has remained in office continuously, and his efforts, especially on the legal side of automobilism, have been far reaching. John Farson and Ira M. Cobe have held the office of president between them since 1903, Mr. Farson being at the head 1903-4 and 1905-6, and Mr. Cobe 1904-5 and 1906-7. Their rule has been excellent and the organization has greatly prospered under them.

The new clubhouse, into which the members will move this coming spring, will be one of the most complete and handsome of its kind in the world. It is well advanced in construction now, and work is pressing rapidly forward. At the laying of the cornerstone some weeks ago Mayor Dunne assisted, thus attesting the position which the organization maintains in civic affairs. The membership of the club is now limited to 600, which may be increased to a number not exceeding 1,000. Dues and initiation fees have been raised, and the treasury is in a healthy con-

dition. The officers at the present time are: President, Ira M. Cobe; first vice-president, Frank H. Pietsch; second vice-president, Harry J. Powers; secretary, Sidney S. Gorham; treasurer, T. J. Hyman; directors, John Farson, S. K. Martin, Jr., Joseph Gunther, B. H. Marshall, L. E. Myers and Charles E. Gregory.

An Energetic Youngster, the Chicago Motor Club.

The Chicago Motor Club, a new organization devoted to automobiling, was formed early in August, 1906, the incorporators being Charles Root, George G. Greenburg, and William H. Arthur. The club was organized to have proper legislation enacted for automobilists and for inaugurating and conducting competitive events. Under its auspices, in connection with the Chicago Automobile Trade Association, the recent successful economy tour to Cedar Lake, Ind., was conducted, and there has already been outlined a plan for a busy season of interesting events, which will be inaugurated with the advent of spring.

The club has no clubhouse and no social features. Its meetings are held at the New Southern Hotel, on Michigan avenue. It encourages motoring competition, and at present is carrying on a vigorous campaign for the placing of sign boards throughout the State of Illinois and southeast Wisconsin on all main roads leading to popular places; it is endeavoring to have all vehicles carry lights; it is warring on autoists who run away in their cars after causing an accident, or have been the indirect means of causing one, and offers \$50 for the arrest and conviction of anybody so doing; it is taking up the problem of gas search lights for automobiles and other problems which vitally affect the sport.

The organization works hand in hand with the Chicago Automobile Club and Chicago Automobile Trade Association in the reform movements. It is a member of the A. A. A. and the I. S. A. A. There are at present exactly one hundred members in the organization. The membership is not limited. The officers follow: President, William H. Arthur; first vice-president, Joseph F. Gunther; second vice-president, John W. Hayden; secretary and treasurer, George G. Greenburg; directors, Charles P. Root, F. C. Donald, Thomas Hay, Frank C. Riggs and W. L. Githens.

Austin Automobile Club Plans a Great Future.

CHICAGO, Feb. 4.—At the annual meeting of the Austin Automobile Club held last week, Joseph H. Francis, a former alderman, was elected president. The club is in favor of extending and covering all the district in west Chicago from the river to Desplaines. In this way its membership would probably be increased four or five times over what it is now. It was also proposed to change the name of the organization to West Chicago Automobile Club. The following officers were elected: President, J. H. Francis; first vice-president, C. E. Ingalls; second vice-president, J. E. Plew; secretary, E. G. Westwood; treasurer, John Wayman; counsel, A. J. Redmond; surgeon, Dr. B. A. McBurney; directors, the above-named officers, and Charles Burras, A. L. Osterloh and Dr. R. C. Newell.

A committee consisting of President Francis, Secretary Westwood and C. H. Burras was appointed to confer with the West Park Commissioners regarding the erection of a public garage in Garfield Park. President Francis, J. E. Plew, H. M. Lay and John Hemwall were appointed to confer with auto owners in West Chicago in regard to the feasibility of forming the above proposed organization, and were given authority to arrange for a mass meeting of the automobile owners of the district, some 1,200 in number, to be held within two weeks. Preliminary architects' estimates provide for a clubhouse to be located near Garfield Park, costing about \$20,000.

AMONG THE CLUBS IN GENERAL.

Jersey Autoists Will Watch Legislation.

NEWARK, N. J., Feb. 4.—The first gun in the battle of Jersey motorists for a more satisfactory motor vehicle law is to be fired at a meeting of the New Jersey Automobile and Motor Club, which is to be held at the clubhouse of the Newark organization within the next two weeks. At this meeting important questions are to be settled by a vote of all the members of the club, and the decision is to be made as to how the fight in the legislature, if there is to be concerted action by the New Jersey organization, can best be carried on. Last winter, it will be remembered, several hundred of the most influential members of the New Jersey Club went down to Trenton in a body, and had great success in making more equitable some of the provisions of the Frelinghuysen automobile bill as at first proposed by the legislature.

There are two plans of action which will be considered at this meeting. The first is for as many members of all the Jersey clubs as possible to go to Trenton in a body and appear before the legislature committee which will be in charge of any automobile bill which may be introduced. The second provides that a committee of influential members be sent to Trenton with authority to act in the interests of the Jersey automobilists. Whichever of these two plans is adopted, it is certain that all automobile legislation will be closely watched, and any prejudicial to the interests of the automobilist will be vigorously attacked.

Pennsylvania Motor Federation Growing Apace.

PITTSBURG, PA., Feb. 4.—Officers of the Pennsylvania Motor Federation have been doing some solid work during the past few months, and hope soon to have something to show for their efforts. A new motor vehicle law will be introduced which is believed to be a decided improvement on the present law, and encouraging progress has been made in the effort to have introduced a bill providing for a system of State roads and looking to the improvement of the old road connecting Philadelphia and Pittsburg, opening to the tourist its wealth of scenic beauty and historic interest.

Membership is increasing in the Federation, the Wilkesburg Automobile Club and the Automobile Club of Delaware county being the latest acquisitions. Both these clubs organized with a membership of forty. Fifteen clubs are now affiliated with the Federation.

Minneapolitans Will Issue a Club Directory.

MINNEAPOLIS, MINN., Feb. 2.—A booklet containing the names, addresses, license numbers, etc., of the Minneapolis Automobile Club, will be issued shortly. To gather the necessary data for this book, Secretary R. J. Smith has sent out circular letters to all members with an enclosed reply card. Membership cards for the season of 1907 will not be issued until April 1. The new cards will be depositable as bail in case of arrest, as are the present ones.

A bill, which has been drafted by a committee of the club, urging a more careful licensing of autos, consolidating the present State and city speed regulations, and clearly defining the rules of the road, will be introduced in the Minnesota legislature in the near future.

Quaker City Motor Club Election to be Exciting.

PHILADELPHIA, Feb. 4.—With a membership closely hunting the 400 mark, the approaching election of officers of the Quaker City Motor Club, at the Hotel Majestic, is arousing great interest. There is a contest for every office but that of secretary, there being no less than twenty candidates for the nine board memberships. There are three aspirants for the presidency—Charles J. Swam, E. H. Woodman and Nathan T. Folwell, 2d. George H. Smith and Fred T. Chandler will clash for the first vice-

presidency. C. C. Fidler, Jr., J. J. Martin and Nathaniel Hathaway are having a hot battle for second vice-president. For treasurer A. T. Stewart and George T. Thompson are the candidates, while "Dory" Creamer will have a walkover for the secretaryship.

Pittsburgers Will Listen to Practical Talks.

PITTSBURG, PA., Feb. 4.—The Automobile Club of Pittsburg has adopted a novel method of getting new members this spring. Committees of the club are now arranging for a series of lectures on different automobile topics that will be of practical benefit to both dealers and owners of machines. A demonstrator from the different factories will be invited by the club to be present at these lectures and will take the cars apart and otherwise demonstrate the most practical way of getting along with an automobile cheaply and safely. The purchase of a ticket to this series of lectures will entitle the buyer to membership in the club, according to the plans now being shaped up.

Autoists to Organize in Pennsylvania Capital.

HARRISBURG, PA., Feb. 4.—Over a hundred autoists of this city and vicinity met last week and outlined plans for a new automobile club, the constitution and by-laws for which will be formulated without delay. More than 250 automobiles are owned and operated in this city, and with owners of the surrounding towns and newcomers for 1907 it is hoped to have an enrollment of about 500 members. The club is to be very broad in its scope and will take in members who do not own or operate automobiles but who are interested in good roads. At the meeting plans were discussed for the betterment of the roads in the Harrisburg district.

Williamsport, Pa., Organizes an Automobile Club.

WILLIAMSPORT, PA., Feb. 4.—The Lycoming County Automobile Club, with forty charter members, has been organized here, and the following board of officers elected for the first year: President, James B. Krause; vice-president, C. LaRue Munson; treasurer, Charles D. Wolfe; secretary, F. Grant Sweet; captain, J. Walton Bowman. Five members were selected as a board of governors, three as a touring committee, and seven as a legislative committee. Among the members are the most prominent citizens of this city. The erection of a suitable clubhouse is contemplated in the near future.

BRIEF CLUB ITEMS OF INTEREST.

BROOKLYN.—Thirteen new members were added to the rolls of the Long Island Automobile Club at its last monthly meeting, Wednesday, January 30.

CLEVELAND.—The meeting of the Ohio State Automobile Association, originally scheduled to be held in this city during the week of the local automobile show, February 18-23, has been postponed till the early part of March.

BINGHAMTON, N. Y.—Sixty-five covers were laid at the annual banquet of the Binghamton Automobile Club, at the new Armory building, January 29, and the guests included the most prominent automobilists and citizens in the vicinity. An elaborate menu was served.

BUFFALO.—The first annual meeting and banquet of the Motor Boat Club of Buffalo was held at the Markeen Hotel a few nights ago. Flag officers elected for the coming season were: Commodore, U. L. Caudell; vice-commodore, C. A. Criqui; rear-commodore, H. A. Brundige. The four new directors are: Dr. W. Scott Renner, George J. Metzger, J. F. Ellsworth and A. B. Schultz. Plans for the erection of a new clubhouse on Frog Island were laid before the club by Maj. Metzger.

THE AUTOMOBILE CALENDAR.

AMERICAN.

Shows.

- Feb. 11-16.....—Detroit, Mich., Sixth Annual Automobile Show, Light Guard Armory, Tri-State Automobile and Sporting Goods Ass'n. E. E. McMasters, mgr.
- Feb. 18-23.....—Buffalo, Fifth Annual Automobile Show, Convention Hall. D. H. Lewis, manager, Teck Building.
- Feb. 18-23.....—Cleveland Automobile Show, Central Armory, Cleveland Automobile Trade Association. George Collister, manager.
- Feb. 18-25.....—San Francisco, Golden Gate Park Skating Rink. Automobile Show, Dealers' Association and Automobile Club of California.
- Feb. 25-Mar. 2...—Portland, Me., Second Annual Automobile and Power Boat Show, The Auditorium.
- March 2-9.....—Chicago, Second Annual Power Boat Show, Seventh Regiment Armory. W. C. Andrews, manager, 19 E. Huron St.
- March 2-9.....—Minneapolis, Automobile Show, First Regiment Armory, Minneapolis Automobile Dealers' Ass'n.
- March 4-10.....—Kansas City, Mo., First Annual Automobile Show, Convention Hall. Frank L. Woodward, manager, Willis Wood Theater Building.
- March 9-16.....—Boston Automobile and Power Boat Show, Mechanics' Hall and Horticultural Hall, Boston Automobile Dealers' Association. C. I. Campbell, mgr.
- March 13-16.....—Omaha, Auditorium, Second Annual Automobile Show, Omaha Dealers' Association. T. Gillan, manager.
- March 18-23.....—Providence (R. I.) Automobile and Power Boat Show, Infantry Hall. F. M. Prescott, manager.
- April 1-6.....—St. Louis, Mo., Automobile Show, Jal Alai Building, St. Louis Automobile Dealers' Association.
- April 6-13.....—Montreal, Canada, Second International Automobile and Sportsman's Exhibition. R. M. Jaffray, manager, 309 W. Notre Dame Street.
- April 8-13.....—Pittsburg, Pa., First Annual Show of the Pittsburg Automobile Dealers' Association, Duquesne Garden.

Race Meets, Hill Climbs, etc.

- Feb. 22.....—Los Angeles, Cal., Pasadena-Aitadena Hill Climb, Automobile Dealers' Association of Southern Cal.
- Feb. 22.....—Atlanta, Ga., Hill Climb, Atlanta Automobile Association. F. E. Rushlander, secretary.
- Feb. 22.....—Washington, D. C., Aerial Race, Aero Club of America.
- May 30.....—Philadelphia, Hill Climb, Quaker City Motor Club.
- Oct. 19.....—St. Louis, Mo., International Aerial Race for the Gordon Bennett Prize. Aero Club of America.

FOREIGN.

Shows.

- Feb. 1-9.....—London, Crystal Palace Motor Show.
- Feb. 16.....—Turin, Italy, Automobile Show.
- March 1-16.....—London, Olympia Commercial Vehicle and Motor Boat Show.
- April 6-13.....—London, Agricultural Hall Motor Show.
- May 4-15.....—Madrid, Spain, Automobile Exhibition, Palace of Fine Arts, Royal Automobile Club of Madrid.
- May 15-26.....—Zurich, Third Annual Swiss Automobile Show.

Race Meets, Hill Climbs, etc.

- Feb. 23-27.....—Volturette Contest, Automobile Club of Italy.
- March 20-27.....—Nice (France) Automobile Week.
- April 1-15.....—Spring Wheel Competition.
- April 21.....—Targa Florio Tour (Stelby), Auto Club of Milan.
- April 25-28.....—Touring Contest, Automobile Club of Touraine.
- April 28.....—Chateau Thierry Hill Climb.
- May 24-27.....—Volturette Contest, Automobile Club of Austria.
- May 29-June 1...—Irish Automobile Club Reliability Trials.
- June 3-12.....—Herkomer Cup, Automobile Club of Bavaria.
- June 14.....—German Emperor's Cup, Taunus Circuit, Imperial Automobile Club.
- June 24-29.....—Scottish Reliability Trial, Scottish Automobile Club.
- July 1-July 8...—Grand Prix, Automobile Club of France. (Exact date to be decided upon.)
- July 14, 1908...—Paris to London Aerial Race.
- Aug. 11-20.....—Coup d'Auvergne, France.
- Aug. 18-22.....—Ardennes Circuit (Belgium) and Coupe de Liedekerke.

NOW COMES THE AUTO DOG.

"Automobile dogs" constitutes a new classification in the kennel world. Not all kinds of dogs, however pretty they may be, are suitable for the front seat of a stylish limousine. If you have a dog for your auto you must use discretion à la mode in the selection. The auto dog is in the first place an ornament. He is an *article de luxe* and adds considerably to the much desired impression that his owner must be a *costaud*, a swell, for whom expense is a pure pleasure.

The Pomeranian has been elected auto dog. He is called a Pom or a loulou, just as you like, but he always is of that perky spitz species, now so high in public favor—in Paris, at any rate. None other but the Pom will do. A pug or a Scottish terrier or a hairless toy tyke, sitting on the seat beside the chauffeur, would be considered shockingly bad form. The auto Pom ought to be white, to present a striking contrast to the somber shade of the



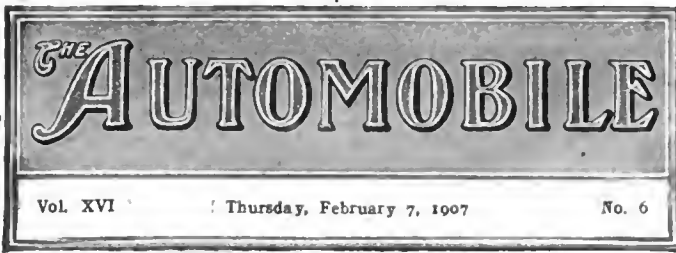
"MORAT" DISPLAYS GREAT DIGNITY IN HIS VOCATION.

coachwork, and, in order to remain ever white and fluffy, he should not sleep in the garage.

Many dark red or chestnut-colored Poms are used on Parisian automobiles. More white ones would be used if they were more plentiful, but the supply of Pom products from Germany is limited, and the majority are red or black. One of the "most prominent Poms" in Paris is "Morat," who sits on the front seat of Marquis de Dion's automobile, at the side of Zélélé, the chauffeur. Morat is pure white, and Zélélé is Nubian black. Morat is recognized as being the "correct thing" in auto dog styles. The auto dog, besides being the beacon of beauty at the head of the auto, is useful. He guards the vehicle during the chauffeur's absence.

MINOR PERFECTION COMPETITIONS.

Inventors are invited to devote their attention to the minor perfection of the automobile by four competitions announced by that active French body, the Association Générale Automobile. Prizes are offered for the best apparatus to prevent the stealing of automobiles; the best apparatus for showing what is happening behind the car; the best apparatus for hearing sounds coming from the rear, and for an apparatus to measure the quantity of gasoline consumed by the motor.



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The Chicago Show Must Be Stamped a Success. With characteristic Western breeziness, and quite in keeping with her well-earned reputation for doing big things, Chicago has successfully achieved what her most able rivals must concede is an effort well worthy of her and a great surprise to the industry which it represents. The Chicago show is, in brief, a revelation. When the curtain was withdrawn early Saturday afternoon, there could be no doubt in the minds of even the "show wise" that here was something well worth coming far to see, and indeed it is. No effort has been spared to make it second to none, which means ahead of anything that has ever been attempted, whether in the West or elsewhere. It is a scene to delight the eye and please the artistic sense, for seldom has such an appropriate setting been prepared for the automobile. And the jewel—the automobile itself—is truly national. It is, in short, the American product from that truly horseless buggyabout native to the middle western soil to the palatial creations of the best known and old established makers in every part of the land. The same is true of the men who devise and manufacture the multitude of things which conduce to the comfort and well being of the autoist, as well as his car. There is absolutely nothing lacking to make the showing as complete as it has ever been the lot of the American enthusiast to find gathered under the same roof, or rather two of them, for Chicago has not one, but two complete and interesting shows.



The Vital Question of Tire Values. Perfection in construction and operative qualities of automobiles has reached such a high standard that the arrangement of a well-defined touring schedule may be made by any automobilist with a

reasonable surety of the same being carried out—with the exception of the tires. This is a subject closely allied to the autoist's pocketbook. What tires shall be fitted to the car? To the experienced owner this question is non-debatable. With him price does figure, quality is essential, and he knows from costly experiment that a tire of unknown quality is expensive at any price. With the automobiling novice exterior appearances in tires are much the same, and his safeguard is to purchase his wares from reliable makers, or their accredited representatives.

This year crude rubber is dearer than it has ever been before, with every prospect of advancement in price as the season progresses. Some tires will be cheaper, but will the automobilist benefit? Will the manufacturer reduce the price and improve the quality? Bicycle tires can be purchased for a couple of dollars a pair, but the standard makes, those made by manufacturers to wear, cost more than they did several years ago, when the sale was greater, and are more in demand than the cheaper grades.

Notwithstanding the increased price of rubber, automobile tires are cheaper to-day than they have ever been, not in actual price, but in wearing qualities. Manufacturers of tires of standard makes are spending fortunes to improve their products, and the coming year will demonstrate tires that last longer, wear better, and give less trouble than ever before, and the automobilist who insists on tires of known value on his car will appreciate this at the end of the season.



Talking Points Should Become Unnecessary. In the last analysis, what is the one thing most sought after by the purchaser of a car? Is it the glamor of fine finish and polished parts that takes his fancy and decides his choice, or is it the certainty of reliability in action, and, what is equally important, durability, that led him to prefer one make rather than another? The question may be answered equally well one way as the other, and such will continue to be the case as long as human nature remains what it is. Just as a woman makes her choice because the upholstery of the car is such a "lovely" shade of fawn, so many a more practical purchaser finds his admiration aroused by the exterior finish of the motor or the presence of some particular feature of construction which he favors, and ignores all other essentials in making his selection. Entirely too many makers continually strive to keep their productions in the limelight by virtue of the "talking" points with which they cover them. They make the mistake of pandering to the perverted taste of the buyer who considers the car that is covered with new gimcracks every year as being representative of the most advanced type.

"What's new on your car this year?" is a query that is heard all too often at the shows, and unfortunately a failure to respond to it by revealing some marvelous and alleged revolutionary departure that is claimed to place it years ahead of all others, gives this type of buyer the impression that the builders of that particular car have fallen into a rut from which they are unable to emerge. The conservatism which benefits from experience and clings to what time and service have shown to be fundamentally and mechanically correct, is erroneously regarded as lack of progressiveness. Education must be gradual to be sure, and that it has not been more rapid or widespread in this particular respect is largely due to the attitude of the manufacturers themselves. The almost total abandonment of the preceding year's work in favor of something radically different that was uncovered for the first time at the annual show was the natural concomitant of the unsettled state of early days. There are too many makers, however, who have not yet come to a realization of the fact that those days are a thing of the past.

Meretricious "talking" points are now more apt to disparage a car than otherwise—it is a natural conclusion that its sale depends upon them, and they have absolutely no other *raison d'etre*. They still appeal to a certain class of buyers, and probably always will, but education is constantly thinning its ranks. It may be added that one of the best known cars made still embodies the principal features of construction that distinguished it six years ago—it runs—and that is what sells it. No mere talking or selling points are required.

A. A. A. RACING BOARD FOR 1907.

Following out the policy of centralization inaugurated by President Hotchkiss, the 1907 Racing Board of the American Automobile Association is much smaller than the board of last year. Chairman Jefferson de Mont Thompson has received a well-deserved recognition of efficient service in his re-appointment to that responsible position for another term, his colleagues on the board being William K. Vanderbilt, Jr., E. R. Thomas, Dave Hennen Morris, Frank G. Webb, A. G. Batchelder, S. M. Butler, all of New York; A. R. Pardington, Brooklyn; R. L. Lippitt, Providence, R. I.; George L. Weiss, Cleveland, Ohio. Frederick H. Elliott, secretary of the A. A. A., will act in a like capacity for the Racing Board.

A. L. Riker, Bridgeport, Conn.; E. R. Thomas, Buffalo, N. Y.; and Henry Ford, Detroit, Mich., will continue their duties as technical advisors to the board, and to their number has been added J. J. Mann, Paris, France. Mr. Mann resides in Paris and is chief engineer of the Hotchkiss Gun Factory and designer of the Hotchkiss car. He is a member of the Automobile Clubs of France, Germany and Great Britain, and of the Touring Club of France.

There is scarcely any doubt but that the Vanderbilt Cup race will again be run in this country this year. The Automobile Club of Italy, which has first claim on the Cup contest by reason of the French Club's refusal to officially participate in the race, is in favor of having the race run here, and this desire is also shared by the Italian manufacturers who have entered cars in the past races. There is no doubt that the German Club also wishes to have the race decided on American soil. While in Europe, Mr. Vanderbilt will make a careful study of the regulations governing the 1907 Grand Prix of the Automobile Club of France, and also the rules for the Targa Florio in Italy and the race for the German Emperor's Cup. He will present the result of his investigations at the first meeting of the 1907 Racing Board, which will be held soon after his return to this city.

GRAND PRIX LIST STILL GROWING.

PARIS, January 27.—Engagements for the Grand Prix of the Automobile Club de France now number twenty-two, the firms represented being Bayard-Clement, Darracq, Motobloc, Corre, Panhard, Renault, Lorraine-Dietrich, and Germain, all French, except the last named. Le Blon, who last year drove a Thomas car in the Vanderbilt Cup contest, has signed an engagement with the Panhard firm for the great French race next July. Heath will again pilot a Panhard. The third driver is said to be a sportsman who has not previously figured in big automobile races. The three Belgian cars, Germain, will be piloted by Perpere, Roch-Brault fils and Degrais, all three men who have yet to make their reputation in France. In eight days from this date the engagement list at ordinary fees will be closed. In the meantime it is expected that the Brasier firm will send along a cheque for three thousand dollars in order to have the privilege of running three Treffe à Quatre racers for the Grand Prix, and that Civelli de Bosch will do likewise. Foreign participation is not likely to be very numerous, but an appealing look is still being directed towards Mercedes, Fiat, Itala and Rolls-Royce. Two firms, Falconnet-Perrodeaud and Hutchinson, are now engaged in the tire competition to be run as an auxiliary of the speed contest. Neither of these two firms has previously been represented in an important French road race, and their appearance this year is a sure indication of fresh competition for the old guard—Michelin, Continental and Dunlop. There is every probability of the Seine-Inférieure being chosen as the scene of the Grand Prix, Dieppe and district having offered a subvention of \$20,000 to the A. C. F.

In its passing from a weekly publication into a monthly, *The Motor Way* says the industry has "no use for a weekly." Why not spell it with an "a" and bring out an annual—which will be often enough.

DATES FIXED FOR EUROPEAN TOUR.

On May 13 American automobile manufacturers will commence their pacific invasion of Europe. The committee in charge of the arrangements for the American Gold Cup tour has fixed upon this day as the date of embarkation for all machines entered for the 4,000 miles run over foreign soil. Entries for the tour will close on the first day of the same month, the entrants being confined exclusively to American made automobiles. Every car entered will be carefully examined by the technical committee in charge of the tour before it is permitted aboard ship, and the right to refuse any mechanically unfit vehicle is reserved. A number of picked mechanics from different factories will accompany the cars. After speeding over the highways of France, throwing up the dust of Italy, struggling through Germany, and exciting the curiosity of the automobile-loving Parisian, the machines will be shipped over to England. A run northwest to Liverpool, with naturally a pause in grimy London *en route*, will bring the travelers to the end of their journey. Before re-embarking a series of hill and speed tests will be held in the neighborhood of the great seaport.

Primarily a traveling exhibition of the American automobile industry—and as such it is opportune, for Europe is intensely interested in America's auto developments—the tour will be an excellent opportunity for seeing Europe to the best advantage. Paris will be reached at the height of its social season, the Grand Prix and the German Emperor's race will be witnessed, London will be visited during that brief interval when the city fog is entirely absent, and the run through France and other Continental countries is timed to have best weather conditions.

DE DION AGAIN DEMANDS TOURING TEST.

PARIS, Jan. 28.—The Marquis de Dion, vice-president of the Automobile Club of France, and a strong upholder of touring as against racing events has, undaunted by the failure of his huge touring scheme of last year, brought forth another plan for the development of the touring automobile. His programme is to send the touring machines off about the end of June on a lengthy tour in the southwest of France, to finish up with a run at high speed over a circuit in the neighborhood of Trouville in early September. Machines which have failed to maintain an average speed of 25 to 28 miles an hour in the touring test will not be allowed to start in the race, the classification of which will alone decide the winner. Freaks will of course be eliminated by the long distance to be run under purely touring conditions, and by the fact that the competing machines must weigh at least 2,750 pounds. The plan of a long preliminary run under touring conditions ending by a speed test for the survivors with perfect scores is one already frequently adopted for minor French contests with admirable results. It is the first time, however, that it has been proposed for an event of really great importance.

PARIS, Jan. 30.—The long-distance tour and race proposed by the Marquis de Dion has been received with enthusiasm by the French automobile industry. The competition will be for four-seated touring machines weighing not less than 2,750 pounds, with a maximum fuel consumption of 3.5 gallons per 62.1 miles.* A preliminary tour of about 2,000 miles will be made under purely touring conditions, and at a fixed minimum speed. Only cars having fulfilled the conditions of the long-distance tour will be allowed to participate in the final, which will consist of a 250-mile speed test over a circuit near the fashionable seaside resort of Trouville. An excellent course has been found, with long, straight, undulating stretches and ample width throughout. The final will be run in the month of August, at a time when Trouville and district is crowded with visitors. The trophy is to consist of a gold cup given by the Automobile Club of France, and a number of gold medals given by French newspapers to be incorporated in the cup. It will be known as "La Coupe de la Presse"—The Press Cup.

*The British Tourist Trophy race requires 87½ miles to be covered on 3½ gallons of gasoline.

FEAR FEATHER-WEIGHT RACERS.

PARIS, January 28.—First announced to the public but a few days ago, no time has been lost in drawing up the regulations for Grand Prix No. 2, or as it is now officially designated, the Sporting Commission Cup. In all essentials the regulations are akin to those governing the French Club's annual road race, excepting that the fuel allowance is reduced by one half. Thus, instead of 30 litres per 100 kilometers the Sporting Commission racers will be allowed but fifteen litres, or 3.3 gallons per 62.1 miles. The gasoline tank must be sufficiently large to contain the full amount of fuel allowed for the race. As the total distance is about 500 kilometers (310 miles) sixteen and a half gallons of gasoline will be carried. There will be no controls or neutralizations of any kind, and, as in the Grand Prix, all work on the cars must be done exclusively by the driver and his mechanic. A uniform type of gasoline tank must be adopted, a model of which will be issued to the competitors in due course. Although this point is not yet definitely settled, it is expected that the Sporting Commission Cup will be run the day before the Grand Prix. No weight limit is imposed. French critics regard this as the weak point of the race and attribute the lack of entries—three Gillet-Forest are the only machines officially engaged—to this clause. They ask that a minimum weight of 2,200 pounds be imposed. Rumor has it that one of the most important French factories will turn out a 50-horsepower machine weighing only 1,100 pounds (22 pounds per horsepower), consuming 4 3-4 gallons per 100 miles, and capable of 75 miles an hour. With such a low weight there would be very little tire trouble and the average speed for the entire distance would probably be higher than that furnished by the more powerful racers. The object of the Sporting Commission Cup was to allow the smaller firms, unable to build three special high power racers, to compete in an important contest, and at the same time to develop a type of machine having some relation to a standard touring car. Without a weight limit one of these objects would certainly be defeated. Hence a cooling down of the first enthusiasm for the Sporting Commission Cup.

ENTRIES FOR THE TARGA FLORIA.

Engagements up to date for the Targa Floria, the Italian national automobile race to be run on April 21, over a 400 miles course in Sicily, are as follows:

Fiat (4) Nazzaro, Weillschott, Lancia, —.
Itala (4) Cagno, Fabry, Graziani, —.
Dietrich (3) Duray, Rougier, Gabriel.
Gobron (3) Rigoly, Gobron, —.
Benz (3).
Lucia (2).

Darracq (2) Wagner, Hanriot.

The Targa Florio is a road speed contest for four-cylinder machines with a bore not less than 120 mm. or more than 130 mm., and for six-cylinder cars with a cylinder bore between 76 and 89 mm. A weight limit of 2,200 pounds is fixed for the minimum bore, with an allowance of 44 pounds for every millimeter above the minimum. In addition to the Cup or Targa to go to the winner, a reproduction in silver will be offered to every driver finishing a race, and \$7,000 in cash will be distributed among the first five arrivals.

LANCIA'S NEW AUTO FACTORY DESTROYED.

Lancia's proverbial ill luck has followed him even in his new business connections. Recently the daring Italian driver formed a company for the construction of a popular type of automobile and erected a large factory at Turin, Italy. A cable report just received from Europe announces that the new factory has been completely destroyed by fire. The damages amount to \$20,000. Three firemen were injured and many workmen have been thrown out of employment. Although Lancia has severed business connections with the Fiat firm, he will drive their cars in this year's prominent racing events, including the Grand Prix.

NEW BOOKS FOR AUTOMOBILISTS.

Hungary as Touring Ground for Americans.

Americans who contemplate a tour through Europe will certainly find something to interest them in the booklet published by the Guide Strangers' Inquiry Office, Vigado-Ter, Budapest, IV., entitled, "A Week in Budapest and Hungary." Of the thousands who annually visit the old continent, very few extend their excursions as far as Hungary. It is a pity, for Budapest has natural and architectural charms of a high order, and the banks of the Danube, the High Tatra, the famous Dobsina "Cave of Ice," and such Upper Hungarian watering places as Fenyohaza, Postyen, etc., have charms equal to any of the better known portions of Europe. Numerous illustrations and descriptive text give some idea of the charm of touring through this romantic country. American automobilists are assured of a hearty reception and every assistance in the matter of information from their colleagues of the Hungarian Automobile Club.

Alcohol and the Methods of Its Treatment.

"Distillation of Alcohol and Denaturing" (\$1 net) is the title of a 200-page book on a timely subject, by F. B. Wright, which has just been issued by Spon & Chamberlain. It treats of the various methods of producing alcohol as well as the numerous materials available for the purpose, including a chapter on alcoholometry. The subject of denaturing is gone into very thoroughly in connection with the Free Alcohol Act and the Internal Revenue Regulations.

A Dissection of the Automobile in Book Form.

What might aptly be termed "the automobile dissected," forms the subject of a convenient handbook just issued by John Wiley & Sons under the title of "The Complete Automobile Instructor." It is by Benjamin R. Tillson, director of the H. J. Willard Co. automobile school, who has put its contents in the form of a series of questions and answers. The motor and its various accessories are treated independently, making the volume convenient for reference. There are over 600 questions, with 50 illustrations, covering 213 pages; cloth, \$1.50; morocco, \$2.

STRINGENT LAW PROPOSED FOR INDIANA.

INDIANAPOLIS, IND., Feb. 4.—It was not expected that the present Indiana Legislature would attempt to change the automobile law passed two years ago. Most unexpectedly, however, a bill that would practically replace the present law has been introduced by Representative Frump, of Clay County. Mr. Frump bases his bill wholly on the complaints from his own county that drivers have not respected the speed law. There is no evidence, however, that any effort has been made to enforce the speed provisions of the present law. In the two years the law has been in existence there have been less than fifteen arrests in all parts of the State for various violations.

The bill now under consideration provides that automobiles shall slow down to three miles an hour in passing other vehicles, the present law providing a speed of eight miles an hour under such conditions. Automobiles must also slow down at crossings and curves, and the size of license numbers is increased from four to eight inches in height. Stringent penalties for violations are attached. The fine for the first offense is increased to a possible \$300, second offense to a possible \$800, and for the third offense a jail sentence of thirty days may be added.

Automobile men will be given an opportunity to appear before the Road Committee of the House of Representatives and discuss the bill. There is such a sentiment against fast driving in rural districts, however, that even if the bill is not passed, it will be reported favorably to the House by the committee and fought out on the floor.

WITH THE MOTOR BOATS AT PALM BEACH.

PALM BEACH, FLA., Feb. 1.—Cleaving the placid waters of Lake Worth like a thing of life, lithe-bodied *Dixie*, her sides smooth as glass, and her whole frame aquiver with the vibrations of her 133-horsepower engine, to-day placed the motor boat record for the nautical mile at 2:21.32. The trials were a fitting climax for a string of victories achieved by the *Dixie* in the four days of racing, and her owner, Commodore E. J. Schroeder, of the Motor Boat Club of America, is justly proud of her. On the first day an overheated bearing caused her to withdraw prematurely from the fray. The defect was promptly remedied, and when the meeting came to a close *Dixie* was on everybody's lips and her owner was the happiest man at Palm Beach. Three first prizes on the second day, two firsts on the third day, two more on the fourth day, and a record as a final *coup*, constituted a brilliant performance. But to take the events in chronological order.

Brilliant weather, an elegant crowd—and an enthusiastic one withal—watched the two morning and the three afternoon races of the opening day. *Katherine*, *Gray Wolf*, *Bruiser* and *Dixie* got away for the first race, distance nine nautical miles, for boats over 80 rating. Up to three-quarter distance *Dixie* appeared a winner; then her bearing warmed up, and she retired in order not to destroy her chances for the entire meet. J. Middleby, Jr.'s, *Katherine* carried off first prize, with *Gray Wolf* and *Bruiser* in her rear. In Class A, for smaller boats under 80 rating, there were ten starters, among them being several new comers. Smith & Mabley's *Simplex VIII.*, starting sixth, soon overhauled the others, and H. A. Broessel piloted her through to first place after a keen struggle with *Hot Stuff VI.* *Simplex VIII.* obtained another victory in the afternoon, when she beat *Possum*, *Hot Stuff* and *Baby Bullet*. All the small boats except *Hot Stuff VI.* started in a mixed race with the three big craft over a ten-mile course, in which *Simplex VIII.* again proved a winner, with *Katherine* and *Gray Wolf* a good second and third.

A collision between the *Bruiser* and the *Katherine* on the sec-

ond day gave a subject of conversation to the sensation mongers, but it was forgotten in the fine performance of the *Dixie* in covering ten miles in 22:08, thus establishing a Lake Worth record. In a five-mile race in the same class she won in 11:08. It was, however, in the fifteen-mile race, Class Z, that the *Dixie* showed her highest rate of speed, her time being 32:51, equal to almost 28 1-2 miles an hour, and not far from the world's record.

The *Dixie* had an easy task in the third day's events, for in the five-mile race *Gray Wolf* was her only competitor. *Dixie* gave her five minutes start, and won in 11:30. In another race at the same distance *Dixie* had a walkover, finishing in 11:20. A five-mile race for all boats, the best of the day, was won by W. V. Covar's *Planet*, the *Dixie* being second with a slight lead over *Simplex VIII.* The *Planet* captured first place in a five-mile race for Class X, with *Simplex VIII.* second, and *Errand Boy* third, out of seven starters. Lieutenant H. E. Willoughby's *Possum* won in a field of five boats in Class X, with the *Errand Boy* second, and *Baby Bullet* third.

On the final day excitement ran high, and when the trim, speedy *Dixie* captured the Sir Thomas Dewar trophy with a record for the nautical mile, her owner and her crew came in for a hearty burst of cheering. In a special five-mile race for the speedier craft, the *Dixie* again came out winner. The *Swallow* had a big start, and for some time it looked as if the *Dixie* would not be able to catch up to her. Inch by inch, however, she crept up to her opponent. During the last few seconds her bow showed in front of the *Swallow's*, and final victory was secured by barely a length. A twenty-mile endurance test, with all boats handicapped according to their performances, *Dixie* starting scratch, brought the regatta to a close. Her 133-horsepower, eight-cylinder S. & M. Simplex engine throbbing with perfect regularity, the *Dixie* covered the distance in splendid style, and added the Wanamaker Cup to her long string of trophies.

The *Dixie's* mean average of 2:21.32 was based on six runs over the measured mile, three being with the tide and three



SWIFT-MOVING "DIXIE" THAT PLACED RECORD FOR THE NAUTICAL MILE AT 2:21.32, MEAN CORRECTED TIME.



MAKING READY AT THE LANDING FOR THE RACES.

against. This record only very slightly surpasses that of the *Standard*, which on the Hudson last fall placed the nautical mile record with and against tide at 2.22. The difference in the conditions of the two tests will be realized when it is stated that between the *Standard's* runs with the tide and those against there is a variance of 24 seconds.

Summaries of the Regatta—First Day.

CLASS A. 80 RATINGS AND BELOW, 41-2 NAUTICAL MILES.

1. Simplex VIII., 30-h.p., Owners, Smith & Mabley
2. Hot Stuff.
3. Possum, 28-h.p...Owner, H. L. Willoughby
Also ran: Planet, Baby Bullet, Klots, Mera, Blanche, Errand Boy.

CLASS B. RATING 80 AND ABOVE, 9 NAUTICAL MILES.

1. Katherine, 40-h.p.....Owner, J. Middleby
2. Gray Wolf, 30-h.p., Owner, H. L. Willoughby, Jr.
3. Bruiser, 50-h.p.....Owner, J. K. Clarke
Dixie withdrew, with heated bearing.

CLASS A. RATING 80 AND BELOW, 41-2 NAUTICAL MILES.

1. Simplex VIII., 30-h.p., Owners, Smith & Mabley
2. Possum, 28-h.p...Owner, H. L. Willoughby
3. Hot Stuff.
Also ran: Baby Bullet, Blanche, Errand Boy, Mera, Planet.

CLASS B. 80 RATINGS AND ABOVE, 41-2 NAUTICAL MILES.

1. Gray Wolf, 30-h.p., Owner, H. L. Willoughby, Jr.
2. Katherine, 40-h.p.....Owner, J. Middleby
3. Possum, 28-h.p...Owner, H. L. Willoughby

CLASS C. ALL RATINGS, 9 NAUTICAL MILES.

1. Simplex VIII., 30-h.p.....Owners, Smith & Mabley
2. Katherine, 40-h.p.....Owner, J. Middleby
3. Gray Wolf, 30-h.p.....Owner, H. L. Willoughby, Jr.



"KATHERINE" LEAVING HER BERTH FOR STARTING LINE.

Second Day.

CLASS X, LESS THAN 30 FEET, 41-2 NAUTICAL MILES.

1. Mera, 20-h.p.....Owner, W. I. Huffstetler
2. Planet, 5-h.p.....Owner, W. B. Covar
Also ran: Blanche, Baby Bullet, Hot Stuff and Possum.

CLASS Y, MORE THAN 30 FEET, 9 NAUTICAL MILES.

1. Dixie, 133-h.p.....Owner, E. J. Schroeder
2. Katherine, 40-h.p.....Owner, J. Middleby
3. Gray Wolf, 30-h.p.....H. L. Willoughby, Jr.
Also ran: Kloto, Simplex VIII., and Bruiser.

CLASS X, LESS THAN 30 FEET, 9 NAUTICAL MILES.

1. Baby Bullet, 12-h.p.....Owner, G. J. Paddison
2. Mera, 20-h.p.....Owner, W. I. Huffstetler
Also ran: Blanche, Planet Errand Boy, Possum.

CLASS Y, EXCEEDING 30 FEET, 41-2 NAUTICAL MILES.

1. Dixie, 133-h.p.....Owner, E. J. Schroeder
2. Gray Wolf, 30-h.p.....Owner, H. L. Willoughby
3. Simplex IX., 30-h.p.....Owners, Smith & Mabley

CLASS Z, ALL LENGTHS, 131-2 NAUTICAL MILES.

1. Dixie, 133-h.p.....Owner, E. J. Schroeder
2. Gray Wolf, 30-h.p.....Owner, H. L. Willoughby, Jr.
Also ran: Blanche, Planet, Baby Bullet, Mera, Errand Boy, Simplex.

Third Day.

CLASS X, BOATS WITH LESS THAN 18 MILES SPEED, 41-2 NAUTICAL MILES.

1. Simplex IX., 30-h.p.....Owners, Smith & Mabley
2. Errand Boy, 12-h.p.....Owner, G. S. Andrews
3. Baby Bullet, 12-h.p.....Owner, G. J. Paddison
Also ran: Planet, Mera and Possum.

CLASS Y, BOATS WITH MORE THAN 18 MILES SPEED, 41-2 NAUTICAL MILES.

- Dixie, 133-h.p.....Owner, E. J. Schroeder
Gray Wolf did not finish.

CLASS C, ALL BOATS, DISTANCE 41-2 NAUTICAL MILES.

1. Planet, 5-h.p.....Owner, W. B. Covar



"SIMPLEX VIII.," THAT WON A STRING OF VICTORIES ON LAKE WORTH.

2. Dixie, 133-h.p.....Owner, E. J. Schroeder
Also ran: Blanche II., Mera, Possum, Simplex IX., Gray Wolf.
- CLASS X, BOATS UNDER 18 MILES SPEED, DISTANCE 41-2 NAUTICAL MILES.**

1. Possum, 28-h.p.....Owner, W. L. Willoughby
2. Simplex IX., 35-h.p.....Owners, Smith & Mabley
3. Errand Boy, 12-h.p.....Owner, G. S. Andrews
Also ran: Meteor, Baby Bullet, Blanche II.

CLASS Y, BOATS EXCEEDING 18 MILES, DISTANCE 41-2 NAUTICAL MILES.

1. Dixie, 133-h.p.....Owner, E. J. Schroeder

CLASS Z, ALL BOATS, DISTANCE 131-2 NAUTICAL MILES.

1. Meteor, 10-h.p.....Owner, J. P. De Berry
2. Blanche II.
3. Simplex IX., 30-h.p.....Owners, Smith & Mabley
Also ran: Baby Bullet, Mera and Swallow; Dixie withdrew.

Fourth Day.

CONSOLATION RACE, 41-2 NAUTICAL MILES.

- Gray Wolf, 30-h.p.....Owner, H. L. Willoughby, Jr.
Errand Boy, 12-h.p., owner, G. S. Andrews, did not finish.

SPECIAL RACE, 41-2 NAUTICAL MILES.

1. Dixie, 133-h.p.....Owner, E. J. Schroeder
2. Swallow, 30-h.p.....Owner, C. J. Swain
3. Gray Wolf, 30-h.p.....Owner, Hugh L. Willoughby, Jr.
4. Katherine, 40-h.p.....Owner, J. Middleby

ENDURANCE RACE, 18 NAUTICAL MILES.

1. Dixie, 133-h.p.....Owner, E. J. Schroeder
2. Gray Wolf, 30-h.p.....Owner, H. L. Willoughby, Jr.
Also ran: Blanche, Planet, Mera, Baby Bullet, Swallow.

NAUTICAL MILE RECORD TRIALS.

Dixie made six trials, three with the tide, three against the tide; best time with tide, 2:19; best time against tide, 2:21 1-5. Mean corrected times, all trials, 2:21:32.

SHOWN FOR THE FIRST TIME IN CHICAGO.*(Continued from page 273)*

Monarch Motor Car Company, 404 Monadnock Block, Chicago.—The company reorganized under this name and which has established a modern plant for the manufacture of cars at Franklin Park, Ill., is showing an improved form of light-weight and speed general service runabout, which resembles its predecessor in name only. The two-cylinder horizontal opposed engine, with the Monarch air-cooling device, rated at 14-horsepower, is placed transversely at about the center of the chassis on a reinforcing frame connecting the side spring members, which in turn connect the front and rear axles. This strengthening frame also supports the planetary gear as well as the bearings for the propeller shaft, thus making a unit power plant. Ignition is by jump spark through timer and double coil, using dry cells, control both of spark and throttle being placed on stationary sector over steering wheel. Lubrication is by compression grease cups throughout with exception of cylinder oil cups. The wheel-base is 78 inches, tread standard, and 28 by 3 inch wheels are employed on which the buyer has an option of 3-inch Good-year Universal Detachable tires or 2 1-2-inch cushion tires. The weight of the complete car is 750 pounds. With a piano box body, leather upholstered and full tool and lamp equipment the car lists at \$600 or \$650 with top; the Stanhope or type B with 45-inch seat and best leather upholstery and top lists at \$800; a Victoria, type C, at \$850, and Model E, with complete equipment, at \$900. In addition to these a light delivery wagon with a 1,000-pound capacity, is listed at \$750. It is made with any style top or body desired.

Western Malleable Steel Company, Detroit, Mich.—Castings and drop-forgings for automobile and motor boat use are produced by this firm on a large scale. Their plant at Detroit, which has now been in operation a little over a year, has been designed with a view to providing every modern facility for turning out this class of work on a large scale, and the favorable attention its products have received has more than fulfilled the anticipation of its sponsors. The malleable steel castings specialized by them are made from iron imported especially for the purpose, which when refined for the end in view, produces castings true to pattern, solid, tough and homogeneous, easy to machine and difficult to break by bending or twisting. By this process they have succeeded in turning out gear blanks from 2 to 24 inches in diameter, absolutely solid and free from blow holes. They are also equipped to turn out high grade gray iron castings, such as are required for cylinder work, pistons, rings and tool needs, using a dry-sand molding process that meets all requirements. The tool department is fitted out with every modern facility for die stamping, and drop-forge room has 24 presses ranging from 1,000 to 3,500 pounds, permitting of the production of one piece front axles, one piece six throw crankshafts in any material, including nickel chrome steel. They are also equipped with every facility for pattern-making and can undertake the production of special parts from beginning to end.

National Sewing Machine Company, Belvidere, Ill.—This firm controls the well-known Crandall system of lubrication for high speed machinery which is especially adapted to the needs of the auto and motor boat. Its utter simplicity, as well as its "foolproofness," are the chief recommendations of the Crandall lubricator. There is but one large pump, instead of multiplicity of small and vexatious parts; it is set to furnish a much greater quantity of oil than is required for the feeds, and needs no adjustment, the surplus passing through a pressure valve which is absolutely positive in its working, and which is permanently set at the factory and

placed in a part of the machine where the man afflicted with "tinkeritis" cannot reach it. One of the claims made by the makers is that the sight feeds of the Crandall will not "back down" or "cloud the glasses," as it is commonly called, while the lubricator is idle. That is, the glycerine or water in the sight feeds is positively retained. Its working is instantaneous, for as soon as a drop of oil is forced into the liquid sight feed, which is of highly ornamental design, a corresponding drop passes through the check valve and to the bearing. All the feeds are constantly maintained full of oil by the automatic check valves.

Excelsior Supply Company, Chicago.—Among the numerous specialties shown by this concern and for many of which it is the exclusive, either in Chicago or the Middle West, are the "B" line oil guns, "the handy gun for unhandy places," some of the best types of which are the "Back Bay," the "Broadway," the "Boulevard" and the Boston combination oil and grease guns, as well as the "Bourse Primer," which is a handy thing to have along for starting cold weather. Then there are the "Dure" Ignition accumulators, made by the Chicago Battery Company, which company also makes auto and motor boat annunciators, ignition and lighting wire, lighting dynamos, searchlights, front, dash, dome and tail lights, beside a number of others for special purposes. The "Stapley" compound tire pump, with pressure indicating gage, is another that has come in for considerable favorable comment. In the field of speed and distance recording instruments, they show the Winchester "speedodometer," combining a trip and season mileage recorder and a speed indicator, working on the centrifugal principle. These instruments are thoroughly tested for every point of the card of their calibration, so that the makers guarantee them to be absolutely accurate at every mile or fraction from one to sixty miles per hour. Permanent lubrication is provided for in their making, so that no further oiling is necessary.

Auto Accessories Manufacturing Company, Chicago.—As its name indicates, this concern manufactures a number of specialties in the shape of auto accessories, on many of which it is the patentee, such for instance, as its patent adjustable lamp bracket, designed to fit any model car and to take any type of lamp with equal facility. Another is their adjustable extra tonneau seat, which can be taken apart in a few minutes and stowed away in very small compass when not in use. It is made with or without a folding back. The upright screws into a socket countersunk in the floor of the tonneau, and the seat proper screws onto the top of it; plain, they list at \$10 each, and at \$12.50 with folding backs. This firm is also the maker of the "sterling" mica spark plug and the Cadillac mica cores, designed particularly for use in the single cylinder cars of the latter make. Beside this, they manufacture acetylene gas headlights and generators, or "gas lamp" outfits, which are made in four sizes to suit the needs of any type of car, small or large.

Standard Lamp & Manufacturing Company, 43 South Canal Street, Chicago, Ill.—Lamps and searchlights, the former both for oil and acetylene, for all auto purposes, sums up the showing of this firm. One attractive novelty is a gas tail light in a rather odd and compact form, and designed to be used in connection with a generator or pressure tank. In addition to a complete range of headlights and searchlights in many novel forms and combining numerous ingenious improvements, they show square oil side and tail lamps and also electrics for all purposes, including dome lights for the limousine, as well as a line of lamps in all three classes for marine use, together with their corresponding generators. They are the makers of the "Superior" brazing compound.

Reliable Dayton Motor Car Company, 4515-17 Evans Avenue, Chicago.—This is one of the first of the real "horseless" buggy type of automobile to be specialized for the use of the farmer in the Middle West, and is in consequence already well known. It is equipped with a 15-horsepower two-cylinder horizontal opposed motor of the standard type, and is mounted on high, solid tired wheels front and rear, the power being transmitted by side chains from a countershaft placed well toward the rear, the height of the wheels carrying the chains well out of the dirt and mud. It has square steel axles of full elliptical suspension throughout, steer being by tiller with control levers on tiller post. Complete with top the Reliable-Dayton lists at \$600, and is coming in for no uncertain attention from the rural dwellers, who have come to town with their bank rolls to invest in a car.

Alvin, F. J., Monadnock Block, Chicago.—"Black Hawk" specialties are handled by Mr. Alvin, those exhibited including the "Black Hawk" dry cells, specially constructed to give high amperage and potential with great recuperating powers, and are made in three sizes and for various uses, listing at 35 to 80 cents each. Under the same title there are shown lines of battery connectors and ammeters and sundry other specialties pertaining to ignition.

J. H. Sager Company, F
Sager flexible springs and firm is showing the new skidding and enable a car faces. They are warrant simple and durable, and They list from \$7 to \$12 for tires and wheels, and extra placement, which is easily

Cullman Wheel Company, Chicago.—Beside being agent Whitney lines of chains, the of sprockets for automobile Cullman spur differentials. types for every conceivable either block or roller chain.

Hine-Watt Manufacturing Chicago.—Columbia lamps made by this company, who searchlights in a variety of at noted for their simplicity at state, "They are made on home

REPRESENTING THE COMMERCIAL SIDE A

Biddle-Murray Manufacturing Company, Chicago.—Though trucks made by this firm have been in use in this city for some time past, they were revealed for the first time at a show during the present week. The exhibit consists of a three-ton stake type of truck, although experience has shown that its capacity is considerably in excess of its nominal rating. The power plant consists of a standard four-cylinder vertical motor, mounted well forward, so as to come beneath the driver's seat; the transmission is by means of a selective type of sliding gear, with a final drive through heavy side chains, the motor, changespeed gear box, differential and countershaft all being mounted on a narrow, heavy frame of girder section steel extending the whole length of the car, while the load platform is carried on a separate and independent frame. The front axle is of I-beam section and the rear is a square bar of steel, the brakes being located in drums on the driving wheels; semi-elliptic springs of generous proportions constitute the suspension. As an illustration of what this truck is capable, it may be said that it has delivered a load weighing 6,500 pounds a distance of nine miles in 55 minutes total running time, which gives an equivalent of 29 1-4 ton miles at a total cost of 4 cents per ton mile, figuring the driver at \$3 per day, fuel \$1 per day, lubricating oil 60 cents, and tire wear per ton mile, 2 cents—an unusually creditable showing, and one that reveals in no uncertain manner the possibilities of this form of transportation.

Rapid Motor Vehicle Company, Pontiac, Mich.—This concern has devoted its attention very largely to the production of the gasoline-driven type of sightseeing car, or "char-à-banc" as the Frenchman puts it, and are not exhibiting some of the types they build at the show where they are located in a prominent position in the First Regiment Armory, but also have them running around the streets of the city to good purpose. They are all equipped with a standard power plant, of which the double-opposed horizontal motor, in an accessible position under the center of the chassis, is the chief feature. They are not strangers to the New York streets, either, as several of them have been in operation by the sightseeing enterprises of the metropolis for some time past.

Mitchell Motor Car Company, Chicago.—Grouped with the touring cars and other pleasure vehicles made by this company, is one of its medium capacity trucks, which has the distinction of being the only car of its kind on the main floor of the Coliseum, if the special auxiliary fire department wagon, with its shining brass chemical fire extinguisher tanks, shown by the Knox Automobile Company, is excepted. The makers of the Mitchell cars are not new entrants into the field of business wagon building, and it is evident that the experience they have had with vehicles of this type, as well as the close study they have devoted to the problem during the year or two that they have turned their attention in this direction, has stood them in good stead; their truck is not only a model of what this form of car should be, in that it combines the maximum of carrying capacity and room for loading with a minimum of machinery and dead weight, but it has also shown what it can do in long and extended service under severe conditions.

Knox Automobile Company, Springfield, Mass.—Though fire-fighting is hardly to be termed commercial, it is a most important field—the most important, in fact, and the marvel is that the possibilities of the motor vehicle for this service have not been realized sooner. With its exhibit of pleasure cars, the Knox Company is showing the auxiliary fire department wagon that has made Springfield, Mass., famous for its celerity in nipping incipient conflagrations in the bud, so to speak, and it is hardly necessary to add that this part of the exhibit is coming in for the very generous share which its novelty and importance merit.

Logan Construction Company, Chillicothe, O.—This concern is exhibiting in connection with its wide range of cars for pleasure use one or two types of commercial vehicles that are representative of the numerous forms which they build for business purposes, running all the way from the lightest class of high-speed delivery wagons, through medium capacity trucks, to those of the heavy order capable of carrying large loads at a very low rate of expense when compared with the same service under ordinary conditions.

FISK PRESENTS A NEW REMOVABLE RIM.

The old method when a tire emitted that unpleasant hissing noise indicative of a puncture, was to jack up the car, struggle heroically with the outer shoe, withdraw the air chamber and either repair it or replace it by another. The new method changes all that. With the latest Fisk device, when a tire has to be changed the car is jacked, bolts unscrewed, the deflated tire slipped off, another complete and fully inflated tire taken from its bracket, slipped on, the bolts screwed up, and in less time than it takes to tell it the auto is moving again. When the garage is reached the punctured tire is repaired, mounted and inflated ready for future service.

This Fisk removable rim, the latest production of the Fisk Rubber Company, of Chicopee Falls, Mass., an illustration of which is shown, consists of a specially constructed removable rim, to which any tire may be attached. The road wheel has a special steel rim, one edge of which is flanged to provide an abutment for the tire rim, the other edge being beveled to provide a recess for an expanding ring. The felloe



FISK DETACHABLE RIM WITH AND WITHOUT THE TIRE.

and expanding ring are pierced at intervals by bolts fastened so that they cannot fall out or turn. On the removable rim is a thickened center portion to provide a locking point. When the removable rim with its tire is placed in position the nuts are tightened, the ring expands, holding the rim tightly in place.

WELCH MAKES PROFITABLE FLORIDA RUN.

JACKSONVILLE, Fla., Feb. 4.—It is a pretty tough road that struggles over sand and through hammock land between here and Ormond—115 miles of the veriest apology for a highway. L. H. Perlman, the New York representative of the Welch Motor Car Company, was a prominent participant in the Ormond-Daytona meet, and on the return to Jacksonville he demurred at express charges of \$250 to get his American championship winner here in a hurry to get it on the Clyde Line boat for New York. Therefore he resolved to tackle the alleged road. The Welch left the Ormond garage at 5 A.M., and at 10:40 A.M. the sturdy car reached the steamer dock, 5 hours 40 minutes for the trying run and saving quite a few dollars for gasoline. Mr. Perlman is pleased with Florida, but like many others believes that the State should immediately begin the construction of through trunk roads, which will be the greatest investment ever made by the commonwealth and the means of bringing many automobilists to the "Land of Flowers" for the winter.

ATLANTA, GA., HILL CLIMB ON FEBRUARY 22.

ATLANTA, GA., Feb. 4.—After a long period of inactivity the automobilists of Atlanta have at last bestirred themselves and are now making plans for a hill climb—the first ever held in Atlanta—which will take place February 22.

The entries will be divided into classes and a special cup will be offered for the best record made in each class. It is also probable that there will be a free for all event for which a special cup will be offered.

FUEL TEST SUCCESSFULLY ENDED.

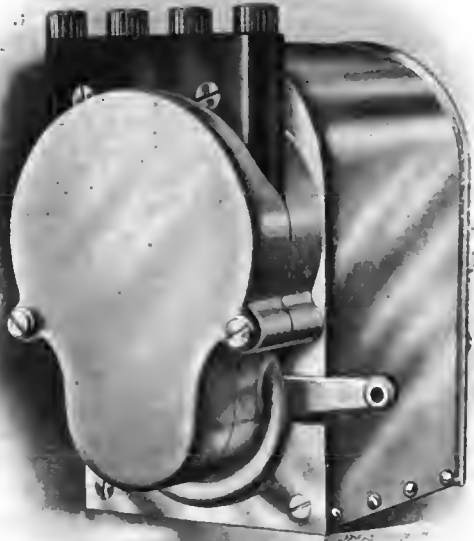
BOSTON, Jan. 30.—The three Maxwell touring cars, used by the Maxwell-Briscoe Motor Company, of Tarrytown, N. Y., in its test of the comparative merits of gasoline, kerosene and denatured alcohol as a fuel for automobiles, completed their trip from New York to this city this afternoon when they stopped in front of the clubhouse of the Bay State Automobile Association on Dartmouth street. The observers included S. Y. Beach, of the *Scientific American*; H. S. Sawyer, of the Automobile Club of America; John P. Slack, W. F. Schultz, and N. S. Dorley. Messrs. Beach, Sawyer and Schultz had charge of the compilation of data concerning the trip. H. A. Grant, who had charge of the test, said that when the data were worked out there would be made available much information of great value concerning the merits of the three hydro-carbons used in the test.



THE NON-STOP THOMAS PERFORMER WHICH ERNEST KELLY AND JOHN COWLING ARE DRIVING ABOUT CHICAGO DURING THE SHOW.

PITTSFIELD PRODUCES A NEW MAGNETO.

The Pittsfield Type F-2 high tension magneto just placed on the market by the Pittsfield Spark Coil Company, is one which for careful workmanship and correct design occupies the highest position. It is provided with distributor and advance and retard saprk lever. The distributor is designed in a manner to insure



NEW PITTSFIELD HIGH-TENSION MAGNETO.

against short circuiting and perfectly excludes dust, water, and moisture. The insulation in the distributor is of ample proportions and when the housing is screwed on it is rendered hermetically sealed. Very ample connections are made from distributor to plugs. The rotating part of the distributor, provided with Hess-Bright ball bearings, consists of the secondary shaft on which is mounted the secondary gear, and into which is fitted the insulator. On this is mounted the distributing brush holder provided with a carbon brush for contact. Best laminated iron is employed for the armature with two sets of windings, primary and secondary. The armature rotates in Hess-Bright ball bearings and is provided with a collector ring from which the current is collected by a carbon brush and delivered to the make and break at the low tension end of the machine on the armature shaft. At the high tension end is mounted the pinion which drives the rotating part of the distributor. The high tension end of the armature

shaft is bored its entire length to receive the rubber insulation through which is threaded the high tension lead from the secondary winding of the armature connected to the brass sleeve of the brush holder. Specially selected imported magnet steel is used for the magnets. The condenser has also received careful attention and is enclosed in an aluminum case. Simplification has been sought in the make and break apparatus, and all working parts are made of tool steel hardened and tempered. The platinum contact points are easily adjustable or can be readily removed and replaced.

TRADE PROSPECTS IN GRAND RAPIDS.

GRAND RAPIDS, MICH., Feb. 2.—The general trade in automobiles in Grand Rapids promises to be very active this year. Already there are seven large agencies in place of four last year, and two of these have more than doubled their floor space. The city now has four automobile manufactories, each making only high grade machines, one of them, just commencing, claiming many new features. No more luxuriously appointed cars are made in the country than are being manufactured by the Harrison Company, the Austin Automobile Company, and the Meenges Motor Company. The other manufacturers, the Couple-Gear Freight Wheel Company, confine themselves to the making of five-ton trucks. The Harrison automobile works is an outgrowth of the Harrison Wagon Works, and has been running two years.

The Meenges Motor Company is a new concern. Albert Meenges was at first employed by the Harrison people, but having obtained some new patents, he is now starting in the business of manufacturing for himself. He has temporary quarters, and thirty men at work. The car is to be a 100-horsepower machine, seating five to eight persons, and will cost from \$5,000 to \$7,000. One of the complete machines will be on exhibition within the next ten days. Some of the good points claimed for the Meenges are, that it will not be necessary to crank, it will be ignited by electric lights, and in the winter will be heated from the exhaust. In addition, the engine, instead of being attached to the frame of the car, is made to rest on coiled springs, it has a new transmission on the rear axle, and a direct drive on each speed.

The Couple-Gear company manufactured twenty-six trucks last year, but expect to work up to their full capacity this year, of one five-ton truck per week.

The strongest local organization here is the dealers' association which has just been formed. It has in view several reforms, one of which is a change in the ordinance requiring that cars travel at the rate of 8 miles an hour in the business section, even though it is up hill. Another thing desired is to get the Legislature to pass a law requiring every vehicle traveling after dark to carry a light both in front and rear to avoid accidents. It is the intention to get the City Council to act on this first, and after that induce other city governments in Michigan to join in the movement and induce the Legislature to take the same action.



STORY OF THE DEVELOPMENT OF THE WHITE STEAMER PICTURESQUELY TOLD BY EACH

WITH THE TRADE IN PITTSBURG.

PITTSBURG, PA., Feb. 4.—A busy season is ahead for automobile salesmen and firms in and about the Pittsburg district. Inquiries are double what they were last year at this time and in many instances early deliveries are being sought. Not only is the touring car attracting attention, but the motor for commercial purposes is being rapidly pushed to the front all through this district.

Although the district abounds in hills, yet the commercial vehicle is forging rapidly to the front. Several additions to the commercial line of trucks in the Pittsburg district were made last week.

The Hotel Schenley has established an automobile service between the hotel and all depots. The service is rather attractive and other hotels are looking with favor upon the scheme. The Schenley has a large Columbia car in service.

Six automobiles are to be purchased by the city of Pittsburg at a cost of \$30,000, and a garage at a cost of \$21,000, according to an ordinance which has passed the Select Council. These cars are to be purchased for park purposes. The idea is to buy six cars with a seating capacity of twenty each for touring the several parks of the city, mainly Schenley and Highland.

Large additions are under way at the garages of the Winton and the Liberty. They will be completed within six weeks, favorable weather prevailing, however.

NEWCOMERS IN THE PHILADELPHIA TRADE.

PHILADELPHIA, Feb. 4.—A new local concern, with the euphonious title of the Zim-Kel Motor Car Company, Inc., has just been formed to handle the Pungs-Finch car in this city. The new concern is capitalized at \$25,000, and the incorporators are Frank G. Zimmerman and Thomas F. Kelly, both well known in theatrical circles here. Quarters have been secured at 320 North Broad street.

The Williamson Motor Company, a West Philadelphia concern whose motors and marine engines are rapidly coming to the front, has established a New York branch to look after its export business. The factory at 812 South Thirty-ninth street, has been greatly enlarged and the adjoining premises secured and fitted up as a garage.

The Scull-Morris Motor Company, with salesrooms at 258 North Broad street, was established last week to handle the Aerocar and Acme in this city and adjacent territory.

The National Supply Company, 1630 Market street, has secured the local Orient Buckboard agency.

The Daimler Company has just closed with Fraser & Reynolds, 214-220 South Twenty-third street, to handle the American Mercedes in this city.

Brooklyn desires an automobile show. Claremont Avenue Rink is suggested as the place in which to hold it, and the week of March 18 proposed as date.

DIAMOND PRESENTS NEW ANTI-SKID.

A new anti-skid tire has been produced by the Diamond Tire Company, of Akron, O. Great care has been exercised in the design and workmanship of this tire and strong claims are put forth as to its resistance to skidding and also its strength to withstand the terrific strains to which a tire of this nature is subjected. Four parallel rows of steel studs are attached to the tread of the Diamond anti-skid tire, and by a special process are secured to extra piles of fabric within. No leather is used, but the fabric employed is manufactured to specifications calculated to meet to the best advantage the severe requirements of the office it performs. This new tire was shown to the public for the first time at the Diamond company's stand at the Chicago show, where it attracted considerable attention and much favorable comment. Nearly all types of American tires were on exhibition at the Diamond stand, including the Diamond Quick Detachable, Diamond Fisk type and others. The exhibit was a representative one.



DIAMOND ANTI-SKID TIRE.

TRADE ITEMS FROM TOLEDO.

TOLEDO, O., Feb. 4.—At its annual meeting the Toledo Auto Touring Car Company decided to sell \$10,000 worth of treasury stock, and with the proceeds purchase two sight-seeing touring cars, each having a capacity of 18 passengers. The present plan of the company is to operate all three cars on Sundays and other fete days, and during the remainder of the time to operate two, holding one in reserve. The concern elected the following directors: President, John Stolberg; vice-president, John C. Heidelberg; secretary and treasurer, Frank G. Crane.

The Union Supply Company, which for several years has operated a bicycle and rubber goods supply store on Superior street, has increased its capitalization, and in the future will also handle automobile supplies and auto accessories. J. G. Swindeman is president of the company.

According to W. S. Cranmer, one of the representatives of the Pope-Waverley Automobile Company, Toledo uses more electric automobiles than any other city of its size in the United States. He also says that the city has the finest and best equipped electric garages between New York and Chicago. His company sold 60 machines in Toledo last year.



YEAR'S MODEL SINCE 1901. COMMENCING AT LEFT AND READING SUCCESSIVELY TO THE RIGHT.

NEWS AND TRADE MISCELLANY.

The capital stock of the Perfection Spring Company, of Cleveland, O., has been increased from \$20,000 to \$50,000. Automobile springs are manufactured exclusively.

The R. H. Smith Manufacturing Company, of Springfield, Mass., has secured a patent covering the name of its speed indicator, the Springfield Motometer.

"The Bigness of Little Things," a Winton booklet, dealing with the importance of small matters in automobile manufacture, has been in such demand that a new edition has been issued.

A removal has been made by the Franklin Automobile Company from 1218 Michigan avenue, Chicago, to new and more commodious premises at 1450 Michigan avenue.

Realizing the need of especially careful design in the engine, the most vital part of the automobile, the firm of Illmer & Co., of Cincinnati, O., has entered the field of automobile engine design and offers expert service in this line to automobile builders.

John D. Rockefeller had his new Packard car equipped with the Truffault-Hartford shock absorber at the Hartford Suspension Company's factory this week. Mr. Rockefeller has used these shock absorbers on all his cars for the past three years.

The Hartford Automobile Parts Company's factory was slightly damaged by fire last week. The outbreak was confined entirely to the company's offices and assembling rooms, and did not interrupt the manufacture of the Hartford Universal joints to any extent.

A night force of workmen is now being employed by the Auto Parts Company, of Muncie, Ind. Only a short time ago the company removed from its old position on North Walnut street to Proud street and the L. E. & W. Railway. Indications are that additions will have to be made to meet with the ever-growing business.

The Okey Motor Car Company has been incorporated at Columbus, O., with a capital stock of \$25,000, to manufacture automobiles. The new officers of the company are Campbell M. Chittenden, president; A. G. Walton, general manager; F. R. Shinn, secretary and treasurer; Perry Okey, engineer.

A new branch has been added to the business of the Brooklyn Motor Car Company, in the shape of a large supply department. The store next to the one occupied at 1384 Bedford Avenue has been secured and will be so altered that the two will make practically one. E. P. Archer will have charge of the new department.

The Canada Cycle & Motor Company, of Toronto, has purchased in Ottawa the property extending from Sparks street to Queen street, on which is situated the stone building formerly occupied by the Perkins foundry. The building will be fitted up as a garage and show-rooms, and a repair shop will be built on Sparks street. The premises will be opened in the spring.

The Winton Company announces that it will shortly open its own branch house in Detroit. From this announce-

ment it is evident that the company finds the branch house plan profitable, for such establishments have been conducted for several years in New York, Boston, Philadelphia, Cleveland, Chicago and London; in addition a Winton branch was opened in Pittsburg about a year ago.

Baron Taranauke Furukawa, one of the leading financial and mining magnates of Japan, after covering the field of automobiles, has placed his order for a 50-horsepower Matheson touring car, which he will use in his extensive mining travels in his country. He is taking a course in mining engineering at Columbia University to qualify himself in regard to everything concerning the mining interests which he promotes.

The J. S. Bretz Company, of New York City, American agents for the firm of Fichtel & Sachs, Germany, have just received from the parent company a report of the great success with which the F. & S. annular ball bearings are meeting in Europe. Although very large manufacturers of ball bearings of other styles, it is only five years since Fichtel & Sachs gave their attention to the production of the annular type of bearings. In that period their annular bearing business has grown to enormous proportions, and they are to-day one of the largest producers of this class of goods.

At the annual meeting of the stockholders of the Witherbee Igniter Company, held at the company's New Jersey offices last week, the following directors were elected: Wm. Barret Ridgely, Albert A. Blow, Edward Ridgely, Allmand B. Elliott, David F. Plahn. The officers of the company for the current year are: Wm. Barret Ridgely, president; Allmand B. Elliott, vice-president and electrical engineer; Alfred S. Watson, secretary and treasurer; Albert J. Fisk, general manager. Thomas S. Witherbee, the former president of the company, is no longer connected with it in any way. The company will continue under its present name, the Witherbee Igniter Company.

Six cars per week—or one each day—are being shipped from the works of the Lozier Motor Company at Plattsburg, N. Y., and during February and March the output will be increased to eight per week. As the Lozier Company claim to make practically every part of the car from rough stock in their own works, this is an unusual product for a car of its class. The shipping facilities in the Lozier works are unexcelled. The railroad company has built its tracks into the large building used for assembling. A traveling crane operated by compressed air has a ten-ton capacity, and one man can, by its aid, carry a complete car from one part of the building to another with the greatest ease.

A novel and most effective method of testing transmissions and gears is that in vogue at the plant of the Electrical Vehicle Company at Hartford. A chassis is mounted on blocks, and the transmission set secured to its supports just as it is in the finished car. The transmission is coupled direct to a water friction brake. An electric motor, which revolves at a speed of from 500 to 1,500 revolutions per minute, is mounted in approximately the same position as that of the engine in the finished car. This motor is

coupled direct to the transmission. The motor is then run and the transmission set working against the resistance developed by the water brake does practically the same amount of work intended for it in the complete car. The different speeds are effected in the usual manner by change gear lever. The various speeds of the motor and transmission afford a most practical test of efficiency. So great is the friction developed in the brake that a circulation of city water working at a pressure of 80 pounds is necessary to keep the brake cool.

NEW AGENCIES ESTABLISHED.

The St. Louis cars will be handled in Kansas City, Mo., and vicinity this season by Cowie & Pierson, 1413 Grand avenue.

The Cook & Stoddard Co., of Washington, D. C., has secured the agency for the Darracq in that city. It is interesting to note that this is the first foreign car agency to be placed there.

The Dupont Garage Company, of Washington, D. C., has been appointed agent for the Waltham-Orient. The Rambler and Cleveland will be handled in the Dupont garage by George P. Sacks.

Bond Brothers Company, recently incorporated and located at 10 Columbus avenue, in the Motor Mart, Boston, has taken up the agency for the Deere car, manufactured by the Deere-Clark Car Company, of Moline, Ill., for the Boston territory. The Bond brothers are well known in the New England local trade.

PERSONAL TRADE MENTION.

E. H. Gato, the wealthy cigar manufacturer of Havana, has placed an order for a Winton X-I-V.

Charles B. Shanks, general sales manager of the Winton Company, will shortly go to Florida to recuperate from the la grippe atmosphere of the show season.

Charles S. Monson has been appointed manager of the Detroit branch of the G & J Tire Company, of which he has been acting manager for some months.

W. W. Partridge, a native of Massachusetts, and until recently connected with the insurance business, has removed to Cleveland and entered into the automobile line with Henry Moore, local agent for the Stoddard-Dayton car.

At the close of the automobile show Charles H. Martin severed his connection with the Knox Automobile Company, of Springfield, Mass., and has formed a partnership with Cecil H. Taylor, as consulting engineers for commercial automobiles. Their address is 29-31 West Forty-second street, New York.

RECENT INCORPORATIONS.

Conover Motor Company, Paterson, N. J.; capital, \$20,000. Incorporators, Edwin K. Conover, Alfred W. Watson and Samuel J. Watson.

American Pump and Motor Company, Chicago, Ill.; capital stock, \$500,000. Incorporators, Perry A. Thompson, Herman C. Straube and James M. Lynn.

Rainier Motor Car Company of Illinois, Chicago, Ill.; capital, \$20,000. To manufacture and deal in automobiles. Incorporators, John T. Rainier, Paul N. Lineberger and Edward Q. Gardner.

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JAMAICA AS JUST SEEN BY AN AMERICAN AUTOIST

ALL of us have long known that somewhere in the West Indies is an island called "Jamaica." As to just where it is and what it is like, few people—except those few who indulge in winter tropical trips—ever knew or cared until one day last month the cable brought the news that a disastrous earthquake had occurred there and had practically wiped out of existence the city of Kingston, the capital of the island. For two or three days we read of the disaster and of the relief measures being adopted, and then were stirred by the boorishness of Swettenham, the Governor of the island, who treated a representative of this government in such an unseemly manner. The attention of automobilists was attracted to a line in the news from Kingston to

the effect that "an automobile was doing splendid service in the work of relieving the sufferers." With the return to this country of Dr. William F. Bacon, of York, Pa., and his companions, not only are we informed concerning the part which the automobile played after the catastrophe, but also we learn that Jamaica has a claim upon the attention of autoists, such as few other localities possess.

Dr. Bacon, with three friends, sailed for Jamaica on the first boat which left New York after the earthquake. He was commissioned to find the body of one of his patients whom the first dispatches reported as being killed. On arriving at Port Antonio, on the north shore of the island, four days later, he re-



THE PRINCIPAL HOSPITAL CAMP IN THE OUTSKIRTS OF KINGSTON.—WHITE STEAMER STARTING ON ONE OF ITS MANY TRIPS.



THE U. S. CONSUL DID MUCH DESPITE THE IRASCIBLE GOVERNOR.

ceived the reassuring news that his patient was unharmed, and had, in fact, started for the States. And right here it should be made plain that the action of Governor Swettenham was in no way typical of the attitude of the other insular officials. No sooner had the Mayor of Port Antonio heard that a physician had arrived, than he came to see Dr. Bacon and besought him to lend his aid to the local physicians.

"I will do anything you want," replied the doctor, "and go anywhere you say."

"We have no accurate knowledge of conditions in the interior of the island," replied the Mayor. "The negroes report great loss of life in the landslides which occurred in the mountain districts."

"Have you a motor car handy?" queried the doctor, having in mind the necessity of quick transportation.

"The only car in town is Victor Camp's White steamer," replied the Mayor. "Camp's machine has been busy ever since the earthquake, but I guess he will accommodate you."

The Steamer Was a Time-saver.

In less than two hours after the doctor landed, he and his friends were on their way across the island in Camp's "steamer," with the owner at the wheel. As soon as they reached the mountain districts they found the negroes in a state of wild trepidation. Monstrous rumors were afloat regarding conditions, not only in the island, but also in the outside world. For example, one negro, the owner of a prosperous plantation, asked if it was true that the Isthmus of Panama had sunk into the sea. Actual loss of life or limb caused by the landslides had been very slight,



ONE OF THE EARTHQUAKE VICTIMS RECEIVING MEDICAL ATTENTION.

but still there was plenty of work for the doctor. Every physician in Jamaica had gone to Kingston immediately after the earthquake, and the rest of the island was entirely without medical aid. Mr. Camp's automobile carried two Red Cross flags, and their significance was appreciated by the natives. At every little cluster of huts some invalid would be brought forth for attention. The reverence of the simple folk for the doctor was very affecting. The families of the sick persons would approach the car on their hands and knees and beg that the doctor might effect a cure. Night came on while the party were engaged in their beneficent work, but such is the brilliancy of the tropical moon that the doctor continued to administer until his supply of medicine was exhausted. The car had started with a well-filled medicine chest strapped behind on the luggage carrier, but even this supply proved insufficient.

Finally, the tourists reached the Constant Spring Hotel, six miles inland from Kingston, and here they spent the night. In the morning Dr. Bacon and his companions reported for duty at the government hospital at Kingston, and here their labors began anew. The tired and overworked hospital staff had an immense range of territory to cover. Every day they had to make the rounds of the refugee camps and new cases in the outlying districts were daily requiring treatment. No means of transportation had been at their disposal, except donkey carts. Mr. Camp immediately put his car at the disposal of the hospital corps, and



RESIDENCE OF THE GOVERNOR WHO DECLINED AMERICAN AID.

thereafter every member of the staff was enabled to complete his work in about a third of the time previously required, with a consequent gain in the amount of time available for much-needed rest. Furthermore, as one of the staff expressed it, "A ride around the city in that car is as refreshing as a two-day furlough." It was also a great treat to the faithful Red Cross nurses, who had labored unceasingly since the earthquake, to go to and from their work in the swift and silent machine. Then there were medical supplies of all kinds to be distributed, and in this work, too, the machine proved itself just as useful as it did at San Francisco.

Finally, after four or five days of constant effort, the medical situation was brought into such satisfactory shape that Dr. Bacon and his party felt that they could, with justice, think of returning. Bearing with them an official letter of appreciation from the hospital authorities, the tourists started back toward Port Antonio, proceeding in a leisurely manner, and by a circuitous route, observing meanwhile the character of the country and of its inhabitants, particularly as regards the desirability of the island from the automobilists' point of view.

Jamaica Has Excellent Roads.

Naturally, the roads first commanded attention. It will be a surprise to people in this country to learn that in far-off Jamaica all roads are level and built of stone, and they reach every nook



EAST STREET, ONE OF KINGSTON'S THOROUGHFARES AS IT LOOKED AFTER THE EARTHQUAKE HAD DONE ITS DESTRUCTIVE WORK.

and corner of the island. The material used is a white stone, which is soft and crushes readily. This stone is very porous, and the heavy tropical rainfalls disappear from its surface almost instantaneously. Furthermore, this style of road is very easy on automobile tires. Mr. Camp's White has been over 10,000 miles on one set of tires, and he expects to get from them several thousand miles more of service. It is doubtful if any road in this country can compare with those which prevail throughout Jamaica. The entire interior of the island is very mountainous in character, yet the ridges are crossed by easy grades, and it has not been thought necessary to build "water-brakes," the bane of the autoist.

Another important point which the tourist noted was the security of life and property in



FIRST SHOCK STOPPED THE CLOCK.

the island. Jamaica has been a peaceable English colony since 1638, administered by an officer appointed by the crown. The English law, as well as the English language and customs, prevails in the island, and respect for the law is absolute on the part of the most ignorant inhabitant. The island is well patrolled by native constabulary, and the records of the local courts show that almost the only offenses are petty larceny cases.

An overwhelming preponderance of the population of the island is negroes, the descendants of slaves imported from Africa. During the last century there were brought from India a considerable number of coolies, who maintain their original religion and customs, and do not intermarry with the negroes. These interesting people are found in small



TROPICAL FOLIAGE IN PRODIGAL QUANTITIES IS FOUND IN THE INTERIOR OF THE ISLAND, WHICH CONTAINS EXCELLENT ROADS.



IT IS DELIGHTFUL ALONG THE SHORE ROAD BETWEEN PORT ANTONIA AND ARMOTTA BAY.

colonies throughout the island. Both the above classes are honest folk, and their attitude toward the automobile tourist is one of profound respect. The natives live in little bamboo huts, which are so well distributed over the island that one or more of these little homes is almost always in sight.

The roads lead past groves of banana trees or through orange or coffee plantations, and the numerous forms of strange tropical plants are a constant source of wonder and delight to the tourist. In the mountain districts the road very often parallels some beautiful stream with innumerable waterfalls. Every visitor to Jamaica, starting with Columbus, who visited the island in 1494, has spoken in unbounded praise of its great natural beauties.

Jamaica Has a Sensible Auto Law.

Jamaica has a motor-vehicle law, and it is one which the legislators of our States might well take as a model. To those who have had experience with our State Legislatures, it is a genuine surprise to learn that distant Jamaica should actually have in force at the present time a law such as we think of only as an ideal which may or may not be realized in years to come. The only speed limit stipulated in the Jamaica law is that "No person shall drive a motor car on the public highway recklessly, or negligently, or at a speed or in a manner which is dangerous to the public." The remaining provisions of the law provide simply for registration, for lamps, for "a horn or other instrument for giving warning," for the licensing of drivers, and for stopping in case of accident.

In still another way the Jamaican government has shown a more friendly interest in automobiles than have our State governments. Within the last two months the insular authorities have issued a complete and detailed guide-book of the roads of the island, giving the mileage and description of all the turns. In compiling this work, they used as a model the guide-book compiled for last year's A. A. A. tour, with the style of which most automobilists in this country are familiar. Efforts are being made by the Jamaican automobilists to attract American auto tourists.

As regards the destruction wrought by the earthquake, it should be stated that the damage was confined to Kingston and to the immediate vicinity. Before another year has elapsed even that city will again present its wonted commercial activity. It was, before the earthquake, the largest city in the British West Indies, having a population of over 55,000.

Although the climate of Jamaica is salubrious all the year round, the best months to visit the island are from December to March, inclusive. Tourists will find at Port Antonio as good a hotel as in any of the summer resorts of this country, and in many of the other coast towns are hotels which cater to the tourist traffic. The island may be reached from New York City by any one of three steamship lines; the Hamburg-American, the Royal Mail Steam Packet Company, and the United Fruit

Company. Port Antonio is about 1,440 miles from New York, and the voyage is made in four or five days. Within 24 hours after leaving New York, the traveler is in the midst of the Gulf Stream and is enjoying delightfully warm and balmy atmosphere.

Arriving at Jamaica, the custom-house formalities take only a few seconds, although on his return to his native country the traveler must be prepared for a long array of formalities.

From the foregoing description—of the good roads, of the friendly attitude of the government, of the attractions of a tropical country, and of the accessibility of the island—it is evident that Jamaica well merits the favorable attention of the autoist.

RANCHMEN TAKING TO THE AUTO.

FORT WORTH, TEX., Feb. 11.—Automobiles as means of travel to and from ranches located at some distance from railroads are becoming more and more popular in this State every day. A number of the large ranchmen of West Texas have now almost given up the pony in favor of the automobile. Trips over the ranches can be made for miles, the ground being smooth enough in most places for the machines to travel anywhere. Speed and comfort are both much greater than formerly.



A TYPICAL MOUNTAIN ROAD. FRINGED WITH BANANA TREES AND A WEALTH OF FOLIAGE.

CHICAGO'S SHOW WAS SUCCESSFULLY GRATIFYING

CHICAGO, ILL., Feb. 9.—With an attendance that crowded both Coliseum and Armory to capacity to-night the Chicago show ended its successful eight days and nights of telling the Westerners about the 1907 automobiles. It would appear from the attendance figures and numerous sales—especially the latter—that as long as shows continue there must be a national event in Chicago as well as in New York City. Manager Miles certainly sprang a surprise in the artistic dressing which he gave the two buildings, and to the exhibitors there was more gratification in the matter of attendance of agents from the middle and extreme West.

Herewith are some of the expressions of opinions from members of the N. A. A. M. Executive Committee:

Thomas Henderson, Winton Motor Carriage Company.—"I'm a veteran of three shows this season, so to speak. I was at Olympia in November and at the Garden in January, but I haven't seen anything to surpass this. I think it's the most creditable effort ever made in this country, whether in Chicago or elsewhere, and the thing that impressed me most forcibly about it is the fact that it is more in keeping than others have been. There is an atmosphere about it that was lacking at the Garden. It typifies the automobile more to my mind than the New York show did."

W. E. Metzger, Cadillac Motor Car Company.—"The Chicago show has been a great success, typical of the West, which is buying automobiles in far more generous quantities than ever before. And the Westerner takes a whole-souled interest in the auto which he makes no effort to conceal. He is out to see and take note, which is probably one of the reasons why the Western show is such a popular affair."

S. T. Davis, Jr., Locomobile Company of America.—"The Chicago show must be set down as one of the greatest benefits to the industry. The numerous sales tell their own story where the business end of the show is concerned, and as for the popular side of it, anyone who visited the Coliseum or the Armory any time during the week hardly needs to be told what a success the show has been from that point of view."

Benjamin Briscoe, Maxwell-Briscoe Motor Company.—"It has New York show beaten a mile, to put it in the vernacular, and my honest opinion is that this country has never seen

anything to equal it, much less to surpass it. It certainly does the industry credit and results in benefit that is felt the remainder of the year. This is the biggest thing Chicago has ever done, and that means the biggest that has ever been carried off in this country, to my way of thinking."

Ezra Kirk, E. R. Thomas Motor Company.—"I have attended shows of different kinds for the last ten years or more, but I have never seen anything in the line of an industrial exhibition that came anywhere near equaling this. It has all others that I can recall totally eclipsed from every point of view, and that is saying a great deal. It took the automobile as an incentive to show what could be done in that way, but in this case it has surpassed its own record manifold."

Windsor T. White, the White Company.—"Whether considered from the amount of business accomplished, the decorative setting, or the attendance, the Chicago show has proved a most gratifying success. It is by far the biggest thing ever attempted in the way of an industrial exposition by any organization, no matter how large or influential, and doubtless the present event will go down into history as having set a standard that it will be found difficult to surpass."

C. C. Hildebrandt, Stevens-Duryea Company.—"The show has undoubtedly set a high-water mark in every respect. Shows can hardly be bigger until buildings increase in size, and it is doubtful if there will ever be one roof capable of sheltering the industry, but this demonstrates what can be done both in quantity and quality. In my opinion there has seldom been a more creditable event carried off anywhere in this country."

William R. Innes, Studebaker Automobile Company, was of the opinion that the Chicago show was relatively an event of far more importance to the two-thirds of the country west of it than the New York show was to the one-third of the country between Chicago and the coast. "It seems to me that the show means more to Chicago than it does to New York, though, of course, I'm not a resident of this part of the country and cannot speak from the viewpoint of one," he added. "It is certainly a great success and more than fulfills my expectations."

A. L. A. M. ENGINEERS ELECT AND DISCUSS

CHICAGO, ILL., Feb. 6.—After the business of the annual meeting, held at the Chicago Athletic Association, and at which A. L. Riker was unanimously reelected president, and W. S. Clarkson continued as secretary, was disposed of, the engineers of the Association of Licensed Automobile Manufacturers and the representatives of the manufacturers who had been invited to attend, took up the discussion of carbureters, particularly with regard to the use of alcohol as a fuel. There was considerable difference of opinion expressed, both as to the availability of alcohol for automobile use as well as on the subject of carburetion generally. Following this there was a discussion on the subject of springs, with which was included a talk on clutches and shock absorbers, but the matter of suspension proved to be one of such absorbing interest that a very large part of the time was devoted to it. Experts from a number of steel and spring manufacturing concerns were present and gave illustrated talks on the subject of treatment of spring metals. It was conceded that the front springs were chief, if not only source of trouble.

During the informal discussion that followed, the fact was brought out that there will be several prominent contenders in the elimination trials for the Vanderbilt Cup this year who have not previously competed, as well as others who competed two

years ago and will again enter, the plans of the builders of the Royal Tourist being the most recent development in this direction. The trend of the discussion indicated that the subject of racing would be considered of far greater importance during the coming year than ever before. As it was not found possible to give the subjects above referred to the amount of time they deserve at the Chicago meeting, the discussion will be continued at the next monthly meeting to be held at the association rooms in March, and this will be supplemented by a discussion of the subject of racing, it being a matter of common knowledge that several high-powered cars are in prospect for this year's Vanderbilt. The following members were present:

Edgar Apperson.	Frank Johnson.	J. S. Worthington.
Elmer Apperson.	G. P. Barrett.	J. H. Jones.
W. H. Little.	J. A. Becker.	G. W. Bennett.
Reynolds Janney.	B. A. Becker.	A. L. Riker.
E. C. Sweet.	John W. Wilkinson.	A. W. Robinson.
F. W. Hawes.	F. M. Nutt.	A. C. B. King.
V. M. Gunderson.	G. N. Mismar.	C. C. Hildebrandt.
G. W. Gunn.	G. W. Haas.	C. H. Halkins.
Charles Clifton.	Robert Jardine.	George E. Sparks.
Daniel Ferguson.	Alden Sampson.	E. P. Chalfont.
Harold L. Pope.	George E. Mitchell.	H. D. Church.
W. G. Gilder.	E. T. Birdsall.	H. E. Coffin.

BRISCOE NOW LEADS THE INDEPENDENTS

CHICAGO, Feb. 7.—At the largest and most enthusiastic meeting in its history, the American Motor Car Manufacturers' Association in annual session selected Benjamin Briscoe, of the Maxwell-Briscoe Motor Company, as chairman of the committee of management for 1907. Mr. Briscoe has been a member of the association since its inception, and last year was chairman of the show committee. His remarkable strides in the motor car manu-



BENJAMIN BRISCOE,
Chairman A.M.C.M.A. Committee
of Management.



ALFRED REEVES,
Re-elected General Manager
A. M. C. M. A.

facturing field have made him one of the most important figures in the industry, the growth of which has astonished the world. James Couzens, of the Ford Motor Company, who has been chairman of the committee of management for two years, declined a re-election. In appreciation of the good work he has done, the association passed a resolution of thanks and elected him an honorary member of the committee.

That the association has been doing work for its forty members during the past year was shown by the report of Mr. Couzens and by the heads of the various committees. The chairman's report showed that the association has nearly doubled its membership during the past eight months, and the list of forty makers now holding membership is certain to be largely increased during the next few months. Optimistic reports were submitted by the treasurer and by the committees on membership, agencies, good roads, and legislation, standardization, runs and tours, freight and transportation, advertising and shows. A general feeling of satisfaction was expressed at what had been accomplished during the Couzens-Reeves administration.

The official report of the meeting contains this paragraph:

"The opinion was universal that the Chicago show being held in February is much too late for general benefits. It is neither a wholesale nor a retail affair, and there were many reasons advanced why it should be changed to November or December. This gathering of strength in favor of early shows (the original idea of which was first put into operation by the American Association) is gathering followers every day. Of course, if the Chicago exhibition was run in November or December it would necessitate a change of date for the Garden show in New York. The Grand Central Palace exhibition in New York last December was such a pronounced success from a business point of view—notwithstanding the talk of decorations, etc., these shows are held primarily for business and to stimulate the interest in automobiling—there seems no good reasons why the affairs should not be conducted in November or December. This will be especially apparent next fall with the fewer changes to be made on the 1908 models. The proof of this reasoning was offered by the report of the December show in New York, which, besides drawing a record number of exhibitors, an unprecedented attendance of agents and retail buyers, permitted a profit dividend of 45 per cent. in addition to an original discount of 20 per cent. to members of the association."

Three members were elected to serve three years on the committee of management: Benjamin Briscoe, Maxwell-Briscoe Motor Company; R. E. Olds, Reo Motor Car Company; H. O. Smith, Premier Motor Manufacturing Company. Roger J. Sullivan, of the Wayne Automobile Company, was chosen to fill the vacancy caused by the resignation of A. C. Newby, of the National Motor Vehicle Company, who asked to be relieved of association responsibilities to give more attention to his business interests.

After the general meeting the business session of the committee of management was held, when plans for an active year were discussed and the following officers chosen: Chairman, Benjamin Briscoe; vice-chairman, R. E. Olds; treasurer, H. O. Smith; auditor, Roger J. Sullivan, and general manager, Alfred Reeves.

It is understood that the American Association had some idea of shortening its name, and several variations were suggested, one of which may be adopted at some future date.

NEXT WEEK'S LOCAL SHOWS IN VARIOUS CITIES

CLEVELAND SHOW WILL HAVE "DOLLAR" NIGHT.

CLEVELAND, O., Feb. 9.—It has been decided to follow the lead set by New York at the Garden in January and have a "dollar night," the general admission during the evenings also being advanced to 50 cents. For the afternoon the admission will be 25 cents as heretofore. The big Central Armory is being tastefully decorated for the show which opens on Monday, February 18, and continues all the week, and improvements are being made in the entrances and the heating arrangements, so that the building will be more comfortable than it has been during previous shows. The conflict with Buffalo did not reduce the exhibitors' list.

ELECTRICAL DISPLAY AT BUFFALO'S SHOW.

BUFFALO, N. Y., Feb. 11.—It has been decided by the officials of the Automobile Club of Buffalo, which conducts the automobile show in connection with the local trade association, to be held in Convention Hall next week, February 18-23, that the principal decorative piece shall be an immense reproduction of the badge of the local club. This electrical piece will contain at least 1,000 incandescent lights and will be 15 feet in diameter. It will extend from the balcony to the girders of the building. In the center

of the hall will be placed a magnificent electric dome, containing about five hundred incandescent lamps of 16 candle-power.

One week from to-night the Buffalo's annual show will open. It has been decided by the committee in charge that the show will open at 10 o'clock in the morning and continue until 10:30 P.M. each night, instead of only afternoon and evening sessions as heretofore. On account of engagements, the show management will not get possession of Convention Hall until next Saturday at midnight, so that in order to open on time Monday morning there will have to be some tall hustling.

WORCESTER'S SHOW PREPARATIONS COMPLETE.

WORCESTER, MASS., Feb. 11.—Frederick N. Prescott, of Boston, chosen by the various automobile dealers of Worcester and the local militia companies to manage the automobile and powerboat show and military carnival to be held in the State Armory here the week of February 18, has completed all arrangements for the affair. The armory will be decorated in tropical fashion, and there will be 60 spaces for exhibits. All of these have been taken, the Worcester dealers receiving the first awards for space, and the Boston contingent taking the remaining space.



AEROCARS FILLED A PROMINENT SPACE AT CHICAGO.

SEEN AND HEARD AT CHICAGO.

One keen-eyed observer found out after considerable investigation that though all connecting rods looked alike, there was a difference. The rods themselves show no variety, there scarcely being a dissenting voice from the drop forging of I-beam section; it is the manner of fastening the big end that differs. In some this is of the usual hinge type and others of the marine type, the latter having numerous advantages, not the least of which is its greater ease and accuracy of adjustment to take up wear.

One of the most instructive sights uncovered by the interested and inquisitive visitor was that of a stump placed beneath the front axle of a car at the Adams Company's booth in the Armory. It graphically demonstrated what 16 inches clearance meant, as the stump was labeled with a sign to that effect, and to the very great majority of those who saw the latter it brought home to them for the first time the real meaning of clearance of any kind. It showed the kind of a road or lack of one that the Adams car could navigate without losing any of its under trimmings or disabling any part of its mechanism.

That Chicago is a man's show was never more strongly evidenced than by the attendance during the afternoon on any day of the show this year. Women there were, of course, but in nothing like the numbers to be found in the Garden at a corresponding hour of the day. During the afternoon at Chicago there was scarcely one of the gentler sex to 20 men, and what made this discrepancy very much more noticeable was the fact that a great many of the women were without male escorts. They came in couples and groups to see the show and these "hen parties" were greatly in evidence at a time when it would be thought there would be more of them. During the evening there was little to distinguish the Windy City attendance from that of New York on the score of representation of the sexes.

Talk at the show after Thursday, or in fact, immediately after the fact that the Deming trophy was missing from the Maxwell booth became public, was the query: "Who pinched Mercury?" As Mercury in just about the size of the missing statuette was in evidence all over the main floor by the score, this was thought to be a joke at first, but this did not prevent the private detectives at the building from holding up everyone with a package at the door until its contents could be examined. The statuette stands about 26 inches high and tips the scales at something like 25 pounds, so that it would not be exactly an easy thing to get away with. It was missed from its accustomed place on the show case flanking the main aisle shortly after noon Thursday. On Friday the press agent found Mercury.

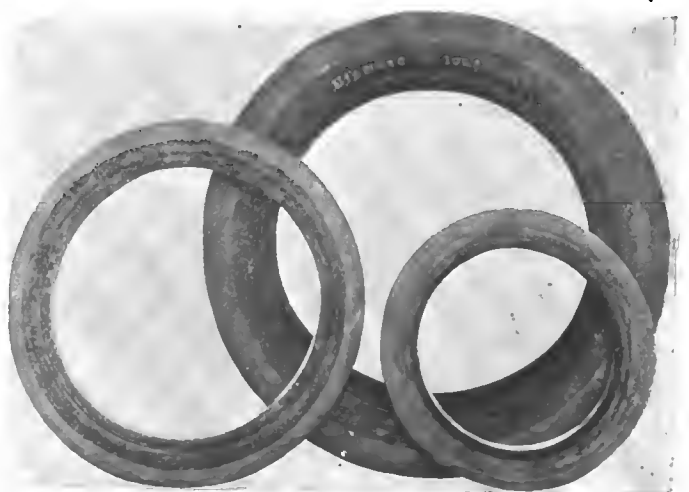
Someone with a head for figures and nothing much else to do, got busy on the show about the middle of the week, and when he got through he had calculated the aggregate and the



THE SIDE LIGHT SHOWED THE HARRISON TO ADVANTAGE.

average power of all the cars shown. There were something like 500 machines in all staged, and he figured that their average power would be approximately 30 horsepower, making the total for the entire show 15,000 horsepower. The term still continues to confuse quite a number of the visitors. After much hesitation a woman approached one of the attendants at an exhibit and asked for an explanation of the term "60 horsepower." "Thank you so much," she said after the matter had been elucidated at length. "We only have one auto in our town, and the horses are not used to it yet. I thought probably 60 horsepower meant it might frighten that many horses a day."

One of the largest pneumatic tires ever manufactured was the star attraction at the exhibit of the Diamond Rubber Company, and the size of this giant of pneumatics certainly made tires of standard dimensions look like the veriest pygmies. Like the shoes and shirts of Brobdignagian proportions occasionally displayed in store windows as "attention attracters," it looked far too big to be real, though it was, as it was a replica of one of a set made for a large limousine built by the Westinghouse Company, and which tipped the scales close to the 6,000 pound mark. The dimensions are metric, and are 1,000 by 165 millimeters, which represent the approximate equivalent of 40 by 6 1-2 inches. The largest American tires regularly made are 36 by 5 inches, so that special machinery was necessary to turn out these monsters. How this greatest of all pneumatic tires looks in comparison with some of the more frequently used sizes—those that are seen every day—is strikingly pictured by the accompanying photograph of it posed with two others, one of which is the smallest size regularly made, 22 by 3, the other being a 30 by 3 1-2 tire, largely used on light-weight touring cars.



BIG DIAMOND TIRE AND ITS SMALLER BROTHERS.

GASOLINE CHEAPEST WITH PRESENT MOTOR

AS a part of the series of experiments being conducted from time to time by H. A. Grant and J. D. Maxwell, of the Maxwell-Briscoe Motor Company, to determine the relative efficiency and commercial value of various forms of fuels, three Maxwell touring cars made the run from New York to Boston,



A HALT BETWEEN SPRINGFIELD AND WORCESTER.

each using a different fuel, on January 28-30, the details of the trip having already been given in *THE AUTOMOBILE*.

The three cars employed for the test were standard Maxwell touring cars of the model of 1907, fitted with a double-opposed horizontal motor, the cylinders of which measure 5 by 5 inches, while the initial compression is 58 pounds to the square inch. These motors are nominally rated as having an output of 16 to 20 horsepower when used with gasoline as a fuel. Each car carried the same number of passengers and equipment, the weights being as follows: Car using gasoline fuel, 2,270 pounds; kerosene, 2,520 pounds, and alcohol, 2,750 pounds. The carbureters were all of the standard type regularly employed on the Maxwell cars, and no special devices were added in the case of those using fuels other than gasoline. No adjustments of any kind were found necessary at any time during the trip, the actual running time of which was 16 hours 20 minutes, and the distance covered 249 miles, giving an average speed of 15.41 miles per hour.

Owing to the heavy going, which was made considerably worse on that part of the route from New Haven to Boston by reason of the snow, which was almost a foot deep for almost 150 miles of the run, the gasoline consumption was unusually great and that of kerosene and alcohol correspondingly so, though it is

probable that the proportion would not differ greatly, the test having been one of sufficient length to permit of forming an excellent idea of the comparative values of the fuels when used in the type of engine now current. The average mileage per gallon of gasoline was 10.1—a good showing in view of the road conditions; of kerosene, 7.4, and of alcohol 6.13 miles.

Every ounce of fuel that was used on each of the cars throughout the entire run was carefully noted by the observers, and these figures, taken in connection with those of the weight of the cars and distance covered, give some very interesting data regarding the cost per car mile and per ton mile for each fuel, these being shown by the appended table, which also gives the total amount of each class used and its cost:

Car.	Weight.	Cost per Gallon.	Total Consumption.	Cost of Fuel.	Cost per Car Mile.	Cost per Ton Mile.
Gasoline	2,270	\$0.20	24.75	\$4.95	\$0.019	\$0.0169
Kerosene	2,520	0.13	33.75	4.39	0.017	0.0139
Alcohol	2,750	0.37	40.75	15.07	0.06	0.0448

Almost twice the quantity of alcohol was required to travel the same distance as with gasoline and almost 50 per cent. more when kerosene was the fuel employed.

Taking the cost of the different fuels into account, the showing is even less favorable where alcohol is concerned, but it must be borne in mind that the engine was not particularly designed to



REPLENISHING THE FUEL TANKS OF THE ALCOHOL CAR.

use this fuel. Thus the cost figures out fully 2 1-2 times greater than that of gasoline and over three times more than that of kerosene, though there is not such a wide difference between the quantity of the latter required as compared with gasoline. Taking these figures as a basis, it is evident that alcohol would have to sell at 22 cents per gallon in order to compete with gasoline at 20 cents, even though used in a specially designed motor.

Many interesting observations were made as to the characteristics of alcohol when used in a gasoline motor, such as the fact that the motor apparently developed a great deal more power on hills than those using kerosene or gasoline by reason of the higher mean effective pressure, particularly owing to the short stroke of the motors employed. With the equipment fitted to the cars it was impossible to cause the motor to knock or pound by reason of advanced ignition, nor could the motor be stalled on a hill.

The chief object of the test was to demonstrate the availability of these fuels for use in the modern automobile motor without the necessity of any special devices or change of equipment, or, in other words, the fact that carbureters as at present designed are capable of handling fuels of varying densities without any radical alteration. It goes without saying that in a specially designed motor, having much higher compression and a longer stroke, alcohol would make a far better showing.



GETTING UNDER WAY FOR THE DAY'S WORK.

AMERICAN DETACHABLE TIRES AND REMOVABLE RIMS

By C. B. HAYWARD.

THAT the standard type of clincher tire on the standard type of rim has been able to hold its own despite the great amount of attention paid to mechanical forms of fastening and the number of devices of this nature that have made their appearance on the market within the past few years, may be taken

finally developed with a stiff retaining bead, is but one of the numerous instances in which practice utterly flouts theory, for it did not appear possible that the force of inflation alone could ever suffice to prevent the tire being torn from the rim of a heavy car at high speeds, and this is what led makers to undertake the development of a mechanical type of fastening at an early day. Tire lugs were recognized as necessary to give that factor of safety required to avoid creeping with its attendant evil of stripped valves, but it was also realized that at best they were but a makeshift—without them



SECTION VIEW OF FISK RIM.

the clincher was not safe and with them it did not represent a convenient or readily detached form of fastening, which is doubtless accountable for the fact that the lug nor anything akin to it has been perpetuated in any of the forms of mechanical fastening

that have been developed in the interim. The problem is complicated at the outset by reason of the varying requirements to be complied with, in that the fastening must grip the tire like grim death, and yet permit it to leave the rim without the necessity of going through an operation similar to that of breaking into a safe deposit vault. It has been approached in a variety of ways, but with all their seeming differences it will be found



GENERAL VIEW OF FISK RIM.

upon investigation that experimenters have met, with few exceptions, upon a common ground where basic principles are concerned, which probably explains the general measure of success that has attended their efforts as represented by the devices now on the market. Daily experience alone will develop the type most perfect in its details.

Progress Revealed.

As in many other things, while there were tire users galore who consigned the clincher tire and all its drawbacks to perdition every time they had occasion to remove or replace one on their cars, making vows in the meantime that they would be the first to adopt a better fastening if some genius would only condescend to evolve it, the manufacturer who did so encountered the inevitable and almost immovable inertia



PENNSYLVANIA DISMOUNTABLE RIM.



AJAX TOURING RIM.



AJAX RACING RIM.

to mean that none of the inventions in question have proved to be the success anticipated for them by their sponsors, or that, being a success, they have not yet reached a stage where their merits have been brought home to a sufficient number of tire users to make their adoption general. The autoist who has not given the subject more than passing attention is apt to incline to the former view, while between this hasty assumption of failure, arising chiefly from the conservatism of the tire user at large, and the opinion of the mechanically fastened enthusiast which admits of the existence of no other form, there is the large army of every-day tire users who have no preconceived opinions one way or the other. It is in the ranks of the latter that the maker seeks for converts, and any man who has ever struggled with a refractory clincher in the large sizes now in vogue is more than willing "to be shown."

Experiments Date Back to Early Days.

To those who have followed the evolution of the pneumatic tire, as applied to the featherweight bicycle, through the various



CLIP WHICH HOLDS ENDS OF AJAX RIM TOGETHER.

stages it has been compelled to pass in order to make it capable of supporting many times its former total load and at speeds hitherto undreamed of, it is unnecessary to recall the fact that the mechanically fastened tire is not something of recent origin; comparatively speaking, of course, as the automobile tire of any sort is but of infantile age. The success of the clincher tire as

that waits "to see the other fellow buy it" before investing, when it came to the matter of marketing their devices. Anyone who had given the subject a thought, whether mechanically inclined or not, could hardly have failed to realize that some positive method of fastening was bound to come sooner or later, just as surely as the automobile is certain to displace other forms of transportation in time. But neither his knowledge of that fact nor his desire to see it materialized were sufficient to cause him



SECTIONAL VIEW MARSH RIM.

to become an advocate to the extent of setting an example to his fellow-autoists by adopting any of the devices on the market for his own car. This is the situation that has confronted the manufacturers all along; there was so much dead weight to be moved that the progress toward popular favor was necessarily tedious, with the result of

one year's work not greatly in advance of what had preceded it. Then came the advent of the simon-pure removable rim for racing purposes, and with a start the automobile-using public woke up gasping to the fact that the simple device which had accomplished such marvelous results in the way of time saving, was nothing very different from that they had had before them at home for some time previous.

Widespread interest in mechanical forms of fastening really dates from that occasion, such is the curious turn that things insignificant in themselves will sometimes give the trend of general opinion. With one or two exceptions the entire American tire industry was to be found grouped about the gallery of the Coliseum so that a better opportunity to see and compare the combined results of efforts along this line could hardly have been desired.

Dismountable Rims Not Numerous.

Where what is known as the true dismountable type of rim is concerned, this is not much in evidence, the makers of the

Ajax and Fisk and of the Pennsylvania tires being the only ones to show devices of this kind. The remainder are in the class of detachable or mechanically fastened tires and the progress the latter have made is well evidenced by the fact that there is not a maker of tires to-day whose showing does not include something of this kind, whether of original invention or made under license from the patentees. The Ajax removable rim is only made in what is termed



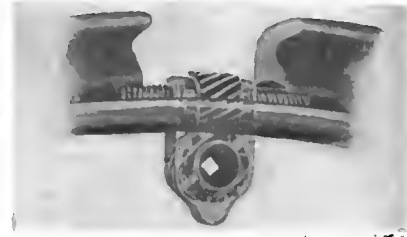
GOODRICH TIRE AND RIM.

a racing type, designed for that extremely exacting service.

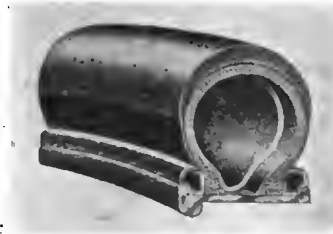
This differs considerably from what is termed the Ajax "tourist rim," which is really a detachable tire. The wooden felly of the road wheel carries a fixed steel rim, permanently bolted to it. To retain the removable rim, the inner edge of this fixed rim is raised and three grooves are cut across its surface. The tire is mounted on a separate steel rim, inflated and held in position in the usual clincher manner. The inner face of this steel rim carries three metal projections or wedges, corresponding to the grooves on the fixed rim. Special safety bolts, counter-sunk, are employed, and, as the tire never needs to be inflated on the wheel, a similar type of valve can be used. The tire mounted and inflated in advance on the detachable rim, the whole is slipped on the wheel, the projecting wedges coinciding with the grooves, a catch is released, the expanding band springs open and the tire is ready for running. Creeping is prevented by the grooves and wedges, and any possibility of flying off sideways is prevented by the expanded band. The entire circumference of the wheel being a bearing surface, there is not the danger of stretching common to some types of rim. An Ajax racing rim has been removed and replaced by a new one in 14 3-5 seconds.

The tourist rim consists of a main rim or base member permanently fitted to the wheel, carrying on one side an ordinary clincher or bead. The opposite or outer edge of the base member is provided with a slot or groove around its entire periphery from three-eighths to five-eighths inch deep, according to the size of wheel. In this groove is placed a split metal locking ring which is contracted and expanded by means of projecting tips. On the same edge is a flat steel band turned up on the fixed rim one-eighth of an inch. This turned edge acts as a check against which the removable bead or clincher fits. The outer removable clincher is also fitted with a groove on its inner face, which the locking ring in its expanded position entirely fills, holding the rim rigidly on the wheel. To take out an inner tube is an exceedingly simple matter. A small metal wedge between the two ends of the expanded band is withdrawn and the two tips brought together and held in a contracted position by the clip shown in engraving. There being now nothing to hold it, the outer clincher drops off, and the shoe and inner tube can be slid off the fixed rim. The operation is so simple and requires so little muscular effort that a child could perform it. No nuts, bolts, or other tightening mechanism are employed, nor is any special tool necessary for operation. Lugs or bolts may be used and the ordinary type of valve is employed.

In the case of the Fisk, a simple but highly effective principle that has hitherto not been taken advantage of in this connection has been employed. The inflated tire is held on the dismountable rim with the familiar Fisk type of mechanical fastening, which is one of the oldest of its kind on the market. The center



MIDGLEY TURNBUCKLE.



CROSS SECTION OF THE DUNLOP.



UNIVERSAL RING OF THE MIDGLEY.

of the wheel is held in position by the universal ring of the Midgley. This ring is contracted and expanded by means of projecting tips. On the same edge is a flat steel band turned up on the fixed rim one-eighth of an inch. This turned edge acts as a check against which the removable bead or clincher fits. The outer removable clincher is also fitted with a groove on its inner face, which the locking ring in its expanded position entirely fills, holding the rim rigidly on the wheel.

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of this dismantable rim has a raised section with sloping sides, one of which engages a corresponding raised edge on the permanent metal rim bolted to the felly. When the rim with its tire is put in place this holds it at the inner side. The felly of the wheel and a split ring with a beveled face at an angle of about 45 degrees corresponding to a similar face on the permanent rim, are pierced at regular intervals with six bolts, fastened so as not to turn or shake loose. When the nuts on the latter are tightened, the ring expands, the two faces sliding on one another, causing it to rise vertically, thus firmly gripping the rim between two substantial metal rings. As it is only necessary to give the nuts a few turns to loosen them, and they never have to be removed, the operation is one requiring but a very short time to complete. In addition to marketing this new type of rim the regulation Fisk detachable type will be continued.



GOODYEAR DETACHABLE TIRE.

The Pennsylvania is the only other true dismantable rim produced in this country, and presents the extreme of simplicity. It is based on a radically different principle than either of the other two just described. The permanent rim attached to the felly of the wheel is made with special recesses or wide slots corresponding to detents or raised portions on the removable rim. The countersunk portions of the permanent rim are tapered in a direction contrary to that in which the wheel runs, so that the strain created by the latter when under way only tends to force the rim and tire on more tightly. In order to prevent lateral play, which might cause the rim to fly off the wheel sidewise, the sides of the detents are engaged by the sides of the recesses, and a further precaution is added in the shape of two substantial set-screws, which constitute the only part of the device requiring the use of a tool of any kind. The rim carrying the already inflated tire is slid on, given a turn backward for an inch or so, to cause the detents to engage, and the two set-screws tightened, completing the operation, the latter being reversed to remove it, and both being possible of accomplishment by an unskilled driver in less than two minutes, including the preliminary work in the shape of raising the car on the jack.

Large Showing of Detachable Tires.

It is to the field of mechanically fastened tires that the American maker has given up a very large portion of his time, and the result is evident in the number of this type of devices now to be found on the market. Every one of these inventions has been the result of extended investigation and experimenting on the part of those responsible for them, and as practically all of them appeared within a very short time of one another, it would be difficult to treat them chronologically. With the exception of the Fisk, which, as already mentioned, uses transverse bolts and was one of the

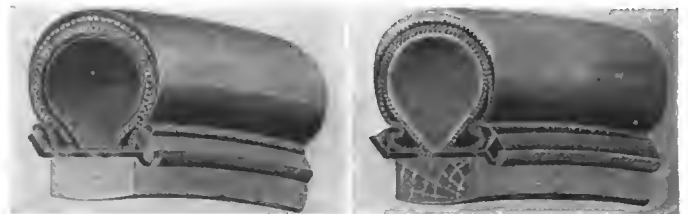


SECTION OF GOODYEAR SHOWING VALVE FASTENING.

first to make its appearance, there is considerable unanimity of opinion with regard to the basic principle of nearly all these devices, this consisting of the use of one or more loose rings. It is in the method of attaching the latter and making it fast that the greatest difference is to be found.

In the Marsh rim, for example, which is put on the market by the Diamond tire interests, this takes the form of a small key-piece. As shown by the section illustrating it, the rim is provided with a threaded extension passing through a hole in the key-piece when the latter is placed in the opening between the ends of the split ring. A nut is tightened on this threaded end and provides against any possibility of the ring jumping out of its channel or being thrown off sidewise, though experience with this rim has shown that it can be run with perfect safety, even though this extra precaution be not taken. As has come to be the case with every maker of detachable tires during the past year or two, the necessity of making the rim so that it could be used with every form of standard tire was apparent at the outset, so that the Marsh rim was given this characteristic at the start. With interchangeable flange rings, the Marsh rim adapts itself to the Dunlop type of tires, or by the use of stay-bolts it makes Diamond regulation clincher tires an entirely convenient and safe equipment.

In the Goodrich quick detachable tire, the construction of the latter is exactly the same as the standard clincher tires made by this firm, and as the dimensions of the rim are standard, the



FIRESTONE, CABLE TYPE.

FIRESTONE, CLINCHER TYPE.

latter will readily accommodate itself to any make of clincher tire manufactured under the G & J patents. The removable ring in this case is provided at its ends with two substantial hooks of almost square section, and a specially shaped slot in the permanent rim on the wheel itself. This is somewhat on the form of an exaggerated letter Z with a long and a short horizontal bar and without any independent connecting line between the two, its outline being well illustrated by the accompanying illustration of the rim and complete wheel. The two hooks of the removable ring are dropped through the long opening of the slot, which is innermost, and then forced, one after the other outward and into the shorter one, which they completely fill. A handy tool is provided for this purpose. The construction is such that when in place the inflation of the tire contributes very largely to its holding power. A dowel pin insures the placing of the ring in the proper place, while the dust cap provided for the valve also acts as a retainer, with the result that the tire does not creep and cannot blow off the rim whether inflated or otherwise.

The familiar principle of the turnbuckle has been taken advantage of in the case of the Midgely rims used in connection with the Hartford and Dunlop tires, as well as of those of other makers manufacturing it under license from the patentees, as is the case with Morgan & Wright. The greatest drawback of the turnbuckle in the form in which it is best known is the length of time required to adjust it. This has been overcome by the addition of a device which is at once a multiplying gear and lock. It is constructed on the familiar principle of the worm and spiral, and with the aid of a small crank, which is the only tool necessary, the turnbuckle may be drawn up or loosened in a fraction of the time necessary with the ordinary type. The crank is provided with a square shank fitting a similar hole in the center of the worm, and as the latter and the gear with which it meshes are so cut as to form an irreversible unit, no amount of strain on the

split ring causes this gear to turn the worm when running. This precludes the necessity of any other form of locking devices, as the ring is bound at whatever point the turnbuckle is tightened to. The beads of the tire itself are held between a floating ring on which the tube rests, and the retaining rings.

The Goodyear universal rim is the oldest rim of its kind on the market—that is, one having removable endless flanges. As its name indicates, it is designed to take either the Goodyear detachable tire or any standard type of the G & J clincher. It consists of a rolled steel base



CROSS SECTION REPUBLIC TIRE.

permanently attached to the wheel, two flanges or hoops adapted to slide on and off the base easily and a split locking ring. The last named drops into the usual channel in the base and prevents the flanges from being pushed off when the tire is inflated. A spreader plate carrying a thumb nut goes over the valve and, when drawn down, presses the flange against the split portion of the locking ring, so that it cannot be lifted out or removed from the channel by any strain regardless of the direction from which it is exerted nor its severity. No special tools of any kind are required and the operation of removing or replacing a tire is very speedily accomplished.

In the case of the Firestone, the rim is fitted either with flanges for a cable bead tire casing or flanges for the regulation clincher type. In the former case the rim will take the Firestone mechanically fastened tire and in the latter any standard form of clincher. Both the casings and rims are interchangeable with other standard quick detachable rims and casings. The flange

and tire are held in place by a simple and ingenious safety locking ring slipping into a channel, creeping being prevented by a spreader attached to the valve stem, a wrench being the only tool necessary to remove or replace the tire. The removal of the locking ring permits the flange and tire to be slipped off the rim. The illustrations show the difference between the cable and clincher bead types.



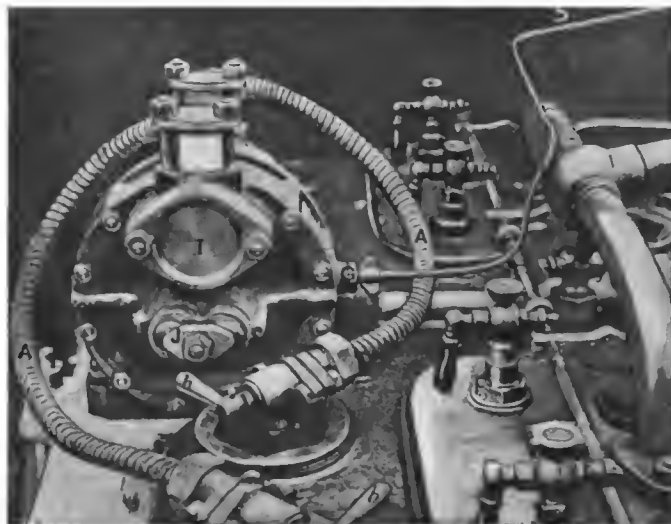
REPUBLIC WHEEL AND RING.

Particular attention has been paid to the matter of excluding dirt and water as well as confining the air to the interior of the tire proper in the evolution of the quick detachable type put on the market by the makers of the Republic tires. So far as the tire itself is concerned, this is somewhat on the lines of a combination of the cable and clincher types, a special feature being found in the addition of a soft rubber strip along both inner edges of the beads, thus effectively protecting the inner tube, the perfect joining of the base preventing pinching of the tube—a most prolific source of so-called punctures. A locking ring secured in place by a retaining nut at the base of the valve constitutes the form of fastening employed, in addition to a keypiece placed opposite the valve and completing the flange ring, which forces the locking ring snugly down into the channel and onto the wheel.

Where other prominent firms are concerned, those who have not brought out special devices of their own, manufacture some of those already on the market under license from the patentees. For instance, the makers of the G & J tires and Morgan & Wright also make the Dunlop and clincher tires for use on the Midgely universal rims, so that every prominent maker of pneumatic tires in the country is making a device of this kind, whether of his own invention or not.

MECHANICAL TIRE INFLATOR PERFECTED.

For three years the experts of the Michelin tire factory at Clermont-Ferrand have been studying the problem of mechanical tire inflation. The result of their labors has just been given to the public in the shape of a machine of very ingenious construction, which, with the engine as motive power, will inflate the largest tire in five minutes. At present the apparatus can only be used for four-cylinder engines, but there is no reason why it



MICHELIN MECHANICAL PNEUMATIC TIRE INFLATOR.

should not be modified for use on a two-cylinder, or even a single-cylinder engine. The Michelin apparatus consists of a compact little pump no larger than the two fists, which may be mounted in any convenient position and connected up to two of the cylinders by a couple of flexible pipes. Valves and taps are placed on these cylinders so as to cut off the supply of gas and allow only pure air to enter, while the other two cylinders are set working. Thus two cylinders are working under normal conditions, and two are compressing air and sending it to the pump. But the pressure of air from the cylinders is not sufficient to inflate a modern tire, and for this reason the pump has to be employed to increase the pressure. The manner of doing this is simple but clever. The air supply to the pump is divided into two parts; one acts on the large end of a piston in the pump, and the small end of this piston compresses the second supply of air to the required degree. The relative areas of the two ends of the piston being as 5 to 1, the air entering the pump at 2 kilograms pressure leaves it at 10 kilograms, this being a sufficient pressure to insure rapid and satisfactory inflation of the tire. From the air outlet shown on the right-hand side of pump a pipe leads up to a terminal on the dashboard, and from this point a connection is made to the tire valve by a rubber piping in the ordinary manner. The apparatus is extremely robust; when once fitted it needs no attention or lubrication, and does not necessitate the use of chain, gears, or belt.

A new bearing metal, composed to a large extent of cadmium and antimony, is being developed in England. The cost of the new alloy, however, is said to be practically prohibitive for general purposes, owing to price of cadmium, its principal component, ranging in the neighborhood of one dollar per pound.

THE HORSE AND THE AUTOMOBILE

By VICTOR LOUGHEED.

ONE of the least understood of the industrial and sociological phases of the automobile development is the relationship borne by the new conveyance to the field of the horse. So far—to the satisfaction of the opponents and the confusion of the advocates of the motor vehicle—it is the evidence of a casual view of the situation that the quantities of automobiles placed upon the market have made no very perceptible inroads upon the mode of transportation they are destined to supplant.

Horses to-day, in most localities of the United States, sell as numerous and for as high prices as ever, while in some localities they bring even more; in every community in the country, for each automobile enthusiast found spreading the propaganda of the new conveyance there are to be found a thousand hard-headed, sensible people, perfectly willing to be "shown," but who nevertheless are skeptical in regard to both the present importance and the future prospects of the automobile; and there are several manufacturers of horse vehicles whose factories boast an *annual* output numerically equaling the total output of automobiles during the history of the industry in this country!

All of these statements are statements of fact, and as facts are to be reckoned with if the automobile is to achieve the goal for which it is clearly headed—the practical extinction of the horse. Consequently, a statistical study of the situation is the only possible means of reaching a really well-founded opinion as to what are to be the lines along which the industry is most likely to expand. Something of this sort was presented by the writer, in an article captioned, "The Field for the Automobile," which appeared recently in *THE AUTOMOBILE*—in the issue of November 1, 1906. The figures therein given were taken directly from the Reports of the Eleventh Census—the census figures fortunately being very clear and complete on this interesting subject.

Two-thirds of Horse-drawn Vehicles Made for Pleasure.

By these census reports, it was shown that the annual production of horse vehicles of all kinds in the United States during 1890 was 1,369,254, and in 1900, 1,603,371. Since these decennial reports, supplementary reports have been issued, indicating an annual output now of something slightly over 1,700,000. Incidentally, there is disclosed the decidedly significant fact that fully two-thirds of all the horse vehicles made are distinctively pleasure vehicles, while three-quarters of these—one-half of the total—are specifically *two-passenger* pleasure vehicles. Also, the heavy commercial vehicle, which is accredited by nine men out of ten in the automobile industry with some almost inexpressibly great future, certainly can invoke no horse-vehicle parallel to indicate a grain of reason in this awestruck regard for its future.

Of "*drays and trucks*," the 1900 census reports state, there were then made 7,417 annually—a little more than one one-thousandth of the complete output. Of "*furniture vans and caravans*," there were 1,725; of "*coal wagons and carts*," 3,155; of "*dump wagons and carts*," 4,098; of "*ice wagons*," 1,144; of "*log and ore wagons*," 4,282; of "*public conveyances*," 2,316; of "*trade wagons*," 11,788; of "*street sweepers, sprinklers, etc.*," 491; and of "*government and municipal wagons*," 1,108; besides perhaps another thousand in miscellaneous classes. The total of these is 31,107—.019 per cent. of the total. "*Farm wagons and carts*," to the number of 405,513, and "*business wagons*," to the extent of 125,726—the two totalling nearly one-third of the total output—at first sight make a more respectable showing, until analysis of their subclasses discover that nine-tenths of these are the lighter vehicles, not likely to be competed with from automobile standpoints except by the use of special bodies on accepted pleasure types of chassis.

Of course, nothing in the foregoing denies a very great field for the commercial automobile, but this is true, not because of its comparative importance, but because a demand for even 50,000 or 60,000 commercial vehicles a year is an ample basis upon which to found a great and important industry

But, in the writer's opinion at any rate—and all the evidence to be had bolsters up this opinion—the tremendous field for the road vehicle of the future is the truly tremendous field filled by the road vehicle of the present.

And the average road vehicle of the present is not a multi-millionaire's "locomotive of the highroad," nor even a \$500 run-about or a \$1,000 touring car; it is a \$95 two-passenger buggy, drawn by a horse worth perhaps \$100, and equipped with accessories, harness, etc., probably totalling not over \$55 more. Consequently, the complete road unit most in demand to-day is that for which the purchaser is willing and able to pay, and is in the habit of paying, about \$250.

Facts That Are Interesting and Very Significant.

With an annual production of 1,700,000 horse vehicles, of which fully 1,000,000 are pleasure vehicles, is it not reasonable to presume that at least as many as 40,000 of these—only 4 per cent.—are of the high-grade, expensive, luxurious types, naturally associated with silver-mounted harness, footmen and coachmen, flunkies, and other of the money-absorbing appurtenances of wealth? And is it not equally safe to assume that these vehicles, fully equipped for the road—with horses and with harness—will cost on an average fully \$1,500?

Yet, it is an absolute fact that the automobile industry in this country, rapidly as it has developed, has only now reached an annual production of about 40,000 vehicles of all classes, retailing for an average of about \$1,500 each—in condition to run upon the road.

What more natural, then, that in these days of its sturdy infancy, the automobile should compete first with that phase of horse use wherewith competition is the easiest, requirements the simplest, money the freest, prices the highest, and profits the greatest? What more natural than that the hazards of catering to a low-price quantity demand, involving the risks of heavy investments for quantity production and the assurance of small profits, should be temporarily neglected in the rush to till the field of greater immediate promise?

Viewed in this way, the situation is perfectly logical and readily understandable. It obviously is a necessary condition in the economic evolution of an engineering industry. Through catering to the demand that has possessed the "price," and therefore could afford to experiment, the experimental period has been passed with a painlessness and general satisfaction that could not have developed in any other circumstances.

To-day, as the result, any concern with average good designers and large manufacturing and selling resources, could conservatively embark on the construction of 100,000, or even 500,000 low-priced automobiles, all alike, with every assurance that all would sell quickly and give the buyers their full money's worth of service for years to come.

The efficiencies of quantity production, applied in connection with the best that is known of simple and reliable designs, would insure a consistent quality and a price, which alone would constitute most of the selling argument necessary, thus saving much of the tax on the marketing.

The Horse Is Distinctively Losing Ground.

In the meantime, the horse reigns only in the fields in which his supremacy has not been disputed. This may be startling, but it certainly is true. Let any one consider for a moment, and it must be admitted that in those of his activities that involve catering to luxury and the long purse he is distinctly losing ground. He has lost ground. He is no longer used by the ultra-fashionable and the pleasure-loving to the extent that he once was. The riding and driving clubs all over the country are losing membership, and even closing their clubhouse doors, and livery stables are losing money or being transformed into garages.

The remaining stronghold of the horse is guarded solely by low prices.

The horse-vehicle production for 1906 was only 1,700,000, which indicates that the 1,877,517 required by 1910, if the past rate of growth is to be maintained, is going to fall about 140,000 short. Significant fact!

This is almost exactly the number of automobiles likely to be in use at that time, if present-day figures extend as the logic of the statistician argues they will.

In other words, for every automobile placed in commission in one place, a horse vehicle has gone out of commission there or in some other place. And the law continues to apply, inexorably. The horse has made and is making no stand whatever against the rising tide of mechanical propulsion. He persists in use, not because of his merits nor because of the difficulty of winning the victory over him, but because it takes time to organize to assail him. It is altogether a matter of time, not of difficulty. His strength is a sheer numerical strength.

The horse simply has not been assailed in his most numerous field of usefulness by the automobile, and his most numerous field of usefulness is a matter of something like a million a year of two-passenger, \$250 conveyances!

The average horse user, in other words, is of the people. In

proportion as he is numerous, he is individually weak financially. The automobile user, on the other hand, though less numerous, has been of a higher financial strata. Wisely, manufacturers have catered to him. But now the industry has developed and the situation is changing. Perhaps the price of \$250 need not even include a full running equipment. The cost of tires, for instance, might be left out of consideration altogether, with the advantage of eliminating the present unsatisfactory practice of placing cheap tires, of too-small sizes, on cheap cars. Tires being a considerable running expense, there is no more real reason for including them in the list price of an exceedingly low-priced car than there could be for selling the same car with the gasoline and oil tanks filled, or a horse with enough shoes and hay to enable him to travel 10,000 miles—the approximate life of a tire.

It is to the credit of, rather than a reflection upon the present status of the automobile industry that the day of the low-priced car is dawning. When the masses, as well as the classes, can possess automobiles, the number of sales will more than compensate for any possible reduction in the profits upon sales. And, as has been said before, will not the low-priced car, by its widespread use alone, do more in months for the good-roads and fair-legislation propogandas than has been done in years by all the other interests enlisted behind them?

ADVANCE OF THE MOTOR 'BUS IN THE GREAT CITIES

AS copy providers for the British daily press the London automobile 'buses are unique. Columns upon columns have been written on their side slipping proclivities, their noise, their smoky exhausts, dangers of fire, damage to property through vibration, etc. Despite all the criticism, the 'buses have continued to grow in numbers at the expense of the horse-drawn vehicle. If proof were needed of their success it is to be had in the reports of the London transportation companies. Even the Electric Underground Railway Company, with the best equipped plant in the metropolis, quick trains and low fares, has to announce a large diminution in its takings as the result of the competition of auto 'buses. The majority of the London 'buses are gasoline driven. A small number are British-built steamers, and the latest addition

is the electric 'bus shown in our illustration. A uniform type of body has been adopted, as shown in the engraving, with transverse seats on the top. More than half the gasoline 'buses are of foreign origin, De Dion-Bouton, of Paris, having supplied a large number, other big furnishers being Mors and Lacoste & Batmann. Germany has succeeded in capturing a large amount of the London 'bus trade. One of the De Dion 'buses, similar in every respect to the London article, is daily running on Fifth avenue, New York, as an experiment. All Paris 'buses, about fifty in number, are of the Eugène Brillée type, driven by 40-horsepower gasoline motors. The Serpollet-Darracq combination is seeking to take over the entire Paris 'bus service when the present company's lease expires, and provide a complete service of steam vehicles.



ONE OF THE FEW ELECTRIC 'BUSES NOW BEING OPERATED IN THE FASHIONABLE WEST END OF LONDON.

LETTERS INTERESTING AND INSTRUCTIVE

A Novel Automobile Wheel.

Editor THE AUTOMOBILE:

[570.]—I would like to ask a question in regard to the wheels in present use on all automobiles, that is, whether the standard artillery wheel is giving perfect satisfaction at present, or whether it could be improved on or not. My reason for asking is that I have a model wheel, which I am having patented, and which I think is an improvement over other wheels, as it is a device whereby we get a complete staggered-spoke wheel and employ no bolts whatever, while we can use from ten to thirty spokes in each wheel if desired. This, I think, would make a much more substantial wheel than the regular artillery. And another feature is that it will not require much machine work in its construction—only to cut a thread on both sides of the hub, also inside of a retaining ring that screws to the hub to hold the spokes in place. When it is complete, it makes a decidedly rigid and stout wheel. In case of an accident, one can remove all spokes from one side and replace them in a very short time without interfering with the form and shape of the wheel, and without taking it all apart. Now I would like to have your opinion of such a wheel, and whether you think there would be a market for same, before I go ahead with it. If you can enlighten me on the subject I would be obliged.

WM. VAN ETTEEN.

Richmond, Va.

Without seeing the actual wheel itself, it is difficult to say with certainty whether or not you have something capable of being marketed at a profit. Even then, so much depends upon the strength of the backing you have, and upon the business ability that may be at your command, that we could not hope to furnish an offhand opinion likely to be worth anything to you. There is no doubt but what many now popular automobile wheels might be readily supplanted by something altogether superior, and it is a fact that a lot of people believe the staggered-spoke wheel is better than the artillery wheel. It is usually more complicated, however, and harder to repair, though it has been more used on horse vehicles than the artillery wheel. Personally, we do not particularly fancy the great number of spokes you suggest, though this is only a detail, undoubtedly capable of modification. In the small sizes commonly used for automobile wheels, the unsupported portions of the spoke will hardly average more than seven inches—certainly short enough to stand up regardless of the construction employed. We would suggest your reading up on wheel patents before going ahead, since there has been an immense number of devices brought out along the line you mention, and there might be something that would conflict.

A Hasty Conclusion.

Editor THE AUTOMOBILE:

[571.]—In your issue of January 24, on the pages devoted to correspondents' letters, you take Mr. Clarence Jones, Columbia, S. C., to task for his statements in regard to current consumption in (letters 543). You state that he neglects to consider that an engine running at 1,500 revolutions to the minute makes contact twice as often as one running at 750. This is certainly true, but it is also just as certainly true that each contact is exactly half as long, therefore the total time of contact is the same in either case. In one case, at 750 revolutions, we have a certain number of contacts of a certain duration every second, and at 1,500 we have twice the number of contacts of just half the duration, so there would be the same battery consumption in either case. It seems to me these considerations would convince any one that battery consumption is absolutely independent of motor speed, except that it might be influenced by the lag of coils and timer.

THOMAS C. FORBES.

Los Angeles, Cal.

We think that you rather miss the point of our contention in assuming that battery consumption is determined solely or chiefly by the duration of contact. You are correct, of course, in what you point out—that at double the speed of rotation the duration of contact is halved—but it seems to be generally believed that there is a surge of the current upon the contact being made which has much more to do with battery consumption than the mere duration, which is very short, even at the longest.

An Unusual Type of Accident.

Editor THE AUTOMOBILE:

[572.]—I have just read an account of an automobile accident in which a man was killed by the explosion of a flywheel, due to its being run at too high a speed. Will you please tell me exactly what can cause such an accident, whether it is one that can occur to any automobile if the engine is run too fast, or whether it is due to some defect in the wheel, such as probably would not exist in some other wheel on the same make of car. Also, is it the centrifugal force or some other effect that causes the breakage? I understand that the flywheel of any large stationary engine is almost certain to break if the engine is speeded way above its normal speed. Is this true of automobile engines also, and, if not, why not?

GEORGE ISAACS.

Durham, N. C.

The laws of mechanics are the same in the bottom of the sea or on the top of a mountain, and what is true of the flywheel of a stationary engine may also be true of the flywheel of an automobile. The flywheel of any machine must be designed to run at a certain maximum speed—either the maximum at which it is possible for the machine to run or a maximum determined by some safety-controlling device. This maximum involves a certain peripheral velocity, which, with a given weight involved, results in a given centrifugal force. Strength sufficient to resist this force must be provided in the design, and if it is not provided—because of faulty design, flaws or imperfections in the material, or a wrong conception of the maximum speed—the flywheel is highly dangerous, being likely to break with the result that fragments will fly around like projectiles. Another factor that sometimes has a part in flywheel breakage is gyroscopic action, coming into play when the bearings are loose or the center of gravity is not at the center of rotation. Of course, this effect is more likely to break crankshafts than flywheels, unless the latter are unduly weak in the spokes or web.

Causes for the Heating of Tires.

Editor THE AUTOMOBILE:

[573.]—Can you tell me whether the heating of automobile tires and consequent separation of the plies of the outer shoe and destruction of the inner tube is caused by the frictional contact of the tire with ground, or the internal friction of the air confined in the tube; or do both contribute as causes of the heating and in what proportion?

It is claimed that the larger portion of the heat is generated by the velocity with which the air is forced round the inner tube, the air being circulated in the inner tube in a direction opposite to that in which the wheel is revolving, by the contact of the tread of the tire with the ground. The weight of the car flattens the tire from a round to an oblong or elliptical form and continually forces or pumps the air in the tube in the direction opposite to that of the wheel's travel, the continual flattening of the tire when in motion also causing a "pounding" of the air in the inner tube at a point where the shape changes or flattens when in contact with the ground, superheating and expanding the air.

As an illustration, a 34-inch tire on a car running at the rate of 40 miles an hour would make approximately 380 revolutions per minute. The circumference of the tire being 106.76 inches would make the tire rim travel 3,380.75 feet per minute and the air in the tube circulating in the opposite direction would have a frictional travel of 6,761.50 feet per minute approximately, or about 1¼ miles per minute, and the propulsion of the air through the inner tube at this tremendous speed would heat and expand it to such a degree that the tube would burst. I claim that 75 per cent. of what are called punctures are really ruptures of the tire caused by the expansion of the air in the inner tube. I would be very glad to hear from anyone who has given any thought or study to this phase of the heating of the inner tube of automobile tires.

Buffalo, N. Y.

JAMES F. PRESTON.

While we have been unable to find any definite data on the subject, we think it is evident that the disintegration of a pneumatic tire is due both to the friction of the shoe against the road as well as the friction of the tube and inside of the shoe, and that by far the greater part of it arises from the constant bending of the outer shoe at its sides. In fact, the latter would

appear to be almost wholly responsible for the separation of the various plies of the shoe which will usually be found to start at the point which is subjected to the greatest amount of bending. The rapidity with which a tire disintegrates depends upon the care given it more than anything else, all other things being equal. The destructiveness of this bending is the chief reason for the stress laid upon proper inflation by the tire maker.

Assuming your figures to be correct in the instance cited, the conclusion that it is impossible to run a car with pneumatic tires at a greater speed than 40 miles per hour would appear to be inevitable. As you are probably aware, speeds in excess of 100 miles per hour have been attained, and though the tires have become very hot they have neither melted nor suddenly disintegrated in any other way by reason of it. The error in your calculations would seem to arise from your assumption that the air only travels in the inner tube in one direction as the result of expansion, and that direction must necessarily be the reverse of that in which the wheel is turning. If we assume, for instance, that, with the revolution of the wheel, as each point comes round and makes contact with the ground, its meeting is similar to a blow, of which the expansion is the result, it will be evident that the air must travel in opposite directions away from the point of contact. Owing to the forward travel of the wheel and the manner in which it meets obstructions, it is probable that this is not equally divided vertically, but that a larger fraction of it is toward the rear from the point of meeting, and, consequently, in the same direction as the wheel is traveling. Expansion is always along the line of least resistance, and as there is nothing to prevent the air in the tire traveling one way round it to the exclusion of the other, it is evident that it takes both ways round, and, meeting half round, the force of each stream is counteracted by the other, so that there is no constant stream of air circling the tire at a tremendous velocity such as you have figured out. Take a piece of ordinary garden hose long enough to make the equivalent of a tire, and bend it in circular form; hold it upright and strike it a blow with a mallet at the point it touches the ground, and the conditions under which a tire travels will, in a measure, be simulated. If there be any means of measuring the force of the air issuing from each open end of the hose as a result of the blow it will undoubtedly be found to be approximately equal in each case. There is little doubt but that a very large proportion of the alleged punctures are "ruptures" of the inner tube, but if the truth were told they would be called "pinches" due to carelessness in putting the tire on. If there are any of our readers who have had any experience of the nature in question, and can amplify the foregoing, we should be pleased to hear from them.

The Balancing of Engines.

Editor THE AUTOMOBILE:

[574.]—I have never fully understood the balancing of different types of engines, and would very much appreciate an explanation in your columns "Letters Interesting and Instructive." I can understand that a two-cylinder, opposed motor is in balance. I am told that a vertical two-cylinder motor with cranks 180° apart is in balance as to its reciprocating parts, but that there is some sort of accelerating force not compensated for. This is not clear to me. Does a four-cylinder vertical engine overcome the difficulty, if there is one? What forces in a vertical, single-cylinder engine have to be counterweighted? Does the balancing hold good for all speeds? If not, why not?

New York City.

There are a good many factors to consider in the balancing of motors, by which it is sought to avoid undue vibration. The most obvious factors to be considered are, of course, the balancing of impulses and of moving parts. All that can be done with respect to the former is to cause them to occur at definite and invariable intervals during the crankshaft rotation. The balancing of moving parts is less simple. A horizontal-opposed motor is in very good mechanical balance because the pistons approach each other and recede at rates that are at all times the same for both pistons.

With a vertical motor the movement of one piston down does not balance that of another piston up, because of the angularity of the connecting rods. Because of this angularity, when the throws on the crankshaft are horizontal, both pistons are materially below the center of the stroke, as you will realize if you conceive one of the pistons held in place and the bottom of its connecting rod released from the crankpin and swung into a vertical position, in which position it will reach materially below the center of the crank circle. And, since in turning from the horizontal position to a vertical position of the crank throws, the rising piston must travel more than half a stroke and the falling piston less than half a stroke, it follows that they move at differing speeds, and thus do not exactly balance each other. Another condition that arises with a vertical, multicylinder engine is due to the presence of a rising piston at one end of the range of cylinders with a falling piston at the other, this action tending to produce a rocking motion from end to end of the motor. A counterweight on a single-cylinder motor is designed to balance the weight of the connecting rod opposite it, besides partially balancing the piston. Such balancing does not hold good for all speeds because the balancing effect varies at different points in the revolution, with the result that the motor cannot run evenly, besides which the variations in torque are not compensated for.

A Case of Leaky Valves and Defective Coil.

Editor THE AUTOMOBILE:

[575.]—I have read with considerable interest communication 542 which appeared recently in "The Automobile," under the head of "Letters Interesting and Instructive." In view of the fact that I have experienced very similar difficulties with my four-cylinder 22-horsepower European automobile, I might add, however, that one of the difficulties I have experienced is the failure of the engine to occasionally respond to the throttle when it is opened, whereas, one would fully expect the engine to fairly roar when the throttle was opened wide, particularly when running on the intermediate gear.

Quite recently I noticed a coating of oil or fluid on the top of the last cylinder and on close investigation I found that this oil was oozing through the cap which screws into the head of the cylinder, but whether or not this defect would have the same effect as the leaky valve described by you, I am unable to say. Can you give me any information on this point? I would also like your explanation of the following:

As a result of my search for these difficulties, I quite recently learned of a short circuit in my coil box. The ignition on my car is by means of a magneto and a set of accumulators, and in the coil there is provision for a short circuit between a lever and one of the terminals for the purpose of preventing the coil burning out. It is at this particular point that the short circuit occurs.

Toronto, Ont.

OSLER WADE.

Without more definite particulars or a personal inspection of the car, it seems difficult to ascribe the condition such as outlined by our correspondent in letter 542 to be due to anything but poorly fitting valves, and if the symptoms of your trouble are identical with those there outlined, we should recommend the same remedy. Occasional failure to respond to the throttle might be ascribed to a sticking auxiliary air valve or similar temporary derangement of the carbureter that would radically alter the character of the mixture. It does not seem possible that the fluid you describe as oozing from the cylinder cap can be oil; it is water from the circulating system, as the cap in question closes the water-jacket, this opening being left in order to permit of access to the walls of the water-jacket, so that it may be cleaned of sand and the like after casting. Such a slight leak as you describe can have no possible effect on the running of the engine. Remove the cap, clean the threads both of the cap and cylinder, and smear them well with litharge, then screw up again. This will undoubtedly cure the leak, and perhaps merely a half a turn or so may prove just as effective without removing the cap at all. Try tightening the cap a bit, and if the leak still persists, give it the above treatment.

Regarding the short circuit you speak of, we judge from your description that the coil-maker has provided a sort of over-load relief. In other words, there is a gap in the secondary circuit presenting a greater resistance than that of the spark

plug, but not too great for the coil to safely bridge. Should the spark plug points be too far apart, or for any other reason a resistance greater than that ordinarily presented by the plug be interposed, as by the falling free of one of the plug cables, the spark will immediately bridge this relief gap and the coil will not damage. This is because of the fact that if the resistance between the two exterior terminals of the secondary winding is greatly in excess of the capacity of the coil to bridge, the current is apt to break down the insulation by jumping from layer to layer, usually termed "burning out." The fact that there is an occasional short circuit at the point you mention seems to be indicative of dirty plugs, points too far apart, or some similar cause that has raised the resistance of the gap considerably above that for which the coil was designed, and the safety device has come into play. Clean or adjust the plugs, or replace them with new ones, and note the effect by running the engine and watching for a short circuit at the point in question. If it still continues, inspect the wiring for breaks. It is possible that something has struck the lever you mention, causing it to come nearer to the terminal in question, so that the safety gap is now much less than it was as originally designed. Spark-plug points are seldom set more than 1-16 inch apart, and usually less. Probably 3-8 or 1-2 inch would be about correct for the safety gap, as this would represent a vastly greater resistance than that of the plugs, but would still be within the safe capacity of the coil. The necessity for safeguarding the coil as well as the why and wherefore of it appear to constitute something that even well-versed autoists are not conversant with in very many instances. We should like to hear the outcome of your investigation.

Some Piston Ring Considerations.

Editor THE AUTOMOBILE:

[576].—What is the theoretically-perfect form for an efficient piston ring, and can it be realized practically? If in your answer you can give something bearing on the comparative merits of the different constructions most used, I am sure that there are others of your readers besides myself who will appreciate it.

Jamestown, N. Y.

MILTON HOWELL.

A theoretically perfect piston ring would bear evenly and with the same pressure against the cylinder wall all the way around. Such a ring is impossible to make practically, though excellent approximations are secured by several methods. Of the principal types of rings in common use, it can be safely said that any of these, when well made, are thoroughly serviceable. What is probably the commonest type, the eccentric ring, theoretically should taper to an infinite thinness at the point where it is split, as only by such design could it be possible to secure even springing all around. Practically, of course, considerable thickness must be left, even at the thinnest point, to fill the groove and provide the necessary strength. By hammering the inside of the ring—a common practice—the springiness is reduced and increased at such points as require it. Rings made very light and small, and held in contact with the piston wall by supplementary springs of one sort or another placed behind them, have often proved capable of giving better service than any other kind.

HOW A STANLEY AGENT FEELS ABOUT IT.

Editor THE AUTOMOBILE:

[577].—I have noted several editorials and remarks in your magazine to the effect that "freak sprinters" are doomed and that the failure of the whole Ormond meet this year, was a failure largely owing to the entrance of the Stanley cars, which would seem to be rather a good ad. for these cars if the 60, 90, 120 and 200-horsepower cars were afraid to enter in competition with the 20-horsepower Stanley cars.

Granting that the Stanley racer was to some extent a freak, if you strip off the elongated aluminum cover, and put on an ordinary body, it does not come as near being a freak as most of the freak gasoline cars entered, which are absolutely no use except on a Vanderbilt cup course or on a stretch of beach like Ormond, and I'll venture to say that the so-called Stanley freak could get out on an ordinary road and give some of those 120-horsepower racing freaks cards and spades and beat them out.

I was at Ormond two years ago when Louis Ross cleaned out about everything there, and if there is anything that comes any nearer being a freak than Mr. Bowden's eight-cylinder "Flying Dutchman," I'd like to see it, and I noted that many of those large gasoline racing freaks had about all they wanted to do to get up the hill off the beach, they were geared so high.

Then, too, last season, the 200-horsepower Darracq was a racing freak purely and simply, and could hardly have stood on a trip over an average country road.. I saw Mr. Croker's car after it was wrecked, and from the pictures I have seen of the Stanley racer I notice that Croker's car was more of a wreck than the Stanley, notwithstanding the fact that some of the papers have said it was so light that it all went to pieces.

When you are belittling steam and the Stanley cars, and giving reports of the races, why do you not give the reasons when a Stanley was compelled to withdraw; but instead, you say "They seemed to lose power and pulled out," when you know very well or could have known that in one instance the check to the gasoline pressure pump got stuck, consequently the fire would not give them the required steam, and when a fully equipped touring car is driven a mile in something like 40 or 45 seconds, I think it was, you hardly notice it, but still continue to stick to it that these cars are of no use but to sprint. How about the 15-mile race last year, when a Model H car beat everything and made it in 13:42.5? How about the five miles which Stanley made in 2:47.1-5? Two years ago Mr. Ross said the only mistake he made was that he did not enter in the 50 and 100-mile race. He could have stopped and taken water and then won out. This year they had hard luck on those races, but the cars entered were in no sense freaks, and I contend that the most of the large gasoline cars with the seat on the rear axle and geared only for a level are absolutely useless except on a race track, and are in a way as much freaks as the Stanley racer.

Personally I think freak racing either with steam or gasoline cars amounts to little, but if you are going to bar out a steam freak, be square and bar out gasoline freaks as well.

E. A. BRODIE,

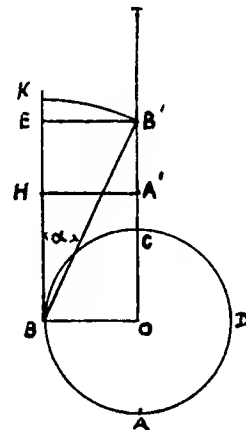
Agent for Stanley Car.

Burlington, Vt.

ANOTHER CONTRADICTION FOR MR. BOOREAM.

Editor THE AUTOMOBILE:

[578].—Referring to letters regarding crankcase breathers in the issues of "The Automobile" of December 13 and January 17, I herewith submit a trigonometrical proof that you were right and J. F. Booream was wrong, as to the angularity of connecting rod affecting the volume contained in crankcase, etc. As an actual fact the volume would vary over 78 cubic inches in a four-cylinder engine 5 x 6 inches, with 10-inch connecting rods. For instance, let ABCD be the circle described by crank;



and OB equals r equals length of crank; and AA' equals BB' equals CC' equals l equals length of connecting rod; and A & A', B & B' and C & C' represent respectively the positions of crank and piston wrist pin at bottom of stroke, after crank has revolved 90 and at top of stroke. Let α equal the angle piston rod makes with vertical, when crank has revolved through first 90°. Describe arc B'K through B' with B as center. Draw horizontal lines E B' and H A' through B' and A'. Then AO equals HK equals r equals vertical distance traveled by crank in revolving through first 90°.

And A'B' equals distance traveled by piston during same period. But A'B' equals HK minus EK. And EK equals $l \text{ versine } \alpha$. Therefore A'B' equals $r \text{ minus } l \text{ versine } \alpha$.

Now as long as l and r bear some finite relation to one another, "l versine α " must have some finite value;

And, as total distance traveled by piston from bottom to top of stroke is equal to 2r:—

It is plain that the distance traveled by piston while crank is revolving through the second 90° is greater than the distance traveled while crank is revolving through first 90°. The difference is equal to $2l \text{ versine } \alpha$.

To put the above in other words: In a four-cylinder engine, the displacement due to the downward moving pistons is not at all times compensated for by the upward moving pistons.

New York City.

W. C. STEARNS.

AUTO CABS IN THE GREAT WORLD CENTERS

By W. F. BRADLEY

NEW YORK, Paris, London, Berlin, all have their transportation problem, and have all in a greater or less degree called upon the automobile for a solution. Geographical and topographical conditions as well as local custom vary the problem in every center, and call for correspondingly different treatment. New York is compact, dense, bustling; its system of elevated, surface and subway cars—the most complete in the world—is perfectly suited for its peculiar conditions. London is vast and varied, has a tremendous area open to similar treatment to that of New York, and a center so dense that surface cars are an impossibility, hence a special treatment of the transportation problem. Paris is compact, easy-going, combines pleasure and business in about equal proportions, and has a well-developed esthetic trait.

The Origin of Motor Cabs in Paris.

At the present time Paris and London make an almost equal though widely differing use of the automobile for public transportation service. Four years ago the only public automobiles in Paris were a score or so of gasoline cars, which hung about the national opera house, and a small number of electric cabs somewhat similar to those at present in use in New York. The gasoline cars were ancient models, frequently owned by their drivers, had no definite scale of charges, and were mostly patronized by visitors to the city. Some of the drivers were proud of the antiquity of their machines, and if you were inclined to listen would tell a wonderful story of Daimler's personal connection with the vehicle. The electrics were heavy, slow and never found favor with the public.

Paris has always been well supplied with horse cabs, light vehicles, open in summer, closed in winter, pulled by a lean

horse and driven by a fat cabby, for thirty-five cents, including tip, you could travel from one end of the city to the other. They were so cheap, so handy, that everybody used them, frequently in preference to omnibuses and subway trains. The taximeter system was introduced, fares being made proportionate to distance traveled, but the scale still being kept very low. After a brief dispute the scheme was a huge success, the public and drivers alike asking for its extension. The motor cabs adopted it and increased a little in popularity. About eighteen months ago a company placed on the streets of Paris a number of Renault automobile taximeter cabs. From the outset they were an unqualified success. From 100 their numbers were increased within a few weeks to 250, and in a few months' time they will number about 600. Alive to the possibilities of this branch of automobiling a dozen or more firms produced automobile cabs and offered them to the cab companies and other corporations. The offers were not all accepted, many of the imitators being inferior to the original article. At the present time, however, in addition to the Renault cabs there are a small number of Panhard, Chenard & Walcker, Unic, and Bayard-Clement machines specially built for this service. In addition a number of schemes are afoot for the increase of automobile cabs, and several of the most important French factories are busy on chassis for cab service. Darracq is at present perfecting a cab, to be turned out in huge series; Panhard is doing the same, and the Bayard-Clement people have just produced a special chassis which will be extensively adopted in more cities than Paris. Judging from the number of cabs now on order, and the inquiries afoot, the five or six big companies operating horse cabs will in two years time have entirely transformed their service and the public horse-drawn cab will no longer exist. On a moderate estimate, Paris alone will have



RENAULT TAXIMETER AUTO CABS IN FRONT OF THE HOTEL SCRIBE ON THE BOULEVARD DES CAPUCINES, PARIS.



NEW BAYARD-CLEMENT CAB CREATION.

eight or nine hundred motor cabs at the end of the present year. The Renault, which inaugurated this change, has a two-cylinder engine in one casting, 75 by 100 bore and stroke, mechanical valves, automatic carbureter, ignition by magneto and sparking plugs, thermo-syphon water cooling, and is rated at 8 horsepower. Simplicity and accessibility are two of the most valuable features of this car. The Renault method of placing the radiator behind the engine has special advantages for cab work. There are no control levers on the steering wheel, the speed of the engine being regulated by a small controller on the dashboard, from three to twenty miles an hour being thus obtained. The pedals are but two in number, one operating the clutch and brakes, the other being an accelerator. There are three speeds ahead and reverse, transmission is of sliding gear type, and drive through propeller shaft and rear live axle, as in all Renault cars. The dimensions of the chassis are special; the rear width is 35 inches, the front width 25 inches, the track 54 inches. This gives an enormous steering angle, and the car can be turned round in a 23-foot street without the use of reverse gear. A landaulet body is carried, with ample room for two people on the rear seat, and place for two more on a folding seat. In a moment the cab can be transformed from a completely closed to an open vehicle with glass front. This type has been found the most suitable and has been adopted by all the companies.

Bayard-Clément Produced an Excellent Model.

One of the most interesting of the Paris cabs is one just produced by the Bayard-Clement Company. The Compagnie Générale des Petites Voitures à Paris, the largest and oldest of the Paris cab companies, asked for a chassis to replace their horse vehicles—cheap, simple, easily dismantlable, and impossible to put out of commission even by unskilled horse-cab drivers. It was a difficult bill to fill, but the company filled it. The chassis has a four-cylinder engine, 75 bore by 90 stroke, giving 14 horsepower at 1,200 revolutions, the four cylinders, gearbox and upper part of crankcase being a single casting. The entire block, motor, clutch, gear box and pedals, is attached to the chassis by three-point suspension.

The lower part of the crank case remains permanently attached to the frame, forming a huge oil tank. By withdrawing six bolts the entire motor, together with the crank shaft and the oil pump, can be dismantled. If repairs are necessary, the chassis can be relieved of its motor in half an hour. Thirty minutes more and another engine can be put in its place, for no adjustment is necessary on the chassis, and there is no delicate alignment of crank shaft and gear box. To obtain the maximum of accessibility the radiator has been placed behind the engine and against the dashboard, as in Renault machines. Water circulation is by thermo-syphon; the water tank forms a frame around the radiator, and a draught of air is assured by a large fan. Ignition is by Lacoste magneto, the carbureter is automatic and has its air inlet completely surrounded by the exhaust; lubrication is of force-feed type, regulated by a small lever on dashboard; clutch is leather-faced cone type, with a special arrangement allowing the spring

to be quickly changed; transmission is through sliding gear, giving three speeds ahead and reverse, with shaft drive. A remarkable feature is that the bevel gear, differential and rear axle housing is a special one-piece stamping. Another new feature is that the driver is seated at the left-hand side, the brake and change speed levers being in the center. The body work is similar to the standard type in use in Paris, a speaking tube communicates with the driver, and of course the taximeter is fitted. The Darracq cab is now undergoing tests, and particulars are not available for publication. It has a single cylinder engine, 90 by 120 bore and stroke, developing 8 horsepower, and shaft drive. The Panhard cab is a three cylinder of about the same horsepower; the Chenard & Walcker, a number of which have been bought by Paris cab companies, is a 15-horsepower four-cylinder vehicle.

Motor Cab Fares Are Not High.

In fixing a scale of charges for the automobile taximeter cabs account had to be taken of the low scale in vogue for horse-drawn vehicles, the minimum fare for which is 15 cents for any distance up to 1,300 yards. The automobile cab fare for two people is 15 cents for 984 yards. A one-mile journey would cost 20 cents, for after the first 984 yards the rate of travel is but two cents per 328 yards. No wonder with such low rates, quick travel, comfortable vehicles, a mechanical instrument for registering the exact fare, and precluding all possibility of dispute with the driver, that the cabs should have been a success. The drivers are paid a fixed daily wage, and in addition receive a certain percentage of the takings above a minimum amount. Each man buys his own gasoline, an equitable allowance being made off the daily takings for this purpose. The allowance has been arrived at, after very exhaustive tests on various kinds of city runs. By careful driving a small sum can always be gained on the fuel allowance.

London has devoted all its attention to the development of the motor omnibus, and has been so active in this direction that there are now about one thousand buses in service. London traffic is too dense to allow street surface cars in any but the suburban districts, and the horse-drawn bus remained the only surface communication until it was ousted by its gasoline rival. Automobile cabs in London are rare. They, as well as the horse-drawn vehicles, are operated on a system of distance fares, as in New York. If strictly enforced, the fares would not be excessive; but it is rare for them to be applied justly, and whenever a dispute occurs, it is the traveler who pays the bill. The taximeter system is not used; its mere mention has always called forth a strong protest from the autocratic London driver. After Paris, cabs are more common in London than any city in the world. English capitalists have realized the possibility of replacing the horse vehicle by the gasoline cab, and the next two years are likely to see a change as great as that just accomplished in the



CHENARD & WALCKER CAB A SPEEDY ONE

'bus service. Five hundred Renault cabs, similar to those in Paris, are already on order, and will be running this year, Darracq is said to have booked a big order for their new type of cab, Bayard-Clement is negotiating, and several of the smaller French manufacturers are endeavoring to place series of cabs with London syndicates. All these vehicles will be operated on the taximeter system, and their introduction on such lines will sound the death knell of the old-time horse vehicle.

Only a few weeks ago a new Public Carriage Order was passed by the British authorities making the adoption of the taximeter optional for London auto cabs up to June 30, 1907, and compulsory after that date. The scale of charges which will then come into force is such as will give the auto cab a distinct advantage over the horse vehicle, and with a compulsory taximeter system no one will take a horse cab when a motor vehicle is available. The scale of charges for the automobile cabs is the very moderate one of 17 cents for the first mile and 4 1-4 cents for every subsequent quarter. Thus, a two-mile journey for two passengers would cost

per 656 yards, and 2 1-2 cents for each additional 328 yards, the charge for a one-mile journey being approximately 27 cents.

What New York Is Going to Do.

Compared with European cities, New York cab fares are excessive, even when allowance has been made for the all-round higher cost of living in this city. If the correct legal fare were always applied, there would not be much ground for complaint; but everyone who has made acquaintance with the New York cabby knows that he nourishes a supreme contempt for legalities. Motor cab service has been confined to electric vehicles of a type that Paris and Berlin discarded a couple of years ago. A comparison of fares is practically impossible, owing to the point-to-point system in use here. The rate given by the only company operating electric cabs in New York is \$1.50 for any point between Thirtieth and Fifty-ninth Streets, approximately a mile and a half. The price for the same distance in a Paris gasoline taximeter cab would be less than 30 cents, and for



LONDON AUTO CABBIERS ON TRAFALGAR SQUARE. THEY DO NOT YET KNOW THE BENEFITS OF THE TAXIMETER.

34 cents. The law allows the auto cab companies to charge for luggage and extra passengers, but, as is the case in Paris, the companies do not intend to avail themselves of this permission. The taximeter as used in all European cities is an ingenious instrument which registers the amount due for either distance covered or time occupied. On starting a journey the driver lowers a small metal flag, and instantly 8d. or 75c.—whether you are in London or Paris—appears on the dial. If the cab stops on its journey, or moves at less than six miles an hour, a clock within the instrument comes into operation and advances the figures a mile per ten minutes. It is impossible to hire an auto cab by the hour, but whether the vehicle is moving or standing still the charge will be the same. Very extensive tests made in Paris have proved that on one-hour journeys, whether the cab was standing still, running at a normal speed, or alternately racing and crawling to suit traffic conditions, the fare was practically the same.

Germany was not very successful in her first attempts to replace horse cabs by motor-driven vehicles. Electricians first made their appearance at Cannstadt, but were soon found to be too costly. Berlin, a little later, adopted electric-driven cabs, with hardly more satisfactory results. Finally, the same company placed a number of gasoline cabs on the streets, with rather more success. The Berlin taximeter cab tariff is 17 1-2 cents

this amount two people could be carried as against only one in the home vehicle. There is obviously room for improvement here, and improvement will not be long in coming, for a company is at present being floated to operate gasoline automobile cabs in New York on the taximeter system as known in Paris. Two hundred Renault cabs are at present under construction, and will be running on New York streets within twelve months. The cars will be entirely built abroad, and will be similar in every respect to those in use in Paris and London. Lest visions of a paltry quarter should arise, it is necessary to mention that the Paris cabs will not bring the Paris fares with them. Nevertheless, the promoters of the scheme assure that a lower tariff will be adopted than any at present in use in New York for either horse or mechanically driven cabs. The use of the taximeter, too, will make the cabs immensely popular with the public. There will be no haggling before the journey, nor any bad words at the end of it. Once adopted, the old type of cab will disappear from the streets as rapidly as the horse car gave way before the electric street car. Other important French firms, having produced a cheap and economical type of cab, are endeavoring to find an outlet in New York. Home constructors are looking into this matter, too, foreign systems having been closely studied, and developments are likely to proceed with activity

HIGHER REGISTRATION FEES FOR MASSACHUSETTS

BOSTON, Feb. 11.—The recess committee on taxation of the Massachusetts Legislature, which was appointed last year to consider methods of increasing the revenues of the State, and which held hearings through the summer and fall months at the State House and in various other places, has presented its report. It deals with the question of increased fees for the registration of automobiles, to secure funds to make repairs on the State highways, at some length, and presents with its report a bill which, in effect, is for a graded system of registration fees.

The bill provides, in brief, that all automobiles and motor cycles, except ambulances, fire engines and road rollers, shall be registered with the Highway Commission. In applying for registration the owner shall state the name of the maker of the automobile, number and size of cylinders, character of motor power and the horsepower. Motor cycles, express wagons, trucks and traction engines and other vehicles used solely for business purposes, shall be registered for \$2 each. The registration fee for other automobiles shall be determined by the Highway Commission, which shall take into consideration the damage which such automobiles cause the State highways and the amount of revenue required to repair the damage. It is provided that the registration fee shall not be in any one year less than \$5 nor more than \$15.

The bill further provides that upon the transfer of any automobile in the \$2 class its registration shall expire. An owner of an automobile in the class for which the registration fee is \$5 may be granted a new registration on transfer of his car for \$2. If the owner transferring the car does not give the Highway Commission notice within ten days his registration expires.

Another provision in the bill is that the registration of every automobile in the \$5 or over class shall expire July 1, 1907. After that date the registrations expire on the first of March following the time they are registered. Continuing, the bill reads: "The said commission shall, on or before the first day of February in each year, determine the fees to be charged for such registrations and shall give written notice thereof to each owner or person in control of an automobile as evidenced by the records of its office and subject to such registration fee." Concerning cars from out of the State the bill cuts down the time they may be operated in Massachusetts without a Massachusetts registration to two days.

In section two of the bill the fee for a manufacturer's or dealer's registration certificate is increased from \$10 to \$25. The third section provides that the fees received under the provisions of this act, together with all other fees received by the Highway Commission from automobiles, shall go to the State highway maintenance fund, which is to be used for the maintenance of the State highways and for carrying out the provisions of the act, in sums appropriated by the General Court. The bill contemplates the possibility of the Highway Commission establishing branches for the purpose of registration in other cities, for it provides that application for registration may be made to the Highway Commission, or any agent designated for the purpose.

In its report accompanying the bill the committee says in part:

"We have found a widespread desire for change in the present license or registration system of automobiles. At the various hearings of the committee arguments were convincing and unopposed that these machines have caused and are causing unusual and alarming damage to our improved highways; and that unless steps are quickly taken to check this evil or provisions made for their frequent repair, our State highways must soon lapse into furrowed stretches of broken stone. The occasion for this almost universal complaint is that the roadways of the State, lately constructed at large expense by contributions in way of

taxation from all property, are rapidly being desurfaced and laid waste by this particular class of vehicle, the loose and projecting stone left uncovered rendering the road a source of discomfort to every variety of travel, and in some instances almost impassable. The rapid development of these machines and their increased use upon our improved highways have proved so injurious thereto as to convince those charged with the construction and repair of highways that such sums as the Commonwealth has thought proper to annually appropriate for maintenance will fall far short of the amount needed. Even were the modest fees now required for registration of automobiles devoted wholly to repair, the sums so received would prove wholly inadequate to make good the mischief they accomplish. These conditions have been apparent to owners of automobiles as well as to others; and it has been gratifying to the committee to observe that owners have not opposed additional registration fees proportionate to the damage caused, provided the sums thus received be expended in improvement of roadways. At points adjoining neighboring States, notably in the Berkshires, complaint is made that the injury is caused or largely aggravated by foreign machines, their owners crossing the border to enjoy the beauty of our scenery and the freedom of our roads for a few days only, rendering no return for the ravages of their powerful, swiftly moving touring cars. While the committee realizes that the presence of these strangers is not without some compensating return, it believes a stay beyond the reasonable length required for passage through the State should subject the owner to burdens similar to those imposed upon our own citizens operating cars.

"The Highway Commission has experimented in various ways and with various kinds of rock to produce a good road surface proof against speedy disintegration, but thus far has been unable to produce a surface sufficient to withstand the severe strain of the automobile. This machine, to gather and maintain its headway, seems to break into and loosen the binder, so called; clouds of dust follow in its wake, and are blown away. With the flight of each machine similar results follow, and the roadway is denuded. The Commission has also experimented with oil and tar to preserve the surface, but not as yet with results wholly satisfactory. While it is hopeful of solving the problem ultimately, yet in any event the process must prove an expensive one, the requirement for which is largely due to the presence of the automobile."

HOPES FOR BETTER PENNSYLVANIA LAW.

HARRISBURG, PA., Feb. 11.—Senator Crawford has introduced in the Pennsylvania legislature a new motor vehicle law. It provides for the annual registration of motor vehicles at a charge of \$3, the State issuing tags as at present. Operators, other than the owner, must become "licensed drivers," paying a fee of \$2 and wearing a badge when driving. No person under the age of 18 being permitted to operate a car under any circumstances. Non-residents whose cars display tags indicating the State by which they are issued are exempt from the registration and license provisions for a period of ten days.

The rate of speed permitted is a mile in four minutes where houses are less than 100 yards apart, reducing speed to a mile in six minutes at curves and cross streets. A mile in two minutes where houses are more than 100 yards apart, reducing to a mile in four minutes at curves, cross roads, descending steep hills and passing other vehicles. This is limited by the usual provision forbidding any speed greater than is safe, considering road and other conditions. No local ordinances fixing lower rates of speed are permitted except in cases of parks and boulevards, where, however, the rate shall not be less than that permitted horse-drawn

vehicles and the erection of signs is required. Physicians answering emergency calls and vehicles used by the military, police and fire department are, when in the performance of duty, exempt from speed restrictions.

The customary regulations as to brakes, lights and signal device are included, and operators of motor vehicles are required to give such reasonable notice of their approach as the safety of the public requires, and in meeting animals that appear to be frightened or unmanageable to stop without waiting for signal to do so. An effort is made to place motor vehicles on exactly the same basis as horse-drawn vehicles in the use of the highways and to induce the displaying of a light by all vehicles.

The penalties for the violation of the law are as at present, except that the operation of a motor vehicle by any intoxicated person renders him liable to a fine of \$100 or 30 days' imprisonment.

The rules of the road are plainly indicated and the bill is a decided improvement on the law at present in force. It has the approval of the State Highway Department and is indorsed by the Pennsylvania Motor Federation, as while it protects the public in their use of the highways it will tend to free automobilists from the petty persecutions of the past two years. Should this bill become a law the present method of licensing would continue in effect until the end of the current year.

MISSOURI LEGISLATION UNCERTAIN.

JEFFERSON CITY, Mo., Feb. 9.—Missouri automobilists, at least those of the Automobile Club of Kansas City, have given up the ordinary methods of securing legislation favorable to them and have employed an attorney to represent them at the capital of Missouri. The automobile which was abroad on the streets of this picturesque city to demonstrate to rural legislators the delights of motoring, has been sent back to St. Louis, where it should have remained in the first place. It only gave the fellows who got fewer rides than the others a chance to line up against a more liberal law.

There was a hearing before the joint committee of jurisprudence of the house and senate. From Kansas City there were C. C. Madison, R. J. Ingraham and O. A. Lucas, attorneys for the club, and H. G. Blakeley, secretary of the club; from St. Louis, Roy Britton, secretary of the St. Louis Automobile Club, and Judge James Seddon. All of these argued in favor of the bill, while Representative Brooks, who has a bill requiring owners to give bond before being permitted to operate their cars, spoke against it. The committee did not agree on a report. A Kansas City member, who had been lined up, went over to the opposition. The Kansas City club finally realized that the bill would have hard sledding unless intelligent work was quickly directed toward it, and they began by getting a good lobby of one man. The country members, except those from St. Louis county, are generally liberal, but the St. Louis county members claim the speed nuisance has been so intolerable that it must be checked.

Further interest in the legislature has resulted from the passage by the house of a bill permitting the levy, by counties, of a special tax of 50 cents on the \$100 for road and bridge purposes. The bill is a resolution and will permit the voters of the entire State to vote upon the matter as an amendment to the State constitution.

Other things in the way of Missouri legislation that will interest autoists include a bill by Representative Botsford. It allows a speed of 25 miles in the country, but if a horse is frightened, the name of the autoist must be left with the horse driver. The most novel clause of the bill, however, permits cities to set aside certain streets where speed tests may be allowed at certain hours.

Another bill, by Representative C. A. Willard, of St. Louis, proposes to create the office of State motor vehicle commissioner, who shall have authority to appoint as many deputies as necessary to enforce the speed laws in the different cities of the State. The office of commissioner is to be appointive by the governor and to pay \$2,500 salary annually.

EX-PRESIDENT FARSON ON ILLINOIS LAW.

SPRINGFIELD, ILL., Feb. 11.—Uniform auto regulation in the State of Illinois before the end of this year is predicted by John Farson, ex-president of the American Automobile Association. This is indicative of the spirit which is causing automobilists throughout the State to make a concerted demand on the general assembly for better laws. If the present laws relating to automobiling were strictly enforced, Mr. Farson says, not a man in Illinois could afford to indulge in driving. Every city, town and village in the State, he asserts, has practically a different set of ordinances relating to automobiles, and it is only due to the leniency of local authorities that the ordinances are not enforced. Illinois should give automobilists a uniform speed law—one which would enable drivers to know just what speed can be made in any part of the State.

"At present the speed limit is absurd," said he. "An old lumber wagon can make better time than eight miles an hour, and that is the speed which the authorities demand we shall not exceed. Under proper regulations and conditions, twelve to fifteen miles an hour in the city and twenty miles an hour in the country would be about right. At the present time in Chicago there are a number of different laws affecting speed. The city has one ordinance and the park boards each have different rules, which, if violated, arrest and fine immediately follow. I know one of the park boards has a rule that automobiles must toot their horns at crossings, and another has an ironclad regulation that if the horn is tooted at crossing the perpetrator shall be arrested at once. Of course, this all goes to show that a great many reforms must be made. The bill which is now before the legislature takes all these into consideration, and I believe they will be acted upon favorably. Other States are beginning to see that the automobile is bringing good times and prosperity with it and they are grateful in many ways. In Illinois about the only persons who think of the automobile as a sign of prosperity are the country constables."

VERMONT'S LOW RATIO OF AUTO ACCIDENTS.

ORWELL, VT., Feb. 11.—A Vermont paper—the *St. Albans Messenger*—has compiled statistics which show that the automobile killed only one person in Vermont in 1906, while horses, in various ways, were responsible for fourteen violent deaths. Of course, auto and horse are not in the strict ratio of 1 to 14; but, laying aside mathematical accuracy, one death in twelve months in a population of over a third of a million is not a positively murderous record to chalk against the chauffeur.

Inasmuch as the Vermont legislature has not seen fit to make automobile laws in accordance with the views of Colonel Joseph Battell, of Middlebury, who is well known throughout the State as an ardent hater of automobiles and an equal lover of the horse, autoists now commend his efforts in the direction of abolishing electric cars, railroad trains, firearms, poisons—in fact, anything that ever causes death by accident—except the horse.

REGISTRATION LAW IN KANSAS.

TOPEKA, KAN., Feb. 11.—A bill providing for the registration of automobiles has passed the Kansas house by a vote of 65 to 15 and is now in the hands of the Senate. It provides that all automobiles in the State of Kansas shall be registered with the secretary of state, the registration fee being two dollars. This regulation, does not apply to traction engines, bicycles and tricycles. In making the declaration of ownership, the automobilist's name and address, the seating capacity of the car, the maker's name and color of machine shall be given. Registration numbers shall be carried in the front and rear, shall be in figures not less than six inches high, of proportionate width, and of a color to render them easily distinguishable. Penalties for violation of the act, which shall come into operation from May 1, 1907, are a fine of not less than ten dollars nor more than fifty dollars.

FEBRUARY ACTIVITIES OF THE AUTO CLUBS

Hawaii Prepares for its Floral Parade, February 22.

HONOLULU, HAWAII, Feb. 1.—At a meeting of the Automobile Club last night the matter of the annual floral parade came up and aroused a great deal of enthusiasm. Preparations are being made to eclipse last year's affair, and the fact that there are now 106 automobiles on the island instead of fifty-five, as was the case a year ago, promises well for the success of the parade. E. F. Bishop, on the part of a number of autoists, accepted the invitation of the parade committee of the club, requesting the co-operation of individual owners.

A number of other subjects were taken up at the meeting which was well attended, after the matter of the floral parade had been disposed of. Chief among these was the question of good roads. Chairman McCandless, of the good roads committee, reported the result of an interview he had had with Supervisor S. Dwight, who said that attention would first be paid to putting the roads along the water front in good shape, after which King and School streets would be looked after, while the other roads about the city were to be put in shape and the damage caused by the recent storm repaired as soon as possible. It was his ambition to secure at least \$15,000 a month for road work and in this he was supported by the other supervisors.

Mr. McCandless' report was followed by a general discussion of the road question. The manner in which oiled roads had withstood the severe storms was cited in their favor, and the use of bitumen was also suggested, a test strip of this type of road having been laid on Queen street and proven quite successful, its only drawback being its heat holding quality. It was decided to extend an invitation to Samuel C. Lancaster, of the good roads branch of the Department of Agriculture, who is shortly to deliver a series of illustrated lectures on road making throughout the West, to come to Honolulu.

New Jersey A. & M. C. Preparing for Endurance Run.

NEWARK, N. J., Feb. 11.—At a meeting of the board of governors of the New Jersey Automobile and Motor Club held last week, initial steps were taken for the first annual endurance contest of the club, which according to present plans will take place sometime this spring. The matter was thoroughly discussed at the meeting and a committee was suggested to look after the details of this event. H. A. Bunnell, secretary of the club, has been named as chairman of the endurance committee, but other members of the committee have not yet been selected, as it was not deemed advisable to select the other names until later, when it can be learned definitely those members who will be able to do the work that will fall to this committee.

It is expected that within a few weeks the committee will be in working order. Every member of the club is in favor of the contest, and there will be ample support, even so far as contributions for prizes in silver cups to winners in the big event.

The committee's real work will be in selecting a suitable route over which the contest will be run, and rules to govern the contestants.

National Association of Autoists for Canada.

MONTREAL, Feb. 11.—Rumor has it that a convention of automobilists embracing the Dominion of Canada, will be held in this city during the week of the Automobile and Sportsmen's Show, April 6-13, for the purpose of organizing a national association for Canada. The Automobile Club of Canada, whose headquarters are here, will take the initiative, and an organization similar in character to the American Automobile Association is likely to be formulated.

How Pittsburgers Secured the Signboards.

PITTSBURG, PA., Feb. 11.—The action of the Automobile Club, of Pittsburg, in securing the erection of road signs in Allegheny County, is one that should be followed by all other clubs in that as well as other States where similar laws exist. A year ago the club sent a committee to the county commissioners asking that the roads in the county be properly marked, as the few signs that were then in place were nearly all illegible. They were informed that under the existing laws the township supervisors were required to maintain such signs.

The matter was presented to the court and on the next quarterly return day constables were instructed to see that proper signs were erected at all cross roads. The following return day officers who failed to carry out the order of the court were given to understand that the matter must receive immediate attention, and by the time the county roads were in shape to use all cross roads were marked.

Every automobilist who has done any touring realizes the advantages of such signs and the annoyance of finding himself at an unmarked fork or cross roads. The desired results were secured in this case by the expenditure of perhaps an hour's time, and other clubs and individuals should profit by it and take similar action.

Aero Club Banquet Proposed at St. Regis.

NEW YORK, Feb. 11.—The first banquet of the Aero Club of America will probably take place at the St. Regis Hotel early in March. The speakers will include many prominent aeronauts.

For the Gordon Bennett International Aeronautic Cup Race at St. Louis in October next fifteen balloons have been entered, three each from the following clubs: Aero Club de France, Aero Club of the United Kingdom, Real Aero Club de Espana, Deutscher Luftschiffer-Verband, Aero Club of America. The entry is only one less than the number of participants in the race of 1906. If the three late Italian entries are accepted the 1907 race will have two more participants than its predecessor.

The Aero Club is now located at its new quarters, No. 12 East Forty-second street, where a comprehensive library of aeronautics is available to members. The telephone is 4321-38th. A committee will be appointed in the near future to prepare a set of rules, covering contests for the prize to be given for heavier than air machines without gas.

It is proposed to have a balloon ascension at Washington on Washington's birthday. Members have been asked to submit designs for a club flag.

The Cleveland Club's Ideal Road Is Assured.

CLEVELAND, Feb. 11.—Secretary Asa Goddard, of the Cleveland Automobile Club, says that the new road to be constructed under the auspices of the club will be one of the finest stretches of highway in the country. It will be built on the principles of the old Roman roads which have stood for centuries. The aim will be to get the foundation right; then, if the project runs a little short of funds, a little less money will be spent on the surface until such a time as it can be resurfaced. The foundation will be two and a half feet of rock with eight inches of chipped stone or coarse gravel on top of that. The new highway will take the place of the worst stretch of pike between Cleveland and Buffalo. The club has made another call on the automobile owners of Cleveland, calling attention to the deplorable condition of the highway east of Cleveland, and of the good work which the organization hopes to accomplish. Small donations are asked from all owners in this vicinity as well as from the farmers along the proposed route. Judging from the manner in which subscriptions come in, the success of the enterprise seems assured.

Long Islanders Want Eastern Parkway Extended.

BROOKLYN, N. Y., Feb. 12.—Entertainment in the shape of a smoker and vaudeville programme was the order of the evening at the Long Island Automobile Club last Friday, February 8. Members brought their friends and there was a large gathering, many of whom come in cars despite the condition of the streets. At the last meeting of the club a resolution was passed approving of the extension of Eastern parkway through Cypress Hills cemetery. The Jamaica Automobile Club is also lending its assistance in the matter and the aid of local politicians has been enlisted. Secretary Pierson, of the Long Island Club, has also been instrumental in taking up the matter of shipping autos abroad without crating, but as yet the steamship companies do not consider it practicable to do so. At the next meeting of the club, the Matheson, Oldsmobile, Winton and American Motors cars will be placed on exhibition.

Missourians Protest Against High Toll Rates.

KANSAS CITY, Mo., Feb. 9.—The Automobile Club of Kansas City, to which was extended an invitation to assist in the dedication of the mile and three-quarters-long viaduct which connects the two Kansas Citys and spans the Kaw river, refused to participate in any parade because the rates on the viaduct, which charges toll, are too high. The club informed the officials of the project that it could give no parade, as to do so would be practically to sanction the use of the viaduct. The rates the autoists object to are 35 cents for runabouts, the same as for a four-horse team, and a higher toll for larger vehicles. This is the only toll proposition in Kansas City and vicinity, except one bridge across the Missouri river, and autoists are preferring to tread their way among switchtracks in the bottoms until the rate is made reasonable for passage over the asphalted surface of the big bridge.

Marylanders Tour to Washington in May.

BALTIMORE, Feb. 11.—Now that the local auto show is a thing of the past, the Automobile Club of Maryland is preparing for some very interesting events to be held in the near future. Besides the H. M. Rowe Touring Contest, an endurance test to Washington will be held in May under the auspices of the club, which is now recognized as the great leader in everything automobiling south of the Mason and Dixon line. This test will attract a huge entry list, as every one of the local dealers will be interested to see that at least one of the cars he represents is sent over the rough and hilly roads that connect the two cities. A better course could not be found, as the road conditions are excellent for the purpose, and the course is well known to most of the local autoists.

Germantowners' Annual Banquet a Memorable Affair.

PHILADELPHIA, Feb. 11.—The handsome banquet hall of the Automobile Club of Germantown, was crowded on Friday night last, on the occasion of the organization's third annual banquet. Besides a full turn-out of members, many men prominent in city and State were present as guests, among them being State Senator W. C. Sproul, City Solicitor John L. Kinsey, E. T. Stotesbury, Peter Boyd, J. Hector McNeal, Isaac Starr, Jr., and others. The good roads feature was kept prominently to the fore throughout the evening, all the speakers having something to say on the subject. The Germantown organization is the sponsor for the proposed Philadelphia-Pittsburg highway, and has succeeded in interesting many prominent automobilists and legislators in the project.

Quakers Elect Charles J. Swain as President.

PHILADELPHIA, Feb. 11.—The first annual meeting of the Quaker City Motor Club was held at the club's quarters in the Hotel Majestic last Thursday night. Nearly 200 members were present. The election resulted in the choice of the following

officers to serve during the ensuing year: President, Charles J. Swain; first vice-president, George H. Smith; second vice-president, C. C. Fitler, Jr.; treasurer, A. T. Stewart; secretary, Theodore B. Creamer. The board of governors will be made up of Messrs. Swain, Smith, Fitler and Stewart, and G. Douglas Bartlett, E. C. Leeds, Nathaniel Hathaway, E. Hubbard Fitch, E. C. Johnson, A. E. Maltby, W. Wayne Davis, G. Hilton Gantert and I. D. Berger.

CLUB ITEMS OF INTEREST.

PHILADELPHIA.—The annual banquet of the Automobile Club of Philadelphia is scheduled for Friday, March 8, at the club house, 1409 Walnut street. A number of automobilists of national fame have been invited.

CLEVELAND, O.—The Cleveland Automobile Club is making great efforts to be a source of information to every resident autoist as well as to visitors. The name and address of every registered owner in Cleveland will be kept in a card index, this being but one of the many innovations along this line introduced by Secretary Asa Goddard.

WILLIAMSPORT, PA.—Organized with but forty charter members recently the Williamsport Automobile Club now has one hundred on its rolls and applications of fifty more waiting to be passed on. The club will devote its attention very largely to road improvement, and will hold a hill climb on Grampian Hill, which has about a 1,000 foot rise, as soon as the weather is favorable.

GRAND RAPIDS.—The local automobile club has not been the center of much enthusiasm during the past year, but new blood is now expected in the organization, and the club is making many plans to make up for lost time. If a new talked of University club is formed, it will probably become a part of that. A new club house has been planned at Cascade, 12 miles from the city.

CHICAGO.—A number of motor boat enthusiasts have got together here and formed the Illinois Motor Boat Club. The officers are as follows: Commodore, Theodore Weise; vice-commodore, M. L. Ames; rear-commodore, John Clark; secretary, W. H. Hungerford; treasurer, O. N. Hanson. The managing board is composed of the following: William Hoffman, Thomas O'Hearn, Edward Hester, Charles P. Crouch and William P. Weren.

BOSTON.—At the first fortnightly "smoke talk" of the season held by the Bay State Automobile Association, the subject was that of magnetos, and was gone into at some length by Harold H. Brown, who also spoke of the lessons of the New York show. The Bay State Association contemplates expanding and to that end extra quarters adjoining the present building have been secured; the rooms will be enlarged to provide for about seventy-five additional guests and a billiard room will be installed on the second floor.



THE MODERN HIGHWAYMAN.—From *Life*.
COUNTRY OFFICER: "Fifty dollars, sir! You were exceeding the speed limit."

THE AUTOMOBILE CALENDAR.

AMERICAN.

Shows.

- Feb. 18-23.....—Buffalo. Fifth Annual Automobile Show, Convention Hall. D. H. Lewis, manager, Teck Building.
- Feb. 18-28.....—Cleveland Automobile Show, Central Armory, Cleveland Automobile Trade Association. George Collister, manager.
- Feb. 18-25.....—San Francisco, Golden Gate Park Skating Rink. Automobile Show, Dealers' Association and Automobile Club of California.
- Feb. 18-25.....—Worcester, Mass., Automobile and Power Boat Show. Automobile Dealers' Association. F. N. Prescott, manager.
- Feb. 19-26.....—New York city. Madison Square Garden, National Motor Boat Show. Captain J. A. H. Dressel, manager.
- Feb. 25-Mar. 2...—Portland, Me., Second Annual Automobile and Power Boat Show, The Auditorium.
- March 2-9.....—Chicago, Second Annual Power Boat Show, Seventh Regiment Armory. W. C. Andrews, manager, 19 E. Huron St.
- March 2-9.....—Minneapolis, Automobile Show, First Regiment Armory, Minneapolis Automobile Dealers' Ass'n.
- March 4-10.....—Kansas City, Mo., First Annual Automobile Show, Convention Hall. Frank L. Woodward, manager, Willis Wood Theater Building.
- March 9-16.....—Boston Automobile and Power Boat Show, Mechanics' Hall and Horticultural Hall, Boston Automobile Dealers' Association. C. I. Campbell, mgr.
- March 18-16....—Omaha, Auditorium, Second Annual Automobile Show, Omaha Dealers' Association. T. Gillan, manager.
- March 18-23....—Providence (R. I.) Automobile and Power Boat Show, Infantry Hall. F. M. Prescott, manager.
- April 1-6.....—St. Louis, Mo., Automobile Show, Jal Alal Building, St. Louis Automobile Dealers' Association.
- April 6-18.....—Montreal, Canada, Second International Automobile and Sportsman's Exhibition. R. M. Jaffray, manager, 809 W. Notre Dame Street.
- April 8-13.....—Pittsburg, Pa., First Annual Show of the Pittsburg Automobile Dealers' Association, Duquesne Garden.

Race Meets, Hill Climbs, etc.

- Feb. 22.....—Los Angeles, Cal., Pasadena-Altadena Hill Climb, Automobile Dealers' Association of Southern Cal.
- Feb. 22.....—Atlanta, Ga., Hill Climb, Atlanta Automobile Association. F. E. Rushlander, secretary.
- Feb. 22.....—Washington, D. C., Aerial Race, Aero Club of America.
- May 30.....—Philadelphia, Hill Climb, Quaker City Motor Club.
- Oct. 19.....—St. Louis, Mo., International Aerial Race for the Gordon Bennett Prize. Aero Club of America.

FOREIGN.

Shows.

- Feb. 16.....—Turin, Italy, Automobile Show.
- March 1-16.....—London, Olympia Commercial Vehicle and Motor Boat Show.
- April 6-13.....—London, Agricultural Hall Motor Show.
- May 4-15.....—Madrid, Spain, Automobile Exhibition, Palace of Fine Arts, Royal Automobile Club of Madrid.
- May 15-26.....—Zurich, Third Annual Swiss Automobile Show.

Race Meets, Hill Climbs, etc.

- Feb. 23-27.....—Voiturette Contest, Automobile Club of Italy.
- March 20-27....—Nice (France) Automobile Week.
- April 1-16.....—Spring Wheel Competition.
- April 21.....—Targa Florio Tour (Sicily), Auto Club of Milan.
- April 25-28.....—Touring Contest, Automobile Club of Touraine.
- April 28.....—Chateau Thierry Hill Climb.
- May 24-27.....—Voiturette Contest, Automobile Club of Austria.
- May 29-June 1...—Irish Automobile Club Reliability Trials.
- June 3-12.....—Herkomer Cup, Automobile Club of Bavaria.
- June 14.....—German Emperor's Cup, Taunus Circuit, Imperial Automobile Club.
- June 24-29.....—Scottish Reliability Trial. Scottish Automobile Club.
- July 1-July 8...—Grand Prix, Automobile Club of France. (Exact date to be decided upon.)
- July 14, 1908....—Paris to London Aerial Race.

CALIFORNIA CLAIMS HIGHEST PERCENTAGE.

SAN FRANCISCO, CAL., Feb. 6.—It will doubtless come as a surprise to the average autoist to learn that California can boast of more automobiles in proportion to her population than any other State in the union, and the same thing is true of her chief city, San Francisco, which sheds some light on the keen interest taken in the forthcoming show to be held there in the newly erected Coliseum, from February 18 to 24, which has a floor space of 75,000 square feet, or more than that of the Garden in New York. Regarding percentages there is said to be one automobile owned in the country at the present time for every 566 people. New York State has one for every 210 people, while California has a machine for every 173 inhabitants. Chicago boasts of an auto for every 377 people, but San Francisco goes this better to the extent of having one for every 133 people. Many of the exhibits that graced the New York and Chicago shows have been sent on by a special train running on a passenger schedule. No efforts have been spared to plan as complete a show as any ever held in the country, and, what with the elaborate decorations and electric lighting, it is confidently expected that San Francisco's first effort will be in every way a counterpart of this season's shows in the East. The railroads have made a special rate of a fare and a third from any part of the State.

KANSAS CITY'S SHOW PREPARATIONS.

KANSAS CITY, Mo., Feb. 9.—Not only having the same decorations but the same designer to install them, Kansas City's show, which is to reign supreme during the week of March 4 to 9, will be a sort of replica of the Madison Square Garden exhibit. The show will be held in Convention Hall; the decorative scheme being modified in accordance with its size as it lacks about a third of the space offered by Madison Square Garden. E. H. Moriarty and J. H. Wittman, represented the Kansas City Automobile Dealers' Association at the Garden show in January, and Harry Houpt, head of the New York Thomas branch said to Mr. Wittman: "If you fellows do business like that at Kansas City, I'm going to wear my old clothes if I ever come West. If I wear a good suit I'll be traded out of it before I get back."

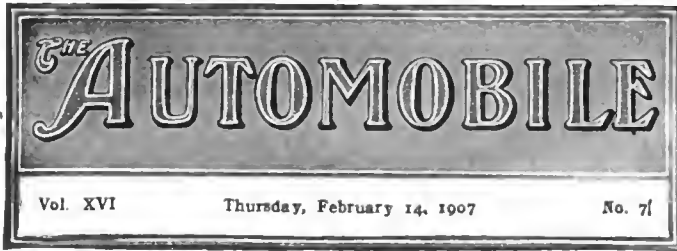
PITTSBURG SHOW TO BE HANDSOMELY DRESSED.

PITTSBURG, Feb. 11.—Green and gold will be the predominating colors in the general scheme of decoration at the automobile show in Duquesne Garden, April 7-13. The floors will be covered with green denim to show the brilliant colors of the cars by contrast. All the signs will be uniform in size and lettering, and will be suspended from the ceiling. The coat of arms lately adopted by the Pittsburg Automobile Dealers' Association is the seal of Pittsburg surrounded by an automobile tire. It will also be shown on the official button for the exhibitors. Cars varying in cost from a \$500 runabout to a \$10,000 touring car will be shown.

NORTH CAROLINA AGAINST AUTO THEFTS.

Senator George H. Bellamy, of North Carolina, has introduced a bill in the Senate of that State to punish the stealing of automobiles. The theft of vehicles is punishable, as it constitutes an infraction of the law, but heretofore automobiles have not been included under this statute. After covering fully what constitutes the larceny of an automobile, the bill concludes by imposing a penalty of four months' imprisonment upon anyone guilty of an infringement of the bill. As soon as the bill has been passed by the Senate its promoter will use his personal influence with Representative Morton to rush it through the House of Representatives. No opposition is expected.

The Western Power Boat Association has been formed by the motor boat clubs of Chicago as a nucleus. Every club in the Middle West will be invited to join.



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The Boundless West Deserves a National Show. Chicago's show demonstrated unquestionably that as long as automobile exhibitions are necessary, one of a national character must be held in the West as well as in the East. These United States constitute a big country which is increasing in wealth and population in the West at greater speed than the present growth of the longer settled East. Furthermore, these Westerners are accumulating worldly possessions and in many instances they are realizing the capabilities and utility of the automobile more thoroughly than some of the conservative Eastern commonwealths where economy is more of a science than it is in the prosperous agricultural and mining States of the West. Distances are greater in the West and the necessity for covering them quickly is as much desired as anywhere else, for even the farmer and the ranchman consider a saving of time as a saving of money. In this growing popularity of the automobile in the boundless West there follows in its trail the unavoidable betterment of the roads and the consequent increase in land values. In the next decade it is safe to assume that many miles of first class highway will be built in Western States, and the automobile manufacturer is taking the West into consideration more than ever before in the distribution of his product. A national distribution of a particular make of automobile is as desirable as a national circulation for an automobile publication. Therefore, the Chicago show, with its large attendance of Western agents, would seem to meet a situation that requires a Western display of automobiles.

Promising Results from the Recent Fuel Test. While the fact that the internal combustion motor as at present in use in such large numbers for the propulsion of the automobile and the motorboat is capable of being run on almost any hydrocarbon sufficiently volatile to be vaporized, has long been known to those technically informed, the possibilities of fuels other than gasoline were but little considered in this country before the passage of what has come to be known as the "Free Alcohol Bill." Legislation of this kind is a thing of many years' standing on the Continent, by reason of which fact a great deal of data concerning the use of alcohol in the internal combustion motor has been collected. European makers and scientists have been experimenting with alcohol and alcohol engines for more than ten years past, and this fuel has come to have a very wide field of commercial application during that time. Nevertheless, there still remains a great deal to be done in this direction, and it is gratifying to note that no time has been lost in taking advantage of the opportunity here once it was presented.

Thus far the tests undertaken have been mainly of a popular nature, their chief object being to demonstrate that the automobile motor, as at present constituted, is capable of being run satisfactorily with fuels other than that for which it was specifically designed. This has been the case particularly with regard to the carbureter, a general impression prevailing that alcohol and gasoline are of such widely differing character that the same apparatus is not capable of handling both. That special apparatus is required in each case, when it is desired to obtain the highest degree of efficiency, goes without saying, but that the present-day motor and carbureter will run satisfactorily on kerosene or alcohol, in addition to gasoline, appears to have been demonstrated very conclusively by the recent test run, the results of which are given elsewhere in this issue. It is to be hoped that the matter will not be dropped at this point, but that further tests and experiments will be carried out.



Success That Awaits the American Automobile. According to the statistics compiled by the Department of Commerce and Labor, the value of the automobiles and parts exported from the United States during the year 1906 amounted to \$4,409,186, a gain of \$1,714,531 over the corresponding total of 1905. This represents an increase of something like sixty per cent., and this becomes 132 per cent. when compared with the total for 1904. These facts are sufficiently startling in themselves and quite in keeping with the rate of growth experienced at home, but they do not mean as much to the American industry as the fact that the total for 1906 fell short by but \$6,582 of equaling the value of the automobiles imported into this country from abroad during the same time. In 1901 there were only 314 automobiles manufactured in this country; during the same year France turned out 23,711, and a large part of them found their way to this country. Ever since then a goodly portion of all the automobiles made in France have eventually come into the possession of American autoists, not to mention those coming from other foreign manufacturers. In other words, Continental manufacturers were doing a large export business in automobiles with this country long before such a thing was thought of here—something that serves to form a basis upon which to make a comparison of the past year's showing as outlined above. Thus, it is not of such great import that the total valuation should reveal this remarkable increase as it is that it brings to light the fact that, for the first time, the American industry is almost on a par in this respect with its foreign competitors. In other words, that it has overcome an almost insuperable handicap in the short space of five years, and by so doing has gained the right to compete on even terms. The success that has greeted American machine tools and similar products in every part of the globe awaits the American automobile, and what the extent of its conquest will be but five years' hence is something that baffles the imagination to conceive.

DETROIT'S SHOW IN PROGRESS.

DETROIT, MICH., Feb. 13.—The most successful automobile show in the history of the trade in this city, if exhibits serve as a criterion, is that which opened at Light Guard Armory Monday evening. While not to be compared to either of the New York shows or the one that was held last week at Chicago, the Detroit exhibition is nevertheless a compact little affair, and many of the best cars of the trade are represented.

Present conditions simply point out the crying need of this great automobile city for a commodious assembly hall. The Light Guard Armory is the only available place at present to hold a show, and the capacity of this is so limited that it can scarcely take care of the needs of the local manufacturers. Indeed, with the press of outside concerns that are bent on showing here, it is impossible for even Detroit factories to show all the standard models, and some even have preferred to convert their retail stores into showrooms. The Ford people have taken no space in the armory, but are holding a private show at the downtown agency but a couple of blocks away. The Car de Luxe is another that was unable to get any space whatever, former patrons having been given first chance.

At that the local show has several attractions that have been sprung here for the first time—runabouts that came to light in the City of the Straits within the past few weeks. Notable among these is the Brush \$500 car, with solid rubber tires, which in design much resembles a light harness wagon, but of course is of much heavier construction. The Kermath Speedway is a new one to be shown here for the first time, and is a high-grade runabout, listing at \$2,000.

In the line of decorations the local show is very modest. Though plain, the entire armory and drill hall floors have been draped and decorated with the colors of the University of Michigan, maize and blue. The signs and displays are almost universal, and of the same colors with, of course, electric light attachments.

NECESSARY CHANGES IN FREE ALCOHOL LAW.

WASHINGTON, D. C., Feb. 11.—With a view to securing President Roosevelt's aid in bringing about certain amendments to the denatured alcohol law, Representatives Marshall and Hill, the authors of several bills on the subject now pending in Congress, recently held a conference with the President. The latter showed himself in sympathy with the demand for some changes in the present law and expressed the hope that Congress would enact the legislation which experience has shown is necessary. The original intention of the free alcohol law was to give the farmers of the country a chance to manufacture alcohol, but under the law and the regulations as they now stand the business is really thrown into the hands of capitalists or persons having ample capital. The Hill and Marshall amendments will enable the farmer, on a capital of a few hundred dollars, to establish his own plant and make alcohol for his own use as well as for sale.

THE KERMATH SPEEDWAY OF DETROIT, MICH.

DETROIT, MICH., Feb. 11.—The Kermath Motor Car Company, of Detroit, is the newest concern to enter the runabout field. The car is a light, high-powered runabout, and is known as the "Kermath Speedway." It was exhibited for the first time this week at the Detroit Show, and has several distinctive features, among which may be mentioned the radiator design, the location of the time gears and commutator, and the method of hanging the engine and transmission. The price of the Kermath is \$2,000.

EXECUTIVE COMMITTEE N. A. A. M. IN SESSION.

During the course of the Chicago show the Executive Committee of the National Association of Automobile Manufacturers held a meeting in the First Regiment Armory. At its close it was announced that the matter of holding a comprehensive test later in the season was deferred until the next meeting.

NOTED FRENCH AUTOIST DEAD.

A cable report from Paris announces the death in that city, at the age of forty-eight, of Léon Emmanuel Serpollet, a pioneer in automobile manufacture, and the best known exponent of steam as applied to automobile construction.

Léon Emmanuel Serpollet was born at Culoz, near the Swiss frontier, on October 4, 1858. College days over, Serpollet gave himself up to the study of mechanical problems, and was the first man in France to build a steam-driven automobile. He established a factory at Paris for the construction of light steamers, and was joined in 1899 by Frank Gardner, an American, the title of the firm being changed to Gardner-Serpollet. A huge business was done, Gardner-Serpollet engines being adopted by many large transportation, tramway and omnibus companies. Three years ago Serpollet brought out a new type of steam automobile, which met with much success. Last year he joined forces with M. Darracq for the construction of steamers on the Serpollet principle at the Darracq factory. A large factory was commenced adjoining the Darracq works at Suresnes, and has only just reached completion. The first series of steamers from these works will make its appearance this year. One of the big schemes of the Darracq-Serpollet combination was to contract, on the expiration of the present lease, for the entire Paris 'bus service, replacing the present horse service by their new vehicles. In the earlier days of French automobiling M. Serpollet was a prominent figure in speed and endurance contests. Three years in succession he won the Nice mile speed championship, and was the holder of the Rothschild Cup. He was a Chevalier of the Legion of Honour. His death at the height of his career comes as a shock to all who knew him, and robs France of one of her most brilliant engineers.

FAMOUS DRIVERS FOR EMPEROR'S CUP.

BERLIN, Feb. 3.—Preparations for the holding of the race for the Emperor's Cup over the Taunus circuit are progressing rapidly. Owing to continued bad weather no decision has been reached as to the widening of the course, the necessity for which has been mentioned in numerous announcements regarding the race. The list of drivers who will participate, so far as is known at present, is as follows: The three Mercedes cars will be handled by Camille Jenatzy, Director Willy Pöge and Otto Salzer, it being probable that Alexander Burton will be nominated as substitute. The Eisenach factory has named Robert Schmidt and Eduard Bauer as its drivers, with J. Simpson as substitute, while the Argus interests have nominated Wilhelm Flohr. The Metallurgique drivers will be F. von Reinhardt, E. Bussing and H. Wilhelm; those of the Pipe, von Hautvast, Baron de Caters and Deplus; the de Dietrich, Duray, Rougier and Gabriel, with Sorel as substitute; and the Bianchi, Tomaselli and Maserati. The single "F. L. A. G." car will be driven by G. B. Raggio, and the Lucia by Guillaume Busson; the Mors will be in charge of Gillet Hourgiere.

The Adler works have taken time by the forelock and have already sent one of their cars over the course. With the exception of the racing seats, it is their standard touring type.

PERHAPS WEIGEL RACER FOR VANDERBILT.

On board the Cunard liner arriving from Liverpool this week was Reginald Lassen, who brought with him a new 40-horsepower English automobile known as the Weigel. Mr. Lassen claims that this machine is a combination of the features of the Renault and the Mercedes. Two Weigel machines have been entered in the French Grand Prix to be run next July. One will be driven by the designer, the other by Lee-Guinness, the famous amateur driver. It is stated that a special Weigel racer will be built for the next big race in America. The Grand Prix Weigel racers, at present under construction, will have eight-cylinder engine, the same four-cylinder group used in the 40-horsepower touring machine being mounted in duplicate.



*AUTO TRAINING
for THE COURT*



WINTER TRANSPORT RIVALS



*A Peerless
WINTER TRY-OUT*



PEERLESS QUARTETTE ON WINTER TRY-OUT.

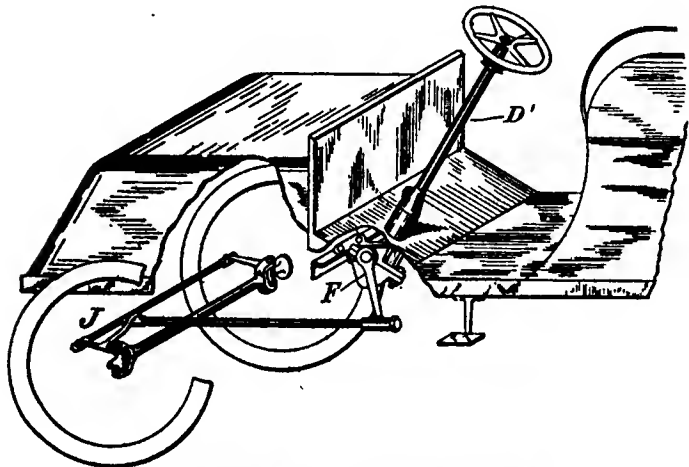
Automobiling is an all-the-year pastime these days, and in consequence there are many winter try-outs of the new models. A car that has attracted much attention at the shows is the 1907 30-35-horsepower Peerless, the designer of which is Charles Schmidt, who came to this country from France in the early days of the industry, being at that time associated with Henry Fournier in Mors interests. Subsequently Schmidt, who rode with Fournier when that driver captured the Paris-Bordeaux and Paris-Berlin races and alternated with him at the wheel in the latter event, constructed the Packard *Gray Wolf* and piloted it over the Florida course to a mark of :46 2-5. At that time this was only two-fifths of a second behind the world's

record held by a car of twice the horsepower of the *Wolf*, which, however, clipped the American straightaway mark of :51 4-5, then possessed by Fournier and a high-powered Mors. It was a case where the pupil had progressed, built and driven a car faster than the master. Some day there may be a Peerless in the Vanderbilt race, and there are those who would like to see what Schmidt can do under present conditions. His success with the 24-horsepower *Gray Wolf* brought him a plentiful supply of fame.

President L. H. Kittredge, of the Peerless Motor Car Company, occupies the seat alongside of the designer, behind him is Sales Manager W. H. Kirkpatrick, and in the other tonneau seat is E. H. Parkhurst, the vice-president and general manager.

STEERING GEAR BASIC PATENT.

Applications for patents are things that lie dormant so long that they are usually forgotten by everyone but the applicant himself. Then the patent issues and the cat is out of the bag. This is a process that has been repeated so frequently in the



DETAILS COVERED BY THE RIKER PATENT.

automobile industry that manufacturers have become familiar with it; so much so that the fact that what is claimed to be a basic patent on steering devices has just been issued to A. L. Riker will probably not occasion the surprise it otherwise might. Mr. Riker made his application for a patent on May 15, 1902, and assigned his rights to the Electric Vehicle Company, Hartford, Conn., to which company the patent issued on January 8, 1907, its number being 840,660. That there is considerable foundation for regarding it as a basic patent will be evident from the fact that its claims cover almost every form of steering mechanism now in general use.

For instance, take the first claim of the patent, which reads as follows: "The combination of a steering pillar or shaft rotatable about its axis to steer a vehicle, a block or interengaging member movable axially thereon and means for guiding said block or interengaging member and preventing rotation thereof, and steering arm or lever attached to the end of said movable block." This is amplified by the next four claims, which it will be seen cover the essentials of the steering gear as now used by practically every car built. They read as follows:

2. "The combination of a steering pillar or shaft rotatable about its axis to steer a vehicle, a block or interengaging member movable axially thereof, connections to prevent rotation thereof, and steering arm or lever attached to the end of said movable block, said lever moving in an arc, and means connecting said lever and block whereby the end of said lever is permitted to move in an arc slightly diverging from the axis of said block while the block moves directly therein."

AUTO MEETS SEVERE WEATHER CONDITIONS.

With the recent snow which has been blanketing New York City streets came the opportunity to prove the superiority of the automobile over the horse for coping with varied weather conditions. While the horses were tugging and slipping, and, in most cases, unable to drag their loads, the automobiles were in evidence and reigning supreme in all sections. None was more wideawake to prove the merits of the automobile than Harry H. Cobe, of the Cobe Automobile Company, New York agents for the Jackson car.

Mr. Cobe, with his four-cylinder 45-horsepower car, equipped with ropes, blankets and sand, drove around the city every day during the icy spell. On the rear of the car he carried a sign, "The Humane Car." With the car he helped the horses that

3. The combination of a steering pillar or shaft rotatable about its axis to steer a vehicle, a block or interengaging member movable axially thereof, a steering arm or lever attached to the end of said movable block, and means coacting with said block to prevent its rotation, interconnection mechanism between the pillar and the steering road-wheels of the vehicle, magnifying the motion transmitted, whereby a limited movement of the rotating shaft causes a sufficient deflecting movement of the road-wheels as and for the purpose described.

4. In combination with a steering pillar or shaft rotating about its axis to steer a vehicle, an interengaging member movable axially thereof, a steering arm or lever and connections between the latter and the axially-moving member, the axis of the said connection substantially intersecting the axis of the rotating shaft, the whole mechanism embodied as a unit of apparatus attachable to and detachable from said vehicle without the disconnection of the component parts.

5. The combination in a steering-pillar for a vehicle, of an independent traverse screw-block with flexible connections at one end and co-operating rotating steering-shaft and oscillating steering arm or lever pivoted to a part integral with the support for said steering-shaft pillar for the purpose described.

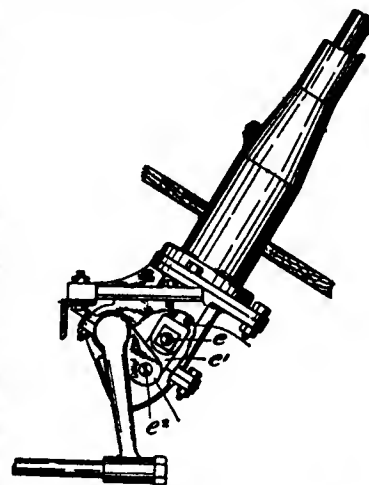
Other claims, the purport of which will be recognized as bearing particularly on devices in general use, are numbers 18, 19, 20, and 27, which, taken in connection with the accompanying drawings, reveal the wide scope of the patent.

"18. In steering mechanism for motor vehicles, a supporting and inclosing casing including means for attachment to the framework or body of the vehicle, said casing embodying a thrust-bearing and shaft-bearing substantially for the purpose described.

"19. In a steering mechanism for motor vehicles, an upright shaft, mechanism at the lower end of said shaft operatively connecting the same with an oscillating member projecting downwardly, a supporting and inclosing casing for the lower end of said shaft, an inlet to said casing from the upper part whereby the same can be used as and constitute an oil reservoir, substantially as and for the purpose described.

"20. In a steering gear for motor vehicles, including a rotating shaft and its operating hand wheel or lever, a rocking lever or arm and connections the deflectable road wheels, intermediate threaded connections for operating the latter by the former, said connections including a tabular casing, an interiorly-close-fitting shell with a threaded portion fixed thereto, and an engaging threaded member within the same whereby said casing, shell, and threaded member co-operate in supporting one another and in transmitting the motion from the hand-wheel to the rocking lever.

"27. In a steering gear for motor vehicles, the combination of interengaging threaded parts, a rocking lever, operative connections thereof of an inclosing and supporting casing comprising a plurality of sections or parts, said section or portions of the casing parted in a manner whereby ready removal or inspection or repair of the bearings of said mechanism is afforded."



SECTIONAL VIEW STEERING COLUMN.

happened to be in trouble—and many there were. One truck that was towed with its load aggregated a weight of about six tons. Another truck was pulled for about twenty blocks before it reached soft snow, where the horse could get a footing.

AUTO TRAINING FOR THE COURT ROOM.

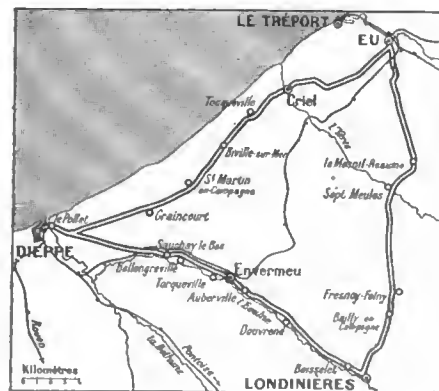
No lawyer has had the strong searchlight of publicity directed at him with greater power in a long time than has Delphin M. Delmas, the advocate from the West who is in charge of the defence of Harry K. Thaw. Believing in the efficacy of plenty of fresh air, Mr. Delmas, in company with Henry McClay Pike, another lawyer of the celebrated case, has been taking a daily ride in a Franklin "air-cooler," supplied through the courtesy of Wyckoff, Church & Partridge.

TWENTY-NINE ENTRIES FOR THE GRAND PRIX

PARIS, Feb. 2.—The Grand Prix of the Automobile Club de France is certain with a total of twenty-nine machines, to furnish a good day's sport, but it will be lamentably lacking in internationality. Twenty-three of the twenty-nine are French racers, two are English, one is Italian, and three are Belgian. The complete list when Secretary Sautin closed his *dossier* last night was as follows:

1. Bayard-Clément (Albert Clément).
2. Bayard-Clément (Garcet).
3. Bayard-Clément (Gauderman).
4. Darracq (Wagner).
5. Darracq (Hanriot).
6. Darracq (Demogeot).
7. Motobloc (————).
8. Motobloc (————).
9. Motobloc (————).
10. Corre (D'Hespel).
11. Panhard & Levassor (Le Blon).
12. Panhard & Levassor (Heath).
13. Panhard & Levassor (Montsava).
14. Renault Frères (Szisz).
15. Renault Frères (Edmond).
16. Renault Frères (Richez).
17. Lorraine-Dietrich (Duray).
18. Lorraine-Dietrich (Rougier).
19. Lorraine-Dietrich (Gabriel).
20. Germain (Perpere).
21. Germain (Roch-Brault Fils).
22. Germain (Degrais).
23. Weigel (Lee-Guinness).
24. Weigel (Weigel).
25. Porthos (————).
26. Marchand (————).
27. Brasier (Bariller).
28. Brasier (Baras).
29. Brasier (Bablot).

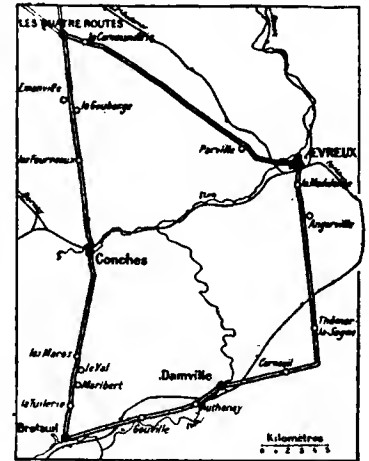
It will be noticed that Mercedes, Fiat, Itala and Rolls-Royce are all absent from the list of engagements. The abstention of the two Italian and the leading German firm is deeply regretted here. Despite C. L. Charley's emphatic declaration of a non-racing policy, it was firmly believed that the Canstatt firm would figure in the great French race, as last year. Fiat and Itala have always displayed such a sporting spirit that their abstention comes as a disagreeable surprise. England has abandoned its boycottage of French races by the engagement of two Weigel machines, Belgium has sent three of her best cars in the Germain, and Italy has a new champion in the solitary Marchand. None of the foreign machines have previously competed in an important road



PROPOSED ROUTE NEAR DIEPPE.

race, and in view of the poor display that has always been made by newcomers in French road races, they are not looked upon as very dangerous competitors. If such an exchange were possible, there is no doubt that the officials of the A. C. F. would barter the whole group for a Mercedes, a Fiat and an Itala. A really international

race had been expected, and not even the big entrance list and the several new firms remove the feeling of disappointment. The newcomers among the French firms are Motobloc, Corre, and Porthos. Motobloc and Corre have a good reputation as builders of touring machines; Porthos, on the other hand, is practically unknown to the French public. There are a number of new drivers; Gauderman, of the Bayard-Clément team, has not previously held the steering wheel of a flyer in a first-rate contest, but he is looked upon as an equal of his companions, Albert Clément and Garcet. As a footballer and all-round athlete he has few equals. A long training at the Bayard-Clément factory has made of him a first-rate mechanic. It is not generally known that Gauderman accompanied Albert Clément, of whom he is a close friend, during his trip to America for the first Vanderbilt Cup contest.



THE EVREUX CANDIDATE.

The Panhard team has been entirely remodeled. George Heath, known here as the gentleman driver, retains his post, and is joined by free lance Le Blon and Montsava, a gentleman driver, who has not previously figured in road racing, and who hides his identity under this *nom de guerre*. The three Belgian drivers to handle the Germain machines have received a thorough training in touring contests. The most sensational entry is that of the young English millionaire brewer, Lee Guinness, as driver of a British-built Weigel racer. Lee Guinness has made himself famous as the owner and driver of the 200-horsepower record-breaking Darracq machine.

M. Brasier, who has entered three machines, says that his 1907 flyers will be very similar to those of last year. They will be rather more powerful, developing 110-horsepower, against 100 last year, will have a number of detail improvements, and will have chain drive.

No definite decision has yet been arrived at regarding a circuit, but the probabilities are that the Seine Inferieure will be selected. Only two candidates now remain out of a first list of at least a dozen, the rivals being the Eure, with Evreux as its chief town, and Seine Inferieure, with Dieppe as headquarters. Both Evreux and Dieppe have offered a subsidy of \$20,000 to the A. C. F., but the promise of the latter is regarded as more important than that of the former, the Seine Inferieure district being one which draws to it thousands of holiday makers every year. Evreux, on the other hand, has no charms beyond its good roads, and, profiting by past experience, the Club is inclined to hesitate at the offer of a big subvention from a poor district. Being on the seashore, Dieppe would receive hundreds of Englishmen for the race, and it is quite natural to expect that numbers of Parisians would choose this seaside resort for their holiday if there was the additional attraction of an automobile race. The Grand Prix must be a paying affair this year, hence the importance of the choice of a course. The total income from the Grand Prix can be estimated at not less than \$75,000. Entrance fees give \$29,000, subsidy \$20,000, and \$26,000 is a very moderate estimate for grand stands, programs, advertising, etc. Last year, with an income of about \$55,000, the A. A. A. realized a profit of \$15,000 on the Vanderbilt contest, which sum is being employed for the benefit of automobiling in general. The French club has never shown a balance and last year had a heavy loss on its race.

THE LITTLE GRAND PRIX IN JEOPARDY.

PARIS, Feb. 2.—Judging from the present conditions of the engagement list, the Sporting Commission Cup, sometimes known as Grand Prix No. 2, will not be a huge success. The race will be run either the day before or the day after the Grand Prix, and on the same course. Regulations are practically the same as for the Grand Prix, except that the fuel allowance will be reduced by one-half—3.3 gallons per 62.1 miles—and that the distance is lowered to about 310 miles. It was thought that under such regulations many firms unable to build special 140-horsepower flyers would make the few necessary alterations and compete with stock touring machines of forty or fifty-horsepower. Up to the present such has not been the case, and of the sixty to ninety machines which the committee counted as certain starters only three have put in an appearance. They are Gillet Forest, driver De la Touloubre; and two Darracq machines, with Wagner and Hanriot as pilots. As for the Grand Prix, there is no weight limit, and instead of stock touring machines stripped of all accessories and provided with more efficient carbureters, the racers will probably be featherweight freaks. Under such conditions everybody knows that the prize will go to a certain world-famed factory on the banks of the Seine. All objections would be removed by imposing a minimum weight, but if this were done now the two manufacturers already engaged would have just cause for complaint. Prompt action will have to be taken if the race is to be saved from complete failure, for the last day on which engagements for the contest will be received is Friday, February 15.

The French press and manufacturers are always unanimous on the need of a minimum weight limit.

FRENCH TOURING CONTEST IS CERTAIN.

PARIS, Feb. 3.—The Marquis de Dion's speed contest for touring automobiles has been received with enthusiasm in auto circles here. Officially the scheme is only in the proposition stage, but its acceptance by the A. C. F. is a foregone conclusion, and details of organization are being arranged. The event will consist of 1,000 miles endurance test in five or six days, and a speed test of 250 miles on a 50-miles circuit near Trouville. For the race a limited consumption of 3.7 gallons per 62.1 miles has been decided upon. A weight limit of 3,527 pounds including four passengers averaging 154 pounds each, will be imposed. Trouville will be chosen as headquarters, the tour starting and ending at this gay watering place during the first week in August. The Trouville circuit consists of 50 miles of the finest roads in France; in the opinion of many it is more suited for a speed contest than the circuits proposed for the Grand Prix. This corner of Normandy is extremely picturesque, the road surface is good, the width is never less than 32 feet, and in many places 60 feet; there are long straight stretches, switchback runs with 10 and 12 per cent. grade; not an important village on the course, and only one turn that cannot be taken at high speed. The co-operation of the press has been obtained in this competition, and every important Paris journal will give a gold medal to be encased in the gold cup offered by the Automobile Club of France. It will be noted that there is much resemblance between the Marquis de Dion's Press Cup race and the Sporting Commission Cup contest. The latter fixes the fuel allowance at 3.3 gallons per 62.1 miles, the former gives 3.7 gallons for the same distance. The eliminating tour and minimum weight limit, however, make the Trouville race impossible for lightweights.

THE COMING HERKOMER COMPETITION IN JUNE

BERLIN, Feb. 4.—Regulations for the Herkomer contest have now been made public and differ slightly from those of the previous years, inasmuch as everything has been done to strengthen the absolutely touring aspect of the competition. The contest is open to all motor vehicles of from 2.5 to 11 liters cylinder capacity privately owned by members of the foreign recognized and German clubs, each car to have at least four comfortable seats, bonnet, mud-guards, three lamps (one in rear), two brakes, exhaust and easy steps. Only petrol of a specific gravity of from 680 upwards may be used; additions of any kind are prohibited. The cars must be driven by amateurs; i.e., members of the above corporations not receiving any kind of recompense. The entry fee is \$90 per car until April 15; after this time until May 15 entries will only be accepted accompanied by double fees. The fees cover the liability, personal injuries, damages and fire insurances. The official program is as follows:

June 4—Examination of cars.

June 5—Dresden, Freiberg, Chemnitz, Zwickau, Leipzig, Naumburg, Weimar, Gotha, Eisenach, 227 miles.

June 6—Eisenach, Meiningen, Kessingen, Schweinfurt, Wuerzburg, Wertheim, Eberbach, Heidelberg, Mannheim, 209 miles.

June 7—Mannheim, Karlsruhe, Aachern, Oppenau, Kniebis, Freudenstadt, Horb, Sielz, Rottweil, Tuttlingen, Lindau, 228 miles.

June 8—Lindau, Weiler, Simmerberg, Immenstadt, Kempten, Fuessen, Weilheim, Starnberg, Forstenried, Munich, 142 miles. Speed trials in the Forstenried Park.

June 9—Exhibition of cars at Munich.

June 10—Munich, Bichel, Kochel, Kesselberg, Walchensee, Mittenwald, Partenkirchen, Oberammergau, Landsberg, Lechfeld, Augsburg, 141 miles. Hill climb on the Kesselberg road.

June 11—Augsburg, Donauwoerth, Noerdlingen, Lohr, Uffenheim, Wuerzburg, Post Rosbrunn, Marktbeidenfeld, Aschaffenburg, Hanau, Frankfurt A. M., 203 miles.

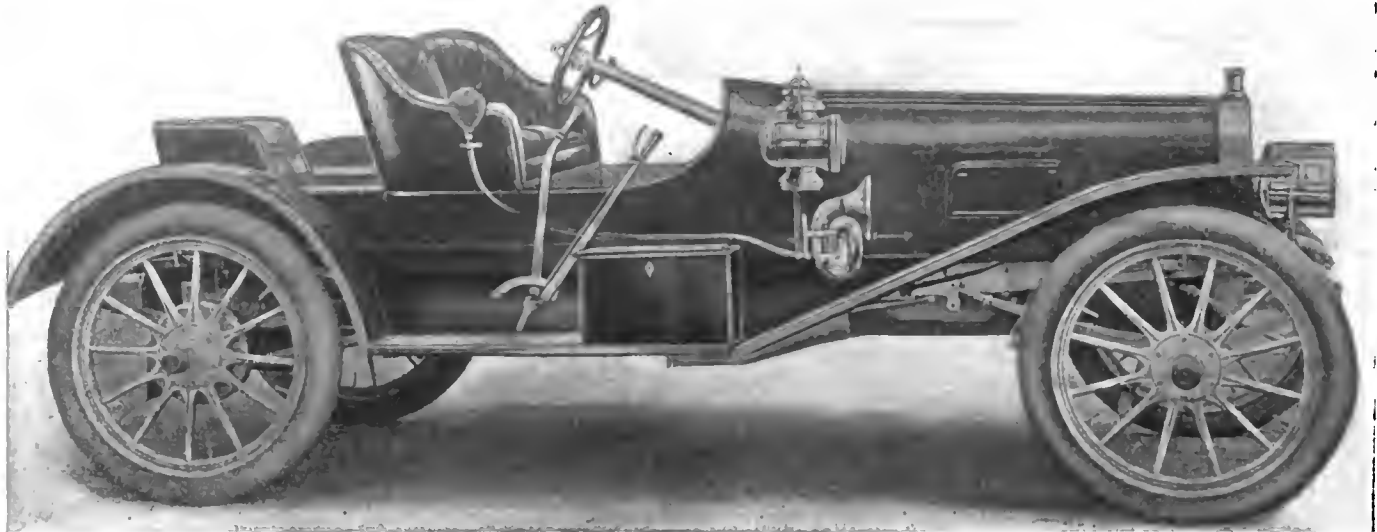
June 12—Prize distribution and banquet at Frankfurt.

At least three adult passengers, including the observer, must be on every car throughout; on the speed and hill tests there must be four, or in lieu of the fourth 70 kilos of ballast. All repairs must be made by the driver and chauffeur, or in lieu of such by a designated passenger. At the various stages the cars will be handed over to the official commissioner, who takes them in charge and only returns them to the observers 45 minutes before the start. These 45 minutes may be utilized for cleaning, oiling, lubricating, filling tanks, etc. The changing of tire covers is excepted.

Awards will be made on the following basis: The victor is the car with the least points. One point will be debited for every commenced minute of involuntary stoppage; five points will be debited for changing and repairing tires, even if done in the 45 minutes before the start. Taking in water after starting time is three points; three will also be given for any repairs which overstep the 45 minutes limit before the start. A late commencement caused by anything else is one point. No points will be given for taking in oil and gasoline at official stations or changing and repairing inner tires. The speed and hill-climb tests will be awarded according to a special table not yet published, but the cars will be debited or credited one-tenth of a point for every commenced percentage faster or slower than the normal speed fixed for each. A car with 50 points has no claim on any award for the speed trials or tests. Should more than one car have the same number of points, the hill-climb and speed trial results will be taken into consideration. Passing will be allowed except in villages and at corners; it is likewise forbidden on the Munich-Kochel stretch and from Starnberg to the speed trials start in the Forstenried Park.

Valuable prizes have been given by the Imperial and Bavarian clubs as well as the cities of Dresden, Leipsic, Munich, Mannheim, etc.

Last year the United States was represented with a Pierce Great Arrow, driven by Percy Pierce. It is hoped that American cars will line up this time also.



HOW THE NEW FORD SIX-CYLINDER, 40-HORSEPOWER RUNABOUT APPEARS ON SIDE VIEW.

FORD BRINGS OUT "SIX-FORTY" RUNABOUT.

Taking advantage of the very general demand that exists for the high-powered runabout at the present time, the makers of the Ford have decided to feature a car of this type in their line for the coming season. The chassis of the six-cylinder Ford lends itself readily to an extremely racy looking runabout body, as will be evident at a glance from the accompanying photograph of the newcomer. The details of the power plant and remaining essentials of the runabout are to be the same as the touring car, with the exception of the wheels, which are 36 inches in diameter, in place of the 34-inch wheels used on the former, and also with the exception of the mudguards, which have been designed especially to blend with the lines of the car. The wheelbase is 120 inches, and, over all, the car measures about thirteen feet.

Its every line is indicative of speed and easy riding qualities, the long bonnet, denoting the six-cylinder motor, being even more accentuated by the recessed dash forming a protective cover for the electrical equipment. A unique feature of the body design of the car is to be found in the combination of the dash and body, the under body extending forward in a straight line from the bottom of the seats, thus protecting the feet and legs of the driver without the necessity of a gate between the front seats and the dash. The seats have been placed so low that the legs of occupants will be almost horizontal. A detachable rumble seat is provided in the rear for the accommodation of a chauffeur or extra passenger, and when not in place a trunk may be carried instead, attachments and straps being provided for that purpose. The equipment throughout is the same as on the touring car, the new runabout listing at \$2,800 in complete running order and ready for the operator.

A TEXAS BUICK AUTO STAGE LINE.]

FORT WORTH, TEX., Feb. 11.—R. L. Slaughter and G. B. Garner, of Midland, have established a route for an automobile line between Big Springs and Lamesa and Lubbock, a distance of approximately 100 miles. They are representatives of the West Texas Auto Company, which owns ten Buick machines and are now making arrangements for starting the line. They will make a contract to run every day in the year except Sundays, rain or shine. In connection with the line they will establish a garage in Big Springs, and will keep a sufficient number of machines in that city to prevent an interruption of the daily service between Big Springs and Lubbock. In making this trip the line will cross five counties in which no railroads are running, being almost a pioneer line of any kind through what is almost exclusively a cattle country.

RULES FOR THE EUROPEAN INVASION.

Detailed rules have now been drawn up for the tour in Europe by American automobile manufacturers with American built machines for the Gold Cup offered by a group of prominent sportsmen. Entries for this event will be received up to May 1, and must be accompanied by at least 25 per cent. of the total fee. Particulars required are make of car, description of model, horsepower, description of body, number of seats, name of driver, passengers, etc. Cars will arrive in New York by May 30, and must be equipped with a reliable speedometer. On arriving at Havre the machines will be weighed with their full quota of passengers, baggage, etc. The frame, cylinders, driving shaft, fly wheel, gear shafts, clutch, crank shaft, radiators, steering post, wheels, axles, springs, etc., will be stamped and the existence of such stamps at the end of the run will be verified. Changes of tires and common repairs will be allowed on the road and in the garages, but penalties will be inflicted for important changes such as the following: Change of frame, cylinder, crank-shaft, front or rear axle, 300 points each; reforging any part of frame, change of driving shaft or clutch, 250 points each; reforging driving shaft, clutch, or axles, changing radiator, 200 points each; change of gear shaft or steering post, 150 points; change of fly wheel, 100 points; change of gear case, 75 points; change of wheels, springs, or crank case, 50 points each. All changes to any of the stamped parts must be reported at the close of the day's run. Any kind of tires may be used, but if spring wheels are employed they must be of American manufacture. According to the speed laws of the country, the nature of the roads and the configuration of the country traversed, a reasonable average speed will be indicated for each day's run. Speeding will not be allowed; any proved cases of excessive speed will be penalized by the jury. Hill climbing and speed tests will be held at the termination of the tour near Liverpool, and the American Gold Cup will remain in the temporary possession of the winner until won in a similar contest by another contestant in a following tour. The exact date of starting from New York has not yet been fixed.

M. MICHELIN ARRIVES IN NEW YORK.

M. Andre Michelin, director of the important French tire manufactory bearing his name, arrived in New York on board *La Savoie* last Saturday. M. Michelin, who is one of the busiest men in the French automobile world, and who has probably played a greater part in the development of the tire industry than any man living, will only stay in this country a few days to supervise Michelin American interests.

EDISON THINKS HIS PLAYTIME IS HERE.

Having fulfilled, less a decade, the Biblical restriction which says that man's life shall consist of three score years and ten, Thomas Alva Edison, the great inventor, is of the opinion that he is entitled to a vacation, and intends to take one. Sunday, February 10, was his 60th anniversary.

"I have been making experiments with electricity for 45 years," said Mr. Edison, "but during that time I have been turning them to commercial use so fast that I have never had a chance just to play with electricity for the fun of the thing, to see how much I can find out about it. It is a pleasure I have long been promising myself, and from to-morrow on I am going to give myself up to it.

"I have been deaf since I was a boy, but my hearing has been getting worse steadily, and it may not be long before it leaves me entirely, so I want to play with my phonograph while I can still hear it. The recently announced invention of submarine sound telegraphy interests me greatly, as does Dr. Cahill's telharmonium, and I may investigate them in my holiday. I am 60 years old, but only 30 in point of enthusiasm.

"My principal work in the last year has been the perfection of my storage battery. Some hundred trucks are using the earlier models in New York, but the batteries did not last as long as I thought they would. About two years was their average life. This would not solve the problem of vehicular transportation in the large cities. A battery of, say, three and a half years' life would.

"I went to work to find out what the trouble was and I found it. I shall let it go out this summer. I believe that this new form of the battery will last seven years. I have batteries now that have lasted in experimental operation between three and four years. When these are in general use in the cities the congestion will be one-quarter as great. The weight is half that of the common battery, with twice the speed.

"I am having a touring automobile built on the lines of the gasoline car, but fitted with one of my batteries. I shall tour over New Jersey in it, and then later visit New England. I can get any speed I want from it, though I shall gear it for about 30 miles an hour. With one charging the battery will take it under the most unfavorable conditions 100 miles, or, under favorable conditions, 125 miles, with four people, at a speed of 30 miles an hour.

"This will practically do away with breakdowns, and will mean that every man can be his own chauffeur. It is very simple, the principal parts being a battery and a motor. A motor needs little attention."

NORTHERN'S PORT HURON BRANCH FINISHED*

PORT HURON, MICH., Feb. 11.—The building of the Port Huron branch of the Northern Automobile Company has been completed, A. J. Smith & Sons, the contractors, having completed the structure, which contains 50,000 feet of floor space and cost \$40,000, in sixty days less than the time allotted. In addition to the main building work will begin immediately on the construction of a big warehouse in connection. As a result of the increased capacity of the plant given by the erection of the local branch in addition to the Detroit plant, the Northern Motor Car Company will make during the season of 1907 about 400 of its two-cylinder, 20-horsepower Northern touring cars.

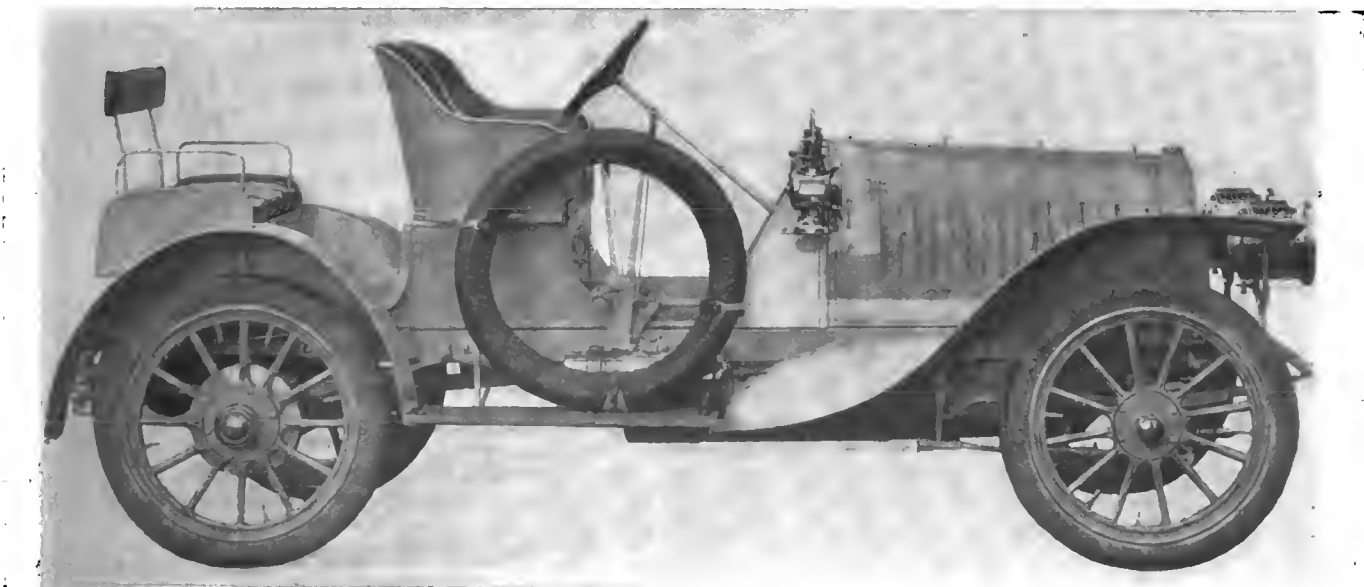
PITTSBURG'S HILLS EASY FOR AUTOS.

PITTSBURG, Feb. 11.—Two weeks of good sleighing on deep snows have taught Pittsburgers that the automobile is a winter as well as a summer mode of conveyance. Instead of high-priced trotters and pacers hitched to sleighs that cost hundreds of dollars as a few years ago, the roads on Sewickley Heights and in the Squirrel Hill district were thickly studded with big autos. The automobiles took the snowy hills in splendid shape as soon as the snow began to pack and automobiling was pronounced "finest ever." Not only the pleasure vehicles, but the big trucks went up many notches in the estimation of the general public, for they acted much better than on the ordinary muddy or slimy streets.

The driver of a 20-horsepower three-ton Knox truck, owned by the National Lead and Oil Company, assisted in easing eight blockades in one day. The Bindley Hardware Company put on a new Logan truck just before the snows came, and it worked so well that the company has since ordered two more.

AN ATTRACTIVE HIGH SPEED CAR.

The new Rainier high-speed runabout, an illustration of which is shown, is an automobile of particularly pleasing external appearance. One of its distinctive features is a rear folding seat for two persons, which, when folded down, gives the car the appearance of a standard turtle back without a rumble seat. Wheelbase is 104 inches, track 54 inches. The engine develops 35 horsepower, the mechanical features being similar to Model C with the exception that the gasoline tank on the runabout is placed under the bonnet instead of under the front seats. The new Rainier type of springs, by which a fastening is obtained without the use of a central bolt, is employed on this model. The rear platform spring is of three-point suspension type.



THE NEW RAINIER HIGH-SPEED RUNABOUT OF 35 HORSEPOWER, WITH GASOLINE TANK UNDER THE BONNET.

TWO OPPOSED BAY STATE BILLS.

BOSTON, Feb. 11.—An example of the extremities in proposed automobile laws with which the Massachusetts legislature has to deal this winter is given in two bills recently introduced in the House of Representatives and sent to the Committee on Roads and Bridges, which has charge of all the automobile bills. One of these bills proposes that hereafter no automobiles shall be licensed which are capable of making more than twenty miles an hour, the legal speed limit. One clause reads: "This act shall not apply to any automobile or motorcycle that could have been legally operated by a resident, as owner, manufacturer or dealer, under any license granted in this commonwealth prior to the time when this act goes into effect. Any person increasing or causing to be increased the speed capacity of an automobile or motorcycle, licensed under this act, above the speed limit set by section one, or any person operating an automobile or motorcycle licensed under the provisions of this act with knowledge that the speed capacity thereof is above such limit, shall be punished by a fine of not more than one hundred dollars or by imprisonment for not more than sixty days."

The other unusual bill has directly the opposite purpose of the foregoing and apparently is intended to make possible such contests on Massachusetts highways as the Vanderbilt Cup race. It reads: "The mayor of a city or the selectmen of a town may, in their discretion, upon special occasions and subject to reasonable conditions, close the public ways and grant permits to persons to operate automobiles at any rate of speed during a specified time and upon specified portions of the public ways."

PROVISIONS OF PROPOSED PENNSY LAW.

PHILADELPHIA, Feb. 11.—Motor patrols and ambulances, and physicians answering emergency calls, are exempted from the speed provisions of a bill introduced in the State Legislature by Representative Woodward, of Allegheny County. All others must observe the following regulations: Where buildings are an average of 100 yards apart, a rate of a mile in four minutes must not be exceeded, and where corners are to be turned or curves to be negotiated, the speed must be reduced to a mile in six minutes. Where buildings are farther apart than 100 yards, the maximum speed allowable is a mile in two minutes, with a slowing down to a mile in four minutes at turns when descending steep hills and when passing other vehicles.

The proposed law further provides for a fine of \$100 or imprisonment for 30 days when an operator is convicted of driving a car while intoxicated; and that it shall be unlawful for a person under 18 years of age to receive an automobile license or drive a car. If passed, the measure will go into effect January 1, 1908.

New Jersey After Non-resident Offenders.

Local automobilists are greatly interested in a bill which has been introduced into the New Jersey Legislature authorizing the issuance of writs of attachment against non-residents of the State in suits for damages. It has been the custom for "foreign" automobilists to get outside the State limits as soon as possible after a mix-up. The proposed bill will permit the immediate issue of a writ of attachment and the holding of the car at the place where the accident or collision occurred, pending the adjustment of the damage claims.

LONG FOREIGN TOUR IN A STODDARD-DAYTON.

What the American automobile is capable of is well demonstrated by the tour of 16,000 miles made by Dr. J. W. White, of the University of Pennsylvania, in a 40-horsepower Stoddard-Dayton. Doctor and Mrs. White returned from Alexandria, Egypt, on the *Cedric*, during the past week, after an extended tour throughout the Continent in their car. Dr. White said that in all that distance they had never been delayed by a serious breakdown.

A REPORT ON AUTO INSURANCE.

ALBANY, N. Y., Feb. 11.—In his annual report to the legislature State Superintendent of Insurance Otto Kelsey thus recommends automobile insurance:

Automobile Insurance.—Inquiries received at the Department indicate a growing demand for protection of this character. It seems to be the desire of some of the insurance underwriters to have the privilege of protecting automobile owners from the following hazards:

- Personal accident to the owner;
- Personal accident to his engineer or any passenger;
- Personal accident to any other person injured by his car;
- Property damage to the car by reason of collision or other accident;
- Property damage to another car or vehicle by reason of collision with car insured.

All of these hazards properly fall under the business of casualty insurance. Personal injury to the owner may now be provided for under subdivision 2 of Section 70; to his employee or any other person under subdivision 3. The various subdivisions of this section, however, do not contemplate assuming a property damage hazard except as property may be damaged incident to burglary plate glass breakage, or by reason of steam boiler explosions. It may be desirable by express provision in the law to recognize damages to property in connection with the running of automobiles. The privilege should certainly be limited to the use of automobiles, and the property damage of the car, or caused by the car to other property, should be distinctly provided for in a new subdivision of section 70.

A NEW YORK AUTO INSURANCE MEASURE.

ALBANY, N. Y., Feb. 11.—Assemblyman Young's bill, amending the insurance law to provide for the organization of companies to insure "against loss of damage to property resulting from accident to a duly licensed automobile, and against loss or damage to property resulting from accident when caused by a duly licensed automobile," has passed the Assembly without objection. It is now in the Senate committee on insurance.

TOLL FOR AUTOS IN NEW YORK STATE?

ALBANY, N. Y., Feb. 12.—At the Monday night session of the legislature, Assemblyman G. H. Whitney, of Saratoga, introduced the following bill to make owners of motor vehicles pay toll wherever there is a toll gate. The bill reads:

An Act to regulate, fix and prescribe tolls for motor vehicles traveling upon toll roads and bridges, where such tolls are not otherwise prescribed by law.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

Section 1. Where a different rate is not otherwise prescribed or permitted by law, any person or corporation maintaining a plank road, turnpike road or bridge, and authorized, or which shall be hereafter authorized, to receive tolls for the passage of vehicles over the same, may charge and receive for each and every motor vehicle propelled by any power other than animal power, passing over the same, a toll rate not greater than the maximum rate allowed by law to be charged and received for the passage of a vehicle drawn over such road or bridge by two or more animals, provided that for such motor vehicles designed to carry only a single person the rate of toll charged or received shall not exceed the maximum rate allowed by law to be charged and received for the passage of a vehicle drawn over such road or bridge, without a load, by a single animal.

Section 2. This act shall take effect immediately.

PITTSBURG HAS A PRACTICAL AUTO SCHOOL.

PITTSBURG, Feb. 11.—A decided feature in the automobile situation in Pittsburg this year is the new Auto Transportation School, at 5906 Penn avenue, East End, one square from the "bunch." When started a few weeks ago many predicted that it would die a quick death. Instead the big building is crowded day and night with learners, both beginners and men and women who have driven their own cars for years. All sorts of information relative to the handling of automobiles and engines of all kinds is imparted and actual practice in driving a car is given the members of the big class.



[UNIVERSITY AUTOMOBILE COMPANY'S GARAGE, NEW HAVEN.

Connecticut's Center of Learning Has New Garage.

A new garage, one of the few specially designed and built for the purpose for which it is being used, has been opened at St. John and Olive streets, New Haven, Conn., by the Universal Automobile Company. The Olive street building measures 45 by 200 feet; St. John street has 35 by 100 feet. The garage is fitted throughout in first-class style, complete with machine shop, vulcanizing plant, hot water heating, ladies' room, private lockers, and has accommodation for 200 cars. In addition to holding agencies for several well-known automobiles, the company builds the Continental car in two models: a 30-horsepower shaft-driven runabout and a 40-horsepower touring car.

New Type of Garage and Salesroom at Louisville.

Easy entrance and exit is an original and valuable feature of the new automobile garage built by Longest Brothers Company, Inc., of Louisville, Ky. As will be seen from the engraving, the showroom occupies the center portion of the building, with a doorway on each side. Entering or leaving the garage, usually a matter requiring a certain amount of skill, is in this case a very simple affair, for there is no danger of suddenly finding the passage obstructed by a car coming in the opposite direction. The Longest Brothers' garage has 70 feet frontage and is 200 feet deep. The front building is used entirely as showrooms and office, behind this being the garage. On the second floor is an equally roomy repair shop.

Increased Facilities for Leading Toledo Garage.

The Rivers-Jacoby Automobile Company, of Toledo, O., has just increased its capitalization for the purpose of increasing its business. The company has been operating a garage on Monroe street, and it is the purpose to erect a large addition to its building and install a modern automobile repair shop. Those interested in the concern are A. D. Rivers, W. E. Jacoby, A. F. Nicklett, C. G. Smith and E. E. Davis.

Free Garage for a New York Theater's Patrons.

The Majestic Theater, of New York City, which is located in the heart of the automobile trade district, has made a bid for popularity by offering free garage accommodations during the continuance of the play to patrons desiring to make the trips to and from the theater in their automobiles. A neighboring garage has been engaged by the theater management to take care of the cars while the play is on.

Toronto's Big Garage in Course of Construction.

Canada will have its finest automobile garage in the new building being erected for Hyslop Brothers at the corner of Shuter

and Victoria streets, Toronto. The new structure will have three stories 100 by 100 feet, of fireproof cement, fitted with elevators and every convenience. The cost will be \$100,000.

Upper Ohio Valley Has a Fireproof Garage.

A garage to accommodate twelve large cars has just been completed in East Liverpool which will be under the direction of H. H. Knowles. It is planned to keep a complete outfit of supplies on hand continually. The garage is fireproof, the only one of its character in the upper Ohio Valley.

GLEANED AMONG THE GARAGES

The first automobile garage in Cheyenne, Wyo., has been opened by Wright & Lawson, at 1719 Capitol avenue.

There will be an automobile garage in connection with the new Harvey House, at present under construction, at Hutchinson, Kan.

A new fireproof garage will be erected shortly at First and Adams streets, Marion, Ind., to replace the one burned down recently.

Millward & Cook have succeeded the Palace Automobile and Machine Company in the garage business at 208-214 West 124th street, New York City, at Seventh avenue drive.

About March 1 the new garage of the Woodstock Auto Company, at 1943 North Woodstock street, Philadelphia, will be completed. There will be accommodation for 200 cars.

A fine, large garage is soon to be built in Waterbury, Vt., by W. F. Davis, proprietor of Waterbury Inn. The building will be completed in time for the opening of the automobile season.

A lease has been secured by the Rockford (Ill.) Engineering Company of the new Cutler building, in that city, and it will be fitted as a modern garage and be opened about May 1 for service.

The Imperial Motor Company, of Buffalo, N. Y., has filed plans in the bureau of building for the construction of a two-story brick store and garage to be erected at 1094 Main street at a cost of \$30,000.

The southeast corner of One Hundred and First street and Broadway has been leased to the Bloomfields Leasing Company, which will erect stores and offices on the Broadway front and a fireproof garage on the rest of the plot.

The proposal to have a municipal garage for the City of New York under the Brooklyn Bridge, at the Brooklyn end, has been filed for future reference. The mayor says that such a location would not be convenient for all sections of the municipality.



LOUISVILLE'S LATEST APPROVED TYPE OF GARAGE.

Pitman-Nelson Auto Company has purchased the garage at 2608 Shattuck avenue, Berkeley, Cal., to be known in future as the Shattuck Avenue Garage. Another garage belonging to the same company is located at Addison street, a little below Shattuck avenue, that city.

Plans have been prepared for a garage 52 feet by 200 feet, to be located on Jefferson avenue, between Antoine and Hastings streets, Detroit, Mich. The new concern will be known as the Fee-Vincent Electric Car Company, and will handle electric vehicles only. The Woods electric agency has been secured.

The Winton Motor Carriage Company has let the contract to Gailey & Chambers for its \$30,000 garage to be built in Beatty street, East End, Pittsburg, Pa., one square from the "Bunch." This is on a leased site adjoining the Winton garage, which was burned a few weeks ago.

Arthur Gardiner, well known in automobiling as the result of his Rambler connections, is building a new garage at Kenosha, Wis., which will be opened in the near future. Kenosha is on the direct line between Chicago and Milwaukee, and a garage in that city will be a great convenience to tourists. Mr. Gardiner will also be remembered as one of the old-time champions of cycling.

The Standard Automobile Company, of Pittsburg, Pa., has leased from Nicola & Shenk one-half of the first floor of the new Century Building, in Seventh street near Penn avenue, for a downtown garage. The building is a twelve-story reinforced concrete structure, the highest of its kind in the city. It gets one of the most central locations downtown, and the quarters will be finished and fitted up to its order. This lease is significant, as it makes five big East End firms which now have downtown garages, the others being the Banker Brothers Company, which lately leased a big room in Diamond street; the Keystone Automobile Company, which occupies a large space on the first floor of the Fulton skyscraper; the D. P. Collins Company, in Seventh avenue, and E. D. Nevin, with the Darracq agency at 507 Wood street.

MR. WINKLEY ON TRADE PUBLICATIONS.

At the monthly meeting and dinner of the New York Advertising League held at the rooms of the Aldine Association, January 29, Robert L. Winkley, manager of the department of publicity of the Pope Manufacturing Company, spoke on "The Ethics of Advertising," and said in part:

The trade paper proposition, too, has received its share of discussion. Personally, again, I am very strong in favor of a liberal use of space in these mediums. The traveling salesman and dealers throughout the country are constant readers of trade papers that draw from them an inspiration which comes in like form from no other source. Their use brings the manufacturer close to the selling end of the business and he gets the benefit of that "word of mouth" publicity—one of the most valuable kind of advertising. I don't mean by this that trade papers are lacking in those elements we look for in publications of general circulation, but I would emphasize this point as of importance in the consideration of the subject: There are four specific view points—that of the maker, the seller, the publisher and the user, and the ethics of each should be studied, determined and carefully observed. The maker who forges to the front and accomplishes something for the best interests of the industry is entitled to have the columns of the papers open to the news items in connection with his work, and I find the editors as a rule ready and willing to co-operate in spreading abroad the description of new and valuable inventions which are of interest to the public.

ACTIVITIES OF THE A. C. OF BUFFALO.

BUFFALO, Feb. 11.—Owing to much annoyance local automobilists are having from automobile thieves, the Automobile Club of Buffalo has decided to offer a reward of \$50 for the arrest and conviction of any person stealing an automobile which is the property of a member of the club.

The Automobile Club has appointed a committee of three, composed of President Seymour P. White, Treasurer John M. Satterfield and Director Charles Clifton to undertake the preliminary investigations for the proposed boulevard from Buffalo to Niagara Falls.

AN ENTHUSIASTIC AUTO FAMILY.

George J. Grossman, president of the United States Title Guaranty & Indemnity Company, No. 160 Broadway, New York City, has tendered his resignation, and in the immediate future will become identified with the automobile industry in company with his two sons, Mortimer M. and Wallace G. Grossman, to whom it is said he has given \$100,000 to carry on experimental and manufacturing work in automobiles.

"Yes, I think we are automobile cranks," says Mr. Grossman, "and I hope and believe that my boys will turn out the perfect car of the future, which will be an electric. We propose erecting a mammoth garage and experimental station at White Plains, N. Y., which will cover a city block and a half, will have the largest concrete span in the world, and I think will also be the largest garage ever built."

A TEST OF THE MIDGLEY TREAD.

Hiram Percy Maxim, chief engineer of the Electric Vehicle Company, Hartford, Conn., has just made an especially severe test of the Midgley Tread, which the Hartford Rubber Works Company has recently brought out to solve the side slip problem on their Dunlop and Clincher type tires. He drove a 24-horsepower Columbia, a touring car, carrying three people, up Church street hill, Hartford, a 22 per cent. grade, eight inches deep with snow, while the ground underneath was covered with ice from a recent thaw. This hill is so bad that it is seldom used by any form of vehicle, even in summer. Two 32x4 rear tires with the Midgley Tread was the equipment, regular smooth tires being used in front.

Not only was there no tendency to slip, but Mr. Maxim was able to stop in the middle of the hill and "pick up" again from a stand-still. He adds, "I consider this a very severe test on any kind of tire, and it shows the great advantage of a lot of little points, rather than a few large ones." As a matter of fact there are always not less than 200 separate and distinct points in contact with the road surface at one time; and in an average-size Dunlop tire with Midgley Tread there are 3,344 points which grip the ground during one revolution of a wheel.



TESTING THE MIDGLEY TREAD AT HARTFORD.

NEWS AND TRADE MISCELLANY.

Owing to its inability to have the name "Keystone" registered, the Penn Petroleum Company, of Philadelphia, has changed the name of its Keystone motor oils to Primus motor oils.

The Pope Motor Car Company, of Toledo, O., has advised the Hartford Suspension Company, of New York, that it is receiving a large number of orders for the Hartford shock absorber to be equipped on cars when shipped from the factory.

An error as to tire dimensions crept into the Morgan & Wright advertisement in the January 24 issue of THE AUTOMOBILE, making what should have been "30 x 3 1-2-inch" read "30 x 30 1-2-inch." As Mr. Hubbs, of the big Detroit company states: "We have not yet begun the manufacture of tires of this size."

The Reo Motor Car Company's Cleveland branch has been awarded a contract by the city of Cleveland for a runabout for the park engineer. This is the sixth Reo runabout now owned by the city of Cleveland, and in constant service by the municipal department heads. It is claimed that in every case the Reo company's bid was the full price of the car.

Holley Brothers Company, Detroit, Mich., the well-known carburetor manufacturing house, has closed a contract with Alexander Winton whereby it secures the exclusive right to manufacture for the general trade the new carburetor which made its appearance last fall on the Winton Model M and Type X-I-V. This carburetor has no auxiliary air inlet, and has demonstrated itself to be a highly satisfactory producer of gas.

The three-ton Reliance truck that made the recent trip from Detroit to Chicago was equipped with genuine Firestone side-wire motor tires, and much of the success of the trip, which was undoubtedly the longest officially recorded trip made by a commercial car in this country, was due to the "stick to business" qualities of the Firestones. At the finish of the journey the tires were in excellent condition, despite the rough, frozen roads and general hard usage.

The Rauch & Lang Carriage Company, of Cleveland, which for the past three years has been engaged in the manufacture of electric automobiles, has increased its capital stock from \$75,000 to \$250,000. A large addition to its manufacturing establishment will be erected, and the company hopes to complete it in time to take care of the demand next spring. C. L. F. Wieber, a prominent Cleveland merchant, has become identified with the company, and Harry N. Ravenscroft, associated with Mr. Wieber, will enter the sales department.

The Mitchell Motor Car Company, of Racine, Wis., has received a cablegram from its Paris agent, C. N. Sauerbach, urgently requesting delivery of sixty additional cars for the coming season, which is strongly indicative of the advance American machines are making abroad. M. Sauerbach's contract this year is for forty cars, and early last fall he secured an option on 200 Mitchells for 1908 delivery. The Mitchell people are making three models this year, a \$1,000 runabout, a \$2,000 touring car, and a \$2,000 truck. As soon as the frost is

out of the ground operations will be begun on further additions to the plant, which will enable an increase in the output to 2,500 cars annually.

Dr. E. G. Reinert, of Hartford, Conn., who owns a Mark XII Columbia electric runabout, was much in evidence during the recent heavy storm attending to his patients. The doctor up to the present time, according to his Veeder cyclo-meter, has driven his little electric 70,000 miles, the period of service extending back some seven years, when motor cars were few and far between. The doctor was one of the first to own a car in Hartford. He never makes use of any sort of chain grip, and has experienced but little tire trouble.

The Fellwock Automobile & Manufacturing Company has been organized in Evansville, Ind. Incorporation papers showing a capital stock of \$30,000 have been filed, and the company is ready for manufacturing. Those interested are W. E. Fellwock, president; J. F. Fellwock, vice-president, and P. B. Fellwock, secretary and treasurer. It is stated that the company will have the agency for the Maxwell, the Stoddard-Dayton and the Baker electric cars, in addition to the extensive manufacturing it will conduct. A tonneau, or surrey seat, to sell at \$50, and made to fit many of the standard runabouts, will be made. It will be furnished complete with steps, hook, rubber mat and tip, and it is asserted that it can be set on and securely fastened in thirty seconds. Turntables, tops and shields will be made. One of the principal top models is a detachable top to fit the Maxwell runabout. It is upholstered in cloth, has French bevel plates, is made from sound lumber and genuine leather. It will sell for \$200. The front and rear glasses are hinged at the top, and can be swung up at will.

NEW AGENCIES ESTABLISHED.

J. L. B. Wilhide, 2329 Madison avenue, Baltimore, has been appointed agent for the Atlas commercial cars in that city, by the Knox Motor Truck Company, of Springfield, Mass.

The Stearns car will be handled at Los Angeles, Cal., by A. H. Braley, 400 South Spring street. The good hill-climbing qualities of the Stearns have made it a popular seller on the Pacific coast.

The Winton Motor Carriage Company announces that its new branch, about to be established in Detroit, is to be in the nature of a surprise to that city of automobiles. The interests of Frank Smith, the former representative, have been purchased, and his establishment at 248 Jefferson avenue will be continued until a suitable site for the erection of a modern salesroom and garage can be found. The new branch will be under the management of Thomas W. Henderson, son of the vice-president of the company.

The Consolidated Wagon & Machine Company, of Salt Lake City, Utah, Geo. T. Odell, general manager, has taken the agency for the Knox waterless pleasure and commercial vehicles for the states of Utah and Idaho. The Myronda Motor Car Company, 1012 North Grand avenue, St. Louis, has taken the agency

for St. Louis and the adjoining counties in Illinois and Missouri; the Kentucky Automobile Company, of Louisville, Ky., for the State of Kentucky; A. A. Irion, Jr., for Waterbury, Conn., and vicinity.

Two new firms handling foreign cars have recently been added to Philadelphia's automobile colony, Louis I. Matthews and T. Hollingsworth Andrews, Jr., under the firm name of Matthews & Andrews, handling the Renault, Panhard, and Delaunay, in the Harrison building, and William E. Walter, representing the English Daimler, at 710-11 Girard building. Another foreign car to secure representation in the Quaker City during the past week was the Clément-Bayard, for which the Stehle Company, 205 North Broad street, and which also handles the York Pullman, has secured the local agency.

PERSONAL TRADE MENTION.

R. L. Kingston has just relinquished his connection with the Harburg Tire Company, of New York City. Frank G. Hill has been appointed the new sales manager.

Albert C. Galbraith has joined the selling forces of the International Rubber Company, of Milltown, N. J., and will travel in Pennsylvania, Maryland, Delaware, and Virginia.

A. S. LeVino announces his resignation as sales manager of the Ajax-Grieb Rubber Company, same to take effect this week. It is understood that Mr. LeVino is to become connected with a well-known automobile manufacturing company.

C. W. Kelsey, who has resigned as Eastern sales manager of the Maxwell-Briscoe Motor Company, states that his new connection will be announced in the near future. Mr. Kelsey recently visited the other side, and it is understood that his new position will be related to a foreign make.

C. E. Denzer, who has been for five years connected with The White Company, has been placed in charge of the White branch in Chicago, taking the place of Webb Jay, who is no longer connected with the organization. As announced some months ago, the Chicago office will be under the general supervision of C. A. Hawkins, Western sales manager of The White Company.

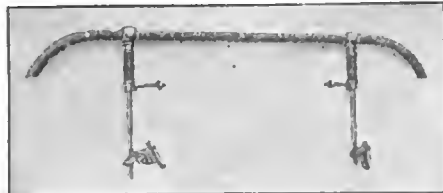
Recently it was erroneously stated in these columns, through information from an apparently unreliable source, that C. J. Metzger had resigned as sales manager of the Woods Motor Vehicle Company. Mr. Metzger gave public denial to the story by figuring as one of the most indefatigable workers of the Chicago show, it being said that as a result of his labors a substantial number of Woods orders had been booked.

AFTER A DEALER IN EVERY CITY.

A. H. Funke, of 83 Chambers street, New York, has been appointed sole agent for the United States for S. Smith & Son, of London, England, whose speedometer is widely and favorably known throughout Europe. Mr. Funke has a special proposition to make to the trade, and desires to hear from one good dealer in every city.

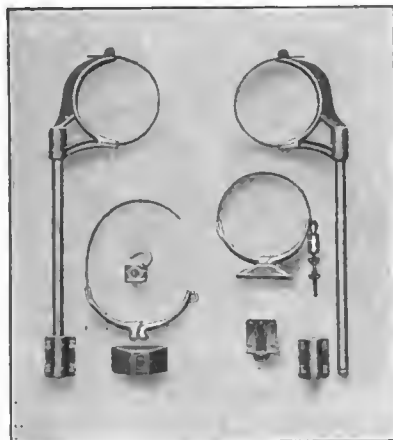
INFORMATION FOR AUTO USERS.

Useful Auto Appliances.—The Appliance Manufacturing Company, of West Jackson Boulevard, Chicago, has produced quite a number of useful fittings for the automobile. Their Amco fender is a new device, which, when attached to the automobile, effectively protects the lamps and radiator from injury arising from accidental collision with obstructions. It is substantially made of a heavy front tube, steel side rods, and



THE AMCO AUTOMOBILE FENDER.

solid brass hangers and guides and steel-coiled springs. Side blows, much more frequent in dense traffic than end-on blows, are equally well provided against by this apparatus. The fender is adjustable to fit any automobile. It is made in two finishes, the standard type, with black enameled front bar, polished brass tips, brackets and guides, listing at \$20; and a special finish, smooth, ready for painters, with brass parts polished, selling at \$18. The Amco extra tire holders are made in various symmetrical designs for holding either one or two tires. Lightness and strength have been combined, and security is assured by a Yale lock. There are no set-screw heads to tear



IMPROVED AMCO TIRE HOLDERS.

clothing, and a valuable feature of the holders is the ease with which they can be removed when not in use, without the aid of any tool. The Amco long-distance horn is another new appliance. It is blown from the exhaust of the engine, has a revolving reed, gives an unmistakable warning note and will not clog or get out of order.

Luverne Solid Tire Wheels.—The usual procedure when an automobile owner decides to change from pneumatic to solid tires is to fit the solid tires on his old rims so as to save the trouble and expense of making any change on same. When he gets these solid tires on his rims they will be so fixed that he cannot use his pneumatic tires any more, and his solid tires are considerably less in diameter than the pneumatics were. Be-

ing small they ride hard, and, in addition, are more apt to skid. The method of the Luverne Automobile Company is to furnish a new set of wheels with Firestone side wire, solid tires attached. These wheels are made to fit customers' hubs, and as all artillery wheels are so made that the hubs can be taken out without damaging the wheels, it is possible to keep the old wheels, with pneumatic tires, in reserve to be used again if desired. The solid-tired wheels are made somewhat larger in diameter than the pneumatic-tired wheels. Thus 30 inches outside diameter would be increased to 31 or 32 inches, it being important with solid-tire wheels to use as large diameters as possible up to a certain point.

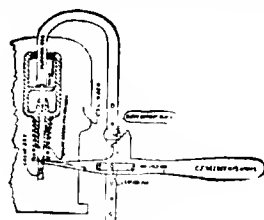
Grinding and Buffing Motors.—The Lamb Electric Company, of 32 Canal street, Grand Rapids, Mich., has placed on the market a direct current grinding and buffing motor for jewelers, silversmiths and metal workers. Some of its



DIRECT-CURRENT BUFFING MACHINE.

features are great torque or pulling power, smooth running obtained through perfect balancing and extra long and large bearings, brushes are of carbon and easily accessible, commutators are of copper thoroughly insulated with mica, armatures are the slotted type, with the conductors carefully embedded in the slots, field magnets are one-piece castings of high permeability, and field and armature coils are wound with the best magnet wire. The motors vary in size from 1-4 to 2-horsepower, their price being from \$50 to \$130. With each motor is included a snap switch, 10 feet flexible cord and an attachment plug with the 1-4-horsepower size. Starting boxes are furnished with the larger sizes, instead of snap switch cord and plug. Emery wheel can also be added as an extra.

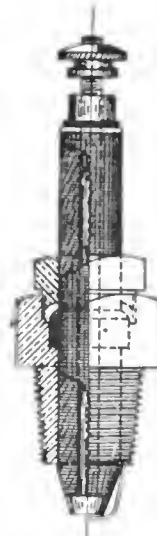
Weeber Valve Tool.—As its name implies, the Weeber Valve tool, manufactured by the C. F. Weeber Manufacturing Company, Albany, N. Y., is designed to



TOOL FOR VALVE REMOVAL.

quickly remove valves from gasoline motors. In addition it is a very handy tool to aid in removing and placing tires and side rings, or compressing things where clamps are needed, thereby making it a very useful instrument for the auto kit or shop use. The selling price is \$2.50.

A Self-Cleaning Plug.—The entirely original feature of the Holsten spark plug, manufactured by the Triumph Engineering Company, 226-230 Lafayette street, New York, is that it is self-clean-



SECTIONAL VIEW OF HOLSTEN PLUG.

ing. The central pin or electrode is surrounded by a composition inside of the mica washers, giving superior insulation. The formation of any carbon on the sparking points is prevented by the valve movement of the insulating section. This movement is very slight, less than 1-32 of an inch, but sufficient to accomplish its purpose and keep the sparking points clean. It combines in a measure the advantages of the make-and-break system with the jump spark. At the time of the explosion the valve is tight, but it drops back on the down stroke of the piston far enough to make the electrodes touch, and keep them clean. As a proof of their confidence in the value of the plug the manufacturers give a five-years' guarantee.

Radium Polish is one of those little things necessary to the chauffeur who takes any interest in the condition of his brass work. It will produce a quick, easy polish on all kinds of metal, and is guaranteed not to scratch the finest surface. It is handily put up in the form of a round bar and does not spill or waste in use. Retail selling price is 10 cents, with a special discount to dealers and jobbers.

Aluminum Bodies.—As an example of the various types of aluminum bodies produced by them, J. M. Quinby & Company, of Newark, N. J., have produced an illustrated catalogue showing limousines, coupés, landaulets, double phaeton and runabout bodies, in their finished colorings. The firm announces that it has completed the extensive additions to its plant, and is now installing a complete repair shop for overhauling high-grade chassis. A number of machines are carried in stock, including Renault, F. I. A. T., Panhard, and Simplex, fitted with Quinby aluminum bodies.

THE AUTOMOBILE



THE dream of all automobilists is to make the tour of the Loire Chateaux. The Loire country is the touring ground *par excellence* for automobilists, and the wealth of romance and history still radiates from its old chateaux with a medieval splendor that is yet undimmed by the rush of twentieth century progress, and will remain so for many a day

The automobilist from over-seas, en tour in France, is still—for some inexplicable reason—drawn Parisward, there to fool away a good bit of time which might be better spent in pleasurable and profitable travel. It may be that the tourist thinks his automobile needs a course of Paris doctoring—or his chauffeur does his best to make him think so—but there are far better *mécaniciens* in the great provincial towns like Rouen, Evreux or Chartres, and they are not nearly so likely to put sand in your gear-box or detach your ground wire, and spend two days hunting for the connection at your expense. Besides this, their prices are cheaper for what is really required, and your chauffeur has no likely chance of being able to pull in a rake-off as is his due by the unwritten law of the Avenue de la Grande Armée. As for yourself, you will be saved the *ennui* of hanging around Paris in the interval, and eating the same sort of table d'hôte dinners that you would in New York, London or Vienna, killing time at Henry's with cocktails at a franc apiece, or indulging in similar pastimes.

Avoid Paris, then, en route from your port of debarkation, if at all possible, and leave your automobile at Evreux or Chartres and go into town by train, if you must, in eighty minutes and avoid the deadly kilometers of Louis Quatorze *pavé* which surround Paris in every direction. Garage accommodation is cheap in the provinces; most likely you will pay but a franc a day until you come back and take to the road again. There is but one decent route in and out of Paris in any direction, and the writer in half a dozen years has never found it but once; for this reason he can give no directions which will prove definitely satisfactory except to avoid Paris altogether.

When the Autoist Arrives in France.

One disembarks his machine at Cherbourg or Le Havre, most likely, unless by chance he has been touring in England, when perhaps, he will arrive in France via Dieppe, which to all intents and purposes is practically the same thing so far as the present

outline itinerary is concerned. If he enters via old Boulogne-sur-Mer he must still skirt Paris to the west in order to most comfortably arrive in Touraine. In any case the route to Touraine and the chateaux country is easily traced to avoid Paris, and, indeed, is much shorter than if one doubles in and out of the capital.

From Le Havre or Dieppe, via Rouen to Chartres, or if one is a pusher, to Orleans is about all one will want to tackle in a day; in fact, it is a good deal more than will prob-

ably be accomplished the first day, in spite of the fact that the distance is only about two hundred kilometers in either case, say a hundred and twenty-five miles.

You Must First Get "Les Papiers."

If you are a stranger-automobilist in France you will have to waste half a day, or perhaps more, of valuable time in Rouen fixing up your *Certificat de Capacité* and your *Récépissé de Déclaration*, without which you may not run an automobile on the roads of France—at least so reads the law. There are many who ignore this and do actually tour France without *les papiers*, but a devoted gendarme will sooner or later catch them up and then there will be something to pay, and as like as not the auto itself will be impounded, awaiting for the law machinery to revolve. The formalities cost nothing, and it will be much better business to attend to the matter at once.

Leaving Rouen via Evreux or Vernon, one gets main roads only all the way to Touraine. By the latter route one descends the famous Côte de Gaillon just before reaching Vernon. It is



nothing so terrible as a hill; it only averages 10 per cent. grade; but it gives a straightway hill-climb for a kilometer with no turns or bends, and stopping off if you a hill-climbing contest.

Dreux, a hundred kilometers from Rouen, is a good place to take your déjeuner (Hotel de France), and you may buy *essence* and *huile* (gasoline and oil), at the hotel before you leave, at the same price you would pay for it in the town.

Chartres for the night, or for déjeuner or dinner for that matter, is a very good thing indeed; incidentally you may see the finest and rarest thirteenth-century colored glass extant, and the most graceful and ornate church-spire in the world at the cathedral. To be well and satisfactorily cared for at Chartres one must stop at the Hotel Duc de Chartres. It is nothing luxurious, and is very homely, but the food is excellently well cooked and served, which is more than it is at the Grand Monarque on the other side of the Grand Place, though the latter establishment has more up-to-date garage accommodations. *Verb. Sap.*: Send your chauffeur and your automobile to the Grand Monarque, even if it is the "swell" hotel of the place, and sit tight yourself at the Duc de Chartres—the hotel with the great white automobile hanging out over its door.

If You Come from Paris.

Coming out from Paris—if you insist on taking your automobile there—the best entrée to the Loire region is via Versailles, Rambouillet and Chartres. This is a much better road, and much more interesting to cover, than the "Route d'Orleans" direct, and it is only a trifle longer. After Chartres the great plain of La Beauce is crossed. This is the granary of France, and, if American automobiles are not yet seen in these parts in great numbers, American agricultural machines of every kind are; they are everywhere.

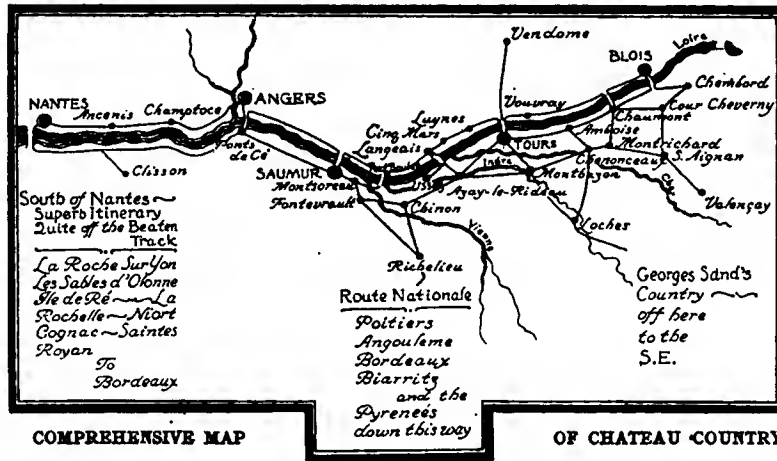
To Orleans direct from Chartres is but 78 kilometers—via Artenay, and to Blois—via Bonneval (where it is market-day three days a week: 'Warc loose chickens, ducks and sheep), and Chateaudun (where there are a lot of vile cobble-stoned streets), is something like 140 kilometers, a little short of a hundred miles.

Orleans Uninteresting Despite Jeanne d'Arc.

One ought to go to Orleans; at least one will want to go there; but without prejudice, it's the most uninteresting city of its class in all the wide land of France. It has some "sights," to be sure; a great cathedral, the storied memories of Jeanne d'Arc and some modern and not very good monuments to "The Maid," the house once habited by Agnes Sorel, and a blending of old and new that is astonishing if distressing.

The hotels of Orleans are good. The Hotel Moderne is very modern, with *art nouveau* swirls and blobs over everything from the menu-cards to the chair-backs, while the proud old Hotel St. Aignan is trying hard to keep pace with its younger rival. Accommodation for man and his modern beast—the automobile—are very good at either, and prices are about the same, say twelve francs a day for everything.

One advantage of striking in on the Loire at Orleans is in being able to follow down the right bank to Blois, and the passing through



COMPREHENSIVE MAP

OF CHATEAU COUNTRY

and stopping off if you will at one or more of those sleepy old-world towns of the Orléanais, such as St. Ay, Cléry, and Beaugency. You really should stop at Beaugency to get a nearby view of the old donjon where Francois Villon, a vagabond traveler himself, though he was a criminal, was imprisoned by the Bishops of Orleans. It was here the writer got a marvelous déjeuner one dripping wet day when his

machine positively refused to go any farther (water in the carburetor was the cause), and he confidently recommends Beaugency's Hotel de l'Ecu de Bretagne to any who want to get next to the soil. It cost a half a dollar *tout compris*, and was cheap at the price, with wine thrown in of a brand which would sell for a dollar a bottle on Broadway. This is one of the real country hotels where wine comes as a matter of course, as much as you like to drink—*à discretion* is the way the Frenchman puts it, but no one ever heard of a French country boniface cutting off his guests' wine supply, even if he had started on his third bottle.

Meung-sur-Loire follows close. It was here that Dumas laid the opening lines of his D'Artagnan romances—at the Franc-Meurier, but there is no such named inn there to-day.

Blois Can Be Seen Ten Kilometers Away.

As one draws up on Blois he sees, for ten kilometers away at least, the lone tower of its cathedral rising high above the surrounding plain. Blois is the first of the chateau towns, and is itself a great, big, overgrown burg, which, on market-day, is as redolent of butter and eggs and hens and chickens as a town of 1,500 inhabitants far from a great city.

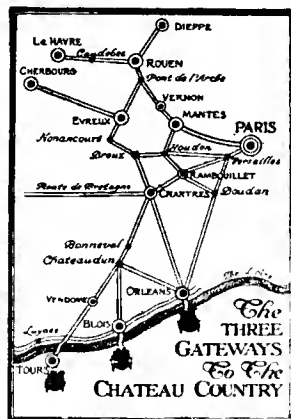
One should make Blois his headquarters for a day or two, or even three. First there is the great state chateau of the Counts of Blois, of François Premier, of Louis XIII, and of Gaston of Orleans, whose artistic taste—or that of his advisors—fell far below that of his predecessors. The chateau is magnificent, and its legend and history, as purveyed by the guide-books, is most complete.

Chateaux Reached from Blois.

After "doing" the Chateau de Blois there is the great, bare, pompous Chambord, a dozen or fifteen kilometers only away across the sandy Sologne plain. It is quite the most surprising, and, in some ways, the most splendid of all the Loire chateaux, and all this in spite of the fact that it has been denuded to the mere skeleton and has no fittings or furnishings, depending entirely upon its architectural graces for its charm.

Still, across the sandy Sologne, where Francois and the court once hunted deer, and which now grows a wine-crop which cultivators did not believe possible in the olden days, is Cheverny, Cour-Cheverny, and Beauregard, and still within a short radius Chaumont on the Loire, one time the property of that family of French emigrés who gave the names of Chaumont and Leroy to two up-State New York towns.

A round of 50 kilometers will do all of these and bring one back again to Blois in time for dinner. The chateaux at Blois and Chambord are open every day, but those latterly mentioned may be visited only on special occasions, or in the



absence of the families now living in them. This is the case at Chaumont, for instance, which may only be viewed on Thursdays. One should make inquiries at the hotel at Blois as the opening frequently change.

The Hotel d'Angleterre et Chambord, at Blois, is a most excellent establishment of its kind. It loses somewhat the character of the *pays* in that it is so well-appointed in many little ways that the modern traveler appreciates, but all the same it is a very satisfactory hotel, indeed, and its graveled and covered courtyard and the amiability of its host and hostess make it an ideal automobilists' hotel. It has, moreover, quite the best situation in Blois, and you may dine, if you like, on the terrace overlooking the river, quite in spirit with the whole character of this soft, pleasant land. There is to be found a "tire stock" at Blois, and the *mécaniciens*, while not possessors of imposing establishments, are quite equal to the usual needed repairs.

Amboise Best Remembered of All Chateaux.

On toward Touraine from Blois, having previously visited Chaumont, one does the 37 kilometers of straightaway road to Amboise in almost no time at all. The road is absolutely flat, and runs close beside the Loire, which one crosses at Pocé to arrive at Amboise.

Amboise will be perhaps the best remembered of all the chateaux of the Loire. You may not "kodak" it, at least not inside the walls, without written permission from the Duc de Parma, to whom it belongs. Remember this and not attempt to do so, or you will be handed over to a *gendarme*, who will make you open your camera and destroy your films in his presence.

The hotel accommodation of Amboise is wholly unworthy. The Lion d'Or, a pretentious establishment on the quai, directly beneath the battlemented walls of the chateau from whence one day hung the murdered Huguenots in chains, is very far from being an efficient establishment. It doesn't even fill the bill as well as it might be made to do, and this of itself is unpardonable in the conduct of a French hotel. The visiting automobilist will do well to leave his machine at the quaside garage, even though it costs him a franc, and not attempt to get even his *déjeuner* at Amboise. If he must eat let him hunt up some little countryman's inn—there are one or two in the town nearby—and thus not pour profit into the coffers of a landlord who hasn't yet risen to the art of catering to an automobile clientele as well as he might or ought.

By the River Road to Delightful Tours.

From Amboise one may go direct to Tours by the river road or mount through the *Fôret d'Amboise*, the venue of the royal stag and wild-boar hunts of the days of François Premier and Henri II, and so to Chenonceaux in the valley of the Cher. The former program is preferable, for the Hotel du Bon Laboureur at Chenonceaux is nothing great, being simply a country-town hotel, which has lost its head over the influx of tourists, and grown decidedly commonplace in its appointments and its cooking. It's a good enough place to lunch, for there is nothing unwholesome about it, and one must come to Chenonceaux for lunch, as the chateau may only be visited between two and four in the afternoon, and not every day at that. Inquire as to this at Tours.

Tours is delightful, though it hasn't a chateau within its boundaries: Plessis-les-Tours, on the outskirts, is to-day a mere fragment, though it was once the favorite residence of Louis XI. One has to get his chief amusement out of Tours from its cathedral of St. Gatien, which Charles IX called "a bejeweled frontispiece of architecture," and the remains of the old abbey churches of St. Martin and St. Gregory. There is the birthplace of Balzac somewhere on the Rue Nationale, if one can only find it out and would worship at a literary shrine of the first rank. It will take some hunting up, as not every one in Tours knows of it, and there are not even picture-post cards of it on sale. Besides this, Tours has a magnificent



RUE JEANNE D'ARC IN ORLEANS, ONLY PASSABLY INTERESTING.

modern Hotel de Ville, quite the most splendid example of modern French Renaissance architecture extant, and there is a railway station which is a model in its appointments and services. The streets, cafés and hotels of Tours are as gorgeous as those of Paris, but are by no means slavish imitations thereof. Tours is still the delightful provincial capital of old Touraine.

As for hotels, one can hardly go wrong in Tours. There is the splendid Hotel de l'Univers, where one houses his automobile in a palatial garage, and takes his ease at dinner in full dress—if that really is taking one's ease—and then there is the little *commis-voyageur* Hotel du Croissant, in the Rue Gambetta back of the postoffice, where one gets the real thing, and as bountiful and excellent repasts as can be found throughout this land of plenty and good things to eat. It is more democratic than the Hotel de l'Univers, but the eating has decidedly more of character to it, and is a good deal better as to its cooking. The praises of the former establishment have been sung by writers of all classes of ability, and all grades of judgment, from Henry James downward, but the Hotel du Croissant is evidently a discovery of the author of these lines, as he has never met anyone in a dozen years of French travel who ever heard of it, much less having stayed there. Anything you want in the auto line is to be had at Tours in any one of the garages.

One Can Pass the Night at Loches.

If one comes out from Tours to Chenonceaux following the road by the bank of the Cher via Bléré, he must climb up to the plateau between Chenonceaux and Loches, and, crossing the



BLOIS' CHATEAU IS RICH IN HISTORY AND LEGEND.

Fôret de Loches, descend abruptly into the latter. One may pass the night at Loches readily and comfortably enough, having easily made the run (only 30 kilometers), after having viewed the splendors of Chenonceaux in the afternoon, for there is remarkably good accommodation to be had at the bannally named Hotel de la Promenade. This hotel is *bon marché*, but its déjeuner would be a marvel of bountifulness and excellence at any price. The déjeuner and dinner at this commercial-traveler sort of an hotel is a very satisfying meal indeed—the French *commis-voyageur* usually stokes heavily, though he demands that it shall be a prime quality of *nourriture*. There is another hotel at Loches—the Hotel de France—but it is not so good, and the patron's attempts at speaking English are painful and ludicrous, besides which you pay 50 centimes or a franc more for everything because of this attraction (sic).

The sights of Loches and its immediate environs are good for half a day. There is the exceedingly spectacular Renaissance chateau, the old, medieval donjon—a relic of an earlier chateau—which contains the iron cage invented by the Cardinal Balu for violent prisoners of State, and of which curiously enough he was himself the first occupant. Then there is the great

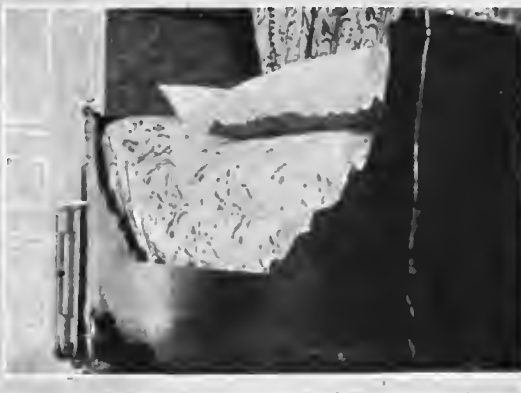
Chinon is a genuine, self-sufficient little provincial French town, whose inhabitants care not what is happening in Paris or elsewhere, and are only interested in the price of the wine crop or of this season's dried prunes. It has the relics of three non-contemporary medieval chateaux sitting proudly on a colline overlooking the town, and, besides, it has as quaint an array of old stone and timber house-fronts, coming down from medieval times, as one will see in all France. It is, moreover, the reputed birthplace of that Gargantuan eater, litterateur and wit, François Rebelais, but no one knows enough about the fact to be able to point out the house in which he was born. The Hotel de France at Chinon is about the best country hotel of its class in these parts. It is strictly *bourgeois*; the patron himself cooks the dinner and receives you and your automobile with open arms and speeds you with regret, leaving meanwhile a half a dozen fussy and fat *commis-voyageurs* complaining because their next course is not more promptly served.

A Forest Road to Azay-le-Rideau.

If one has followed the exact outline of this itinerary up to now on his automobile he must retrace his steps and traverse the



HOTEL DU CROISSANT, TOURS.



BED IN HOTEL BUDAN, SAUMUR.



HOTEL D'ANGLETERRE, BLOIS.

IN AND OUT OF SOME LOIRE HOTELS.

barbican gateway—a veritable stage-accessory—and the bizarre Eglise de St. Ours—one of the most fantastically built churches in all France, and dating from the twelfth century, at least. The history of the connection of Agnes Sorel with this fine old church will make interesting reading for any who care for French romance. Nearby are the chateaux of Beaulieu and Montresor. In the former lived for a time the *gentil Agnès*, the beloved of Charles IX, and François Premier alike. François finally came to believe she was fickle, and the *gentil Agnès* dropped out of history, not being able to live down some satirical verses the art-loving monarch penned about her.

Delightful Run to Chinon.

It is a delightful cross-country ride of seventy-five or eighty kilometers to Chinon on the Vienne, mostly by "Routes Departementales," which, if not of the importance, generally speaking, of the "Routes Nationales," are nearly as good as to surface and upkeep. Nothing is to be dreaded on any of the five chief classes of roadways in France, save in times of very severe rains, and then roads are bad everywhere. Everywhere in Touraine the roads are astonishingly good, indeed, they are probably the best, take them all in all, in France, and there are no hills except as one mounts up out of one river valley and drops down into another.

Fôret de Chinon to Azay-le-Rideau, twenty-two kilometers. The road rises out of Chinon like the side of a house, and in a moment one is in the midst of the forest, where rabbits continually scurry across the road and a deer or a *sanglier* is apt to cross one's path at any time. It's a genuine bit of unspoiled wild-wood such as abounds only in France; that is, with perfect roads traversing them in every direction.

Chicogean Wanted to Remove This Chateaux.

Azay-le-Rideau has been called "the finest flower of the French Renaissance." With the exception of Langeais, it is quite the most livable-looking of all the Loire chateaux. In spite of this its owners have come into hard lines and the property, within a year, has been thrown upon the market. An American had all but pounced upon it and had proposed to tear it down stone by stone and erect it again on the shores of Lake Michigan, but the French Government stepped in and said nay, supplied the money for the purchase and made of it forthwith a "*monument historique*," the property of the State. Good work! The French nation should be deeply grateful.

Don't eat or sleep at Azay-le-Rideau if you can help it, but go on to Langeais, only ten kilometers away—it's astonishing how short the distances are between these great architectural treasures of Touraine.

Langeais' Fine Residential Chateau.

Langeais and its chateau are remarkable. You *déjeuner très bien* at the Lion d'Or, and it is but the proverbial stone's throw to the portcullis of the chateau. You pay a franc to a neat, white-coiffed *bonne* (you will see all through the Loire country the most remarkable succession of *coiffes* in France, with perhaps the exception of Brittany), and a dress-suited valet will take you in tow and show you the round of all the chief apartments of this fine residential chateau of to-day, even though in medieval times it was a fortress-chateau, a fact you will well realize when you first enter the portcullis gateway and afterwards make the tour of the crenelated battlements, through the holes in the floor of the outer gallery of which they used to pour boiling lead and red-hot coals on the heads of the besiegers.

The family of the present proprietor of the Chateau de Langeais graciously go into hiding every afternoon and let the public stroll about their living rooms, which are all furnished as completely as may be possible after a period contemporary with the romantic life of the chateau of other days. The good taste and judgment of this chatelain of Langeais might well be imitated by men of affairs elsewhere, for he is a busy man who

soreau, sitting right on the river's bank. Its situation is good and bad, from opposite points of view, but it is an imposing bit of architecture nevertheless. History has much to say about it and its inhabitants, and Dumas in "La Dame de Montsoreau" has embroidered them with fiction.

Lieut. Lahm Is In Attendance at Saumur.

Saumur, its chateau, its hotel de ville, its Colline des Moulins, its Hotel Budan, and its vin blanc de Saumur, sets itself out large on the horizon of Loire attractions. The traveler must hunt all these things out for himself on arriving, but on no account must he neglect the Hotel Budan, right on the quai at the end of the *pont*. It comes desperately near to being the best hotel between Paris and Bordeaux. It has an excellent garage, and its sleeping rooms are palatial, if just the least bit old-fashioned. Its table and its wine cellar are irreproachable, and its patron and his wife are of a class seldom met with among the hotelkeepers of any land. What more would one want to find?

Saumur is a genuine and thorough good thing, though its chateau, as a sight or an architectural masterpiece, is in quite another class from those flowery examples higher up in the



CHENONCEAUX.



LOCHES.



CHAMBORD.

THREE OF THE PICTURESQUE CASTLES OF THE LOIRE.

gains his livelihood in "*les affaires*" in Paris, like any hustler in Chicago or New York.

Back to Tours by River Road.

Following the river road back to Tours for twenty-four kilometers one passes the ruined castle of Richelieu's rival, Cinq-Mars, the perfidious Monsieur le Grand of the days of Louis XIII. Just beyond Cinq-Mars is the Chateau de Luynes, with a wonderful situation on a colline overlooking the river. It is a most taking outline of a chateau, with towers and turrets just where they ought to be to fill one's preconceived ideas, and the graceful Renaissance decorations of its courtyard are remarked as among the best of their epoch. This is as far as one's knowledge of the Chateau de Luynes goes.

It is forty-odd kilometers from Langeais to Saumur, where the imitation champagne comes from that is better to drink than real champagne—it is less heady and less expensive, two much-to-be-appreciated qualifications. En route one should cross the Loire again at Port Boulet, twenty-two kilometers from Tours, and follow the road by the left bank. It is but a short detour to Fontevault, where a quartette of Plantagenet royalties are buried, much to England's chagrin. It is a shrine to be visited by all who are in the neighborhood.

Back to the Loire again, one passes the Chateau de Mont-

Loire valley. What it lacks in these respects it more than makes up in character. It is a thing to see. The great government cavalry school at Saumur will interest Americans from the fact that Lieut. Lahm is in attendance there, he who won the Gordon Bennett cup in the balloon race of last year.

On the Way to Angers.

From Saumur to Angers, by either bank of the Loire, is fifty kilometers or a little more. By either route it is a delightful road, the whole character of the country changing with each kilometer. Near Angers the roads assume a dusky hue, but it is not caused by "oil," "tarmac," or "westrumite"; it is simply a surface of pounded slate, one of the chief products of the neighborhood, and a mighty good road surface it is.

Angers' marvels are many. It has a cathedral which bridges the gulf between Romanesque and Gothic architecture in such a remarkable and distinct fashion that it gave birth to a new style of building known as Angevin. The castle of Angers, built with seventeen black-banded towers along its ramparts, each with alternate layers of slate and grey-brown stone, is the most marvelously impressive chateau-fortress on the Loire. Shakespeare's King John called the city "Black Angers."

Angers, in the Cheval Blanc, a hostelry which has come down in one form or another from the fifteenth century, has perhaps

the best and most nearly perfectly appointed provincial hotel in France. It is not cheap, but it is good—very, very good. It is not modern, but it is more nearly up-to-date than many other establishments with greater claims.

One may dine in a delightfully arranged *salle à manger* at the Cheval Blanc or in the glass-covered courtyard, as he pleases, and his automobile will rest luxuriously meanwhile in a second covered courtyard to the rear. Beyond this, the Cheval Blanc at Angers and its fussy old patron with the weird cravat and the smooth-shuffling, antique garçons form an indescribable combination with which one must become personally acquainted in order to fully appreciate.

Innumerable Vineyards on River Banks.

Below Angers, on both banks, are innumerable vineyards and "*chateaux de commerce*," which furnish the wine-drinking public with the best of the Loire *crus*. On the right bank is Cham-tocé, with an old, ruined fortified chateau rising above the main street in real robber baron fashion. Varades is the next town of note, though there is nothing for the automobilist to remark until he runs into Ançenis. Here there is another old ruined chateau, and a great wire-rope bridge across the Loire, on which is a huge black-and-white scale which marks the rise and fall of the Loire flood, for in spite of the fact that the river bed is half bare most of the time, it can rise to an inordinate height, and then a warning is needed, that the lowland population below Ançenis may make such preparation as may be possible, that they may not be swept away.

Next to the Good Things of the Region.

At Ançenis at the Hotel des Voyageurs, one may *déjeuner* very well indeed on the local dishes, the genuine *plats du jour* of the country, which after all is what one comes to a new country for, or ought to be. It is better so than to be fed imitation Parisian repasts or worse canned stuff of a doubtful quality, and whether one is an automobilist or a "mere tourist" he likes to get next to the good things of the particular region he is traveling through for the moment—Bourgogne for snails, Normandy for ducks and Touraine for wine, *rillettes*, and prunes.

Ançenis is printed in large letters on the maps, but it has only 3,000 inhabitants, and there is not much doing in the way of automobile repairs should one happen to want them.

On the road again for Nantes one passes Oudon and remarks a spectacular-looking towered and turreted chateau, very stagey and possessed of nothing of interest as to its history except that it was erected as a *passé temps* of some *nouveau riche* with more money than artistic sense.

Nantes Is an Overgrown Provincial City.

The road into Nantes, though it be a great "Route Nationale," is by a series of switchback hills, which, if nothing terrifying, are at least annoying by their frequency. One is continually rushing down one slope and hoping that he will be able to climb the next on top speed.

Nantes is a great, big, overgrown provincial metropolis. It is a seaport of rank; has factories and machine shops and great wide streets and boulevards—and again others not so wide, which are so frightfully encumbered with tram lines, railway tracks and what-not that they are very difficult for automobile navigation. All the same Nantes should not be omitted from any Loire itinerary. The cathedral of St. Pierre and the celebrated sculptured tomb of François, the second Duc de Bretagne, are themselves worth the journey thither, and there is the fortress-chateau enclosing the Logis de la Duchesse Anne, which is a remarkably beautiful Renaissance work, if not very stupendous.

Delightful Old-World Towns Near Nantes.

Within a very short radius of Nantes are a fringe of delightful old-world towns, little or not at all known to the casual traveler. There is a novelty and quaintness about Cholet and Clisson and Geurande—with its ramparts and old gates—and

the curious salt manufacturing town of Bourg de Batz, to say nothing of the great seaport of St. Nazaire, and Nantes' watering place, Pornic, which will give a new chapter of emotions to the heart of the traveler already jaded with a round of big towns and conventional resorts.

The hotels of Nantes are "so-so." The Hotel de France, the premier establishment, so called, has been abominably transformed within a few months until it is not the ghost of its former self, but simply a fatuous pseudo-de-luxe hostelry which has no excuse for being at all. If you are an automobilist you are immediately shot into a room for which the price is five times its worth—this before you have time to explain that you are not a millionaire—all automobilists look alike in cap, goggles, and waterproof. Then there is the restaurant, especially designed to catch automobilists, too, with a gold-laced jackey bowing and scraping before the door. It's simply awful, and with all this you have to house your machine in a dark, stuffy little hole of a garage in which it is impossible to turn it around.

The best hotels in Nantes for the automobilist are the Hotel de Bretagne and the Hotel du Commerce et des Colonies.

No Finer Touring Ground in the World.

The itinerary herein outlined does not comprehend all of the roads to and from the chateaux of Touraine and the Loire country, no more than it epitomizes all the sights and scenes and all the delights of travel in this soft land of which Dante wrote: *Terra molle e dolce e diletta*. There is no finer touring ground in all the world, and its "sights" are more numerous and more enthrancing than any other group within a similar radius of the earth's surface.

There are four books which will smooth anyone's way through the highways and byways of this delightful land—the "Guide-Michelin, Joanne's "La Loire," "The Chateaux of Old Touraine and the Loire Country," by the author of these lines, and James' "Little Tour in France." The two first-named are indispensable; no other guides are of a whit the value of these to the automobile tourist in the chateau country.

A thousand kilometers in and out will cover the itinerary. It can be done—in part—in a week, but a fortnight or three weeks in this land of splendor and plenty will be well spent. To this all who have made the tour will agree.

A Skeleton Itinerary to the Chateau Country.

Cities.	Kilometers.	Hotels.	Price.
Le Havre .....	..	d'Angleterre	xx
Rouen	86	de la Poste	xx
Evreux	55	du Grand-Cerf	xx
Dreux	40	de France	xx
Chartres	34	Duc de Chartres	xx
Orleans	72	Moderne	xx
Beaugency	26	de l'Écu de Bretagne	xx
Blois	32	d'Angleterre et Chambord	xx
Chambord	15		
Cheverny	20		
Beauregard	10		
Chaumont	15	Ave du Chateau	x
Amboise	17	Llon d'Or	xx
Chenonceaux	12	Bon Laboureur	xx
Loches	29	de la Promenade	x
Tours	46	de l'Univ'ers	xxx
Langeais	24	du Croissant	xx
Azay-le-Rideau	10	Lion d'Or	xx
Chilnon	22	Grand Monarque	x
Fontevault	23	de France	x
Montsoreau	6		
Saumur	13	Budan	xx
Ponts de Cé	41	Cheval Blanc	xx
Angers	6	des Voyageurs	x
Ançenis	53	de Bretagne	xx
Nantes	38	du Commerce et des Colonies	xx

Total745
 x Hotels under nine francs per day.
 xx Hotels from nine to thirteen francs per day.
 xxx Hotels at more than thirteen francs per day.

NORMANDY COURSE CHOSEN FOR GRAND PRIX

PARIS, Feb. 13.—After a long process of elimination, the Seine Inferieure has been chosen as the scene of this year's race. For the last month members of the Sporting Commission have been visiting proposed districts, each member being allotted a course. The various reports were compared and a certain number chosen to be visited by the full committee. For some time the Seine Inferieure and the Eure were close competitors. Finally the former won, not so much on road merit, for it is admitted that a dozen courses could be found in France equal to this, but because it offers a subvention of \$20,000, is conveniently situated on the coast, has a good headquarters in the town of Dieppe, and is likely to attract a large number of French and foreign spectators on account of its geographical position. This quarter of Normandy is the most fashionable and populous holiday district in France, and Victor Breyer, who is acting as general manager for the club, should have no difficulty in handing a big balance over as net profits. English and American visitors to the race will find the course advantageously placed. There is a daily service of fast boats from English ports to Dieppe, the service being so good that Londoners frequently pass the week end at Dieppe; Americans, whether they land at Havre or Cherbourg, will only be a few miles from the course.

Description of the Grand Prix Course.

The circuit finally selected for the Grand Prix contest and the Sporting Commission Cup, to be run during the first week in July, consists of a triangular set of roads resembling closely in general appearance the Sarthe circuit of last year. Dieppe, a watering place of about 22,000 inhabitants, is the only important town on the course, and will doubtless act as general headquarters for the race officials and the various teams. Londinières hangs to another end of the triangular course, and Eu keeps guard over the northern point of the circuit. Londinières is the point nearest to Paris, being 105 miles northwest of the capital. The course is practically an equilateral triangle, the distances being Dieppe to Londinières 14 miles; Londinières to Eu 16 miles; Eu to Dieppe 17 miles. This gives a total of forty-seven or forty-eight miles; the exact distance has not yet been determined. As it is intended to run the race over a five hundred miles course, ten or eleven rounds will have to be made. With at least thirty-four cars, passages before the grandstand will be numerous, and there will be none of the waiting for cars to arrive, which has characterized recent French contests on long circuits. This change of policy is due to the desire of the French club to make the race more of a spectacular event, and a more profitable one financially. It is only because America proved that a short course was not dangerous for the passing and repassing of machines that France has decided to have a circuit of about the length of the Vanderbilt course. Starting from Londinières, the southern point of the course, and running up northwards towards Eu, a six per cent. grade about a mile and a half long, with two or three sharp turns, has to be climbed. The road is excellent, and at sixty-five miles an hour there is no jolting. There are several long, straight lines, then winding portions of just sufficient difficulty to keep the drivers alive to the business. Here and there a little hamlet of no importance, varied landscape, but always that beauty for which Normandy is famous the world over. The width is generally satisfactory; at various spots, the grassy side banks have been allowed to encroach upon the roadway, reducing the width to fifteen feet, but it will not be difficult to gain space where needed. The course passes right through the village of Eu, entering by a very wide road; there is a turn to the left in the central market place of the village, and a short, steep hill to climb. From Eu to Dieppe the course runs almost parallel to the seashore. The villages of Criel and Tocqueville are passed without any difficulty, then commences one of the finest racing courses to be found in France. Straight stretches, a few easy turns, ups and downs, and the Dieppe turn is reached.

It is probably on this leg of the course that the grandstands will be erected. Although known as the Dieppe turn, the town is actually a couple of miles away, a few houses stand at the corner, but the turn will be made without difficulty. The third leg of the course, from Dieppe to Londinières, is the weak portion of the circuit. The first few miles are moderate, and the villages of Ancourt and Bellengreville can be run through without difficulty. Envermeu straggles out on each side of the road for about three-quarters of a mile, and contains a sharp turn, which is likely to give some difficulty at high speed. The village is no sooner left behind than another difficulty presents itself. From Envermeu to Londinières an insignificant local railway runs alongside the course, and cuts down the width considerably. The railroad is mounted on an embankment varying in height from twenty inches to nine feet, thus forming a solid wall. A neck and neck race at this point is likely to be an emotional affair for both drivers and public. Arriving at Londinières the turn for the next leg of the course is exactly opposite the small railway station. Of course, on the day of the race the wheezy little engine will not pull its half dozen carriages and baggage wagon along at fifteen miles an hour. The contrast would be ludicrous. Everywhere the road surface is excellent. Envermeu will be as strongly barricaded as if it were to withstand a siege, and the thirty-four will be able to rush through without any fear of injuring the inhabitants or lessening the number of roosters. The turn in the village of Eu is on a very open place, and when strongly boarded round will be perfectly safe and possibly the most interesting spot on the course. As to the wall formed by the railway, there is nothing to be done; drivers knowing the difficulty will have to exercise a little caution. There were many more dangerous spots on the Auvergne course, which produced no accidents.

Some Good Features of the Circuit.

Advantages of the course are many. It is only three hours' railway journey from Paris; accommodation for big crowds can be obtained at Dieppe and the smaller seacoast resorts, the roads are of good average width, excellent surface, and well kept. Its proximity to the sea assures a mild temperature and will bring together many spectators willing to go to the seaside to see a race that would not interest them if it were run at some distant inland district.

It is probable that the race will be run left-handed, with the starting point on the seashore leg near to Dieppe. Grandstands and fuel stations will be erected here, the work of filling tanks, changing tires, etc., being in full view of the spectators. As is generally well known, there is no weight limit this year. The racers will be given half their fuel at the commencement of the contest, and will take up the remainder as they desire.

What Influenced the A. C. F. in Its Selection.

The Automobile Club committee from the outset has been the more favorable to the Seine Inferieure proposition on account of that district being "nearer England." Ah, that famous *entente cordiale* influenced many actions and considerations. To be near "our dear old England" is a pet proposition. With the race located in the Seine Inferieure, which partly borders the Channel, the chances are good for "English trade." Many Englishmen will cross over to see the contest, and, moreover, many Englishmen, during the summer, pass their vacations at French resorts all along the coast. Optimists even say that if the race is run in this part of France, King Edward will surely be "among those present," because of the convenience in arriving on the scene. It is argued that if the contest were held in the Eure, perhaps a hundred miles further from England, the King would hesitate about coming. There may be something in this line of argument, considering the fact that the King always travels third-class in an emigrant train and hesitates before extending his voyage.

CHRISTIE RACER FOR THE GRAND PRIX

AMERICA'S representative in the struggle between France, England, Germany, Belgium, Italy and the United States for the Grand Prix will be a front-drive Christie, now under construction in New York. The racer is an entirely new machine, differing in many respects from the ill-fated flyer of the Vanderbilt test. Frame is of channel section pressed steel, with rounded rear. Wheelbase is 100 inches, track 53 inches. The total weight of the machine is estimated at 1,780 pounds, this being in all probability the lowest weight of any car engaged in the Grand Prix. A large circular nickel steel crankcase is carried across the fore end of the chassis and assembles the whole of the motive power. The engine will have four separate steel cylinders bolted down to the crankcase, their dimensions being 7 1-4 inches bore by 7 1-4 inches stroke. They form two pairs, the second pair being slightly behind the first pair. A two-throw crankshaft is employed, with hollow steel connecting rods. Babbitt bearings are employed for the crankshaft. All valves are in the head, operated by rocker arms. Two speeds and reverse are provided, with direct drive on the high through double universal joint. Ignition will be by battery and coil. The engine is water-cooled, a very fine tubular radiator being employed. The engine is very compactly placed over the front axle and occupies but a small part of the length of the chassis. The radiator tubes running from one side of the frame to the other occupy all the room

between the engine and the dashboard. Water circulation is assured by a gear-driven pump. Lubrication is by a Pederson pressure feed oiler. The clutch is of inverted cone type covered with woven camel's hair. Semi-elliptic springs are used in the rear, with coil springs and a large rubber buffer in front. Expanding and contracting brakes are fitted to the rear wheels. The gasoline tank is carried behind the seats in a special cradle with metal against wood. It can be completely lifted out of its frame for examination or verification before or after the race. The capacity of the tank is twenty-seven gallons. As the total allowance of gasoline is about fifty-three gallons, it is intended only to stop once during the race for replenishing the supply. The gasoline is fed under pressure to the engine. The size of the wheels and the make of tires have not yet been decided upon. Christie patent rims, however, will be employed. The spokes will be of hollow steel and will be ten in number compared with twelve on last year's racer.

In the official engagement Walter Christie is entered as driver of the machine. We are informed, however, that the machine will probably be in the hands of Louis Strang, who acted as Christie's mechanic in the Vanderbilt contest. Walter Christie and his party will leave for France in time to thoroughly try out the machine on the course, and after the race will tour through Europe on a front-drive semi-racing machine.

SIX NATIONS AND THIRTY-FOUR CARS FOR GRAND PRIX

PARIS, Feb. 4.—Secretary Sautin, of the Commission Sportive, had closed down his desk and was preparing to leave the club rooms when an agreeable inrush of business detained him. The list of entries for the Grand Prix had been made up with a total of 29, and, owing to the early closing of the American mail, had been dispatched as final, both officials and pressmen being certain that no more would be received.

Thirty minutes before the official closing time a cable was received from New York. To the surprise of all it was found to contain the engagement of a Christie racer in the Grand Prix. Close on its heels came a registered letter with a check for \$1,000 as entrance fee for the Italian car Aquila Italiana. The two names were added to the list amid many expressions of satisfaction. "We shall have no more," remarked sober minded Secretary Sautin as he glanced up at the clock which registered 15 minutes to six. Just then the door opened and in walked M. Desjoyaux, the Paris manager of Mercedes interests, with 15,000 francs of blue bank notes in his hand. Three Mercedes were engaged. Business was not over, for behind the German agent were a couple of tire manufacturers with their modest contribution. It was a *coup de theatre* not usually seen at the A. C. F., and when the books had been closed and the money put under lock and key, it was not surprising that there were two or three joyous groups over an aperitif in a nearby café. To the list published last week in THE AUTOMOBILE should now be added the following:

- 30 Aquila Italiana (——).
- 31 Mercedes (Jenatzy).
- 32 Mercedes (Werner).
- 33 Mercedes (Willy Poege or Burton).
- 34 Christie (Louis Strang or Walter Christie).

In last year's Grand Prix there were 32 machines, representing three nations. This year there are 34 machines and six nations. France has the lion's share with 23 entries, her united competitors only numbering eleven. Now that Mercedes has come into line it is confidently declared in Paris that Fiat and

Itala will participate in the Grand Prix. Since the abolition of the weight limit and the imposing of a limited fuel supply, Germany and Italy have shown little enthusiasm for the French race. The idea seems to have prevailed that the French had discovered a new and more efficient fuel, which they would use to rout their rivals. The danger was more fancied than real, at least so declare the French officials, but the Germans and Italians readily believed what they suspected to be true. Germany has broken the ice, and every official on the Sporting Commission is rubbing his hands with joy at the prospect of three Fiat and three Itala paying double fees and carrying the total list of entries to the record figure of forty. The rules of the race allow late entries to be received at double fees until three weeks before the day fixed for the race. There is, therefore, no immediate hurry.

It will be noted that changes have been made in the composition of the Mercedes team. Jenatzy remains at his post, and is joined by Werner and Willy Poege or Burton, the Britisher. Werner is now in the employ of the German Emperor, and has charge of His Majesty's magnificent selection of automobiles. For a number of years he was the favorite driver of the late Clarence Gray Dinsmore.

Apart from engagements of cars three entries have been received for the tire contest held as an auxiliary of the Grand Prix. They are Falconnet-Perrodeaud, Hutchinson and Boland, all firms of secondary importance. Continental, Dunlop, Michelin, Engelbert and Samson have reserved tire stations on the course, but are not taking part in the competition. Since the beginning of the year a total of \$36,200 has passed into the hands of the A. C. F. officials in connection with the Grand Prix. Thirty-four thousand dollars came from entrance fees for the machines, \$1,200 for the tire competition, and \$1,000 for stations on the course. If the six Italian machines engage at double fees, as is expected, the total income from entries will reach \$48,200. The \$1,000 entrance fee gives the right to a repair station on the course, but any other firms not taking part in the contest, but having some direct interest, may engage stands at \$200 each.

ESSENTIAL ELEMENTS OF ELECTRIC IGNITION

By CHARLES B. HAYWARD.

THERE is probably nothing connected with the operation of the internal combustion motor as represented by the types, in which it is at present used in such large numbers in automobiles and motor boats, that puzzles the user to the same extent as does the ignition. It is not alone one of the most profound of mysteries to the beginner when entering upon his novitiate, but it remains so longer than anything else about the motor. Doubtless the popular and widespread impression regarding the mysterious nature of electricity as a force that prevails is largely responsible for this, while the fact that such a belief is fostered rather than corrected, by the awesome regard in which the average autoist holds the subject, may probably be held accountable for the slow progress made. But a far more potent factor in retarding the thorough education of the everyday driver in this subject, is to be found in the fact that he approaches it from the wrong end; he is confronted by an application of electricity and is compelled to master its ins and outs wholly through observation and practice, the greater part of which must necessarily be of the "hit and miss" variety. Not having any foundation of knowledge or experience upon which to fall back, he must grope blindly for trouble whenever called upon to remedy it. Despite this, however, the majority of autoists come to have a fair knowledge of the ignition system as a whole, in the course of time, but as a consequence of this manner of acquiring their education, they never learn the fundamental principles underlying the subject, a knowledge of which is essential to its thorough understanding.

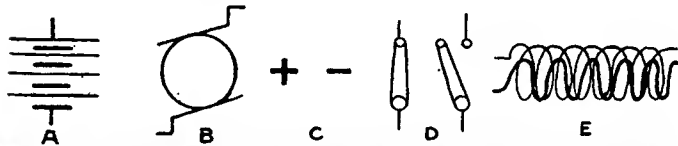


FIG. 1.—Conventional symbols generally employed in electric wiring diagrams to represent the various forms of apparatus used in the circuit. As explained in the text, these are battery, generator, polarity indicators, switch in open and closed positions, and an induction coil.

Learning the Rudiments an Absolute Necessity.

Any system of education which started the beginner at the most advanced stage of the curriculum and compelled him to master it without ever being enlightened in its groundwork, would naturally be considered absurd, yet this is the way the average autoist gains his knowledge of ignition systems generally, and the subject of electricity as applied to them. In the present article it is the purpose to outline the rudiments of the matter before passing on to a consideration of the various systems of ignition now in vogue, together with a statement of their advantages and disadvantages as revealed by extended practice, as well as the trend of current practice as shown by changes that have taken place during the past few years. As a means of doing this in a comprehensive manner, it has been found necessary to divide the subject into several parts, in each of which a study of the various essentials of the electrical method of ignition will be taken up, as closely as possible, in the order of their importance. In treating any such subject as this, it is naturally impossible to give equal heed to the status of every autoist or every group of autoists, where the matter of electrical education is concerned; many are well advanced and feel so far above anything that savors of the elementary, as to pass it by disdainfully; others not so far along find descriptions couched wholly in technical terms and without further explanation, beyond their comprehension, while there is a very large class to whom even the rudiments of the subject are as Sanscrit, and it is to this group that the first chapter of this article, at least, will appeal. Only such terms as are essential to a proper comprehension of the

subject, and which even the novice feels the necessity of being able to use understandingly, will be employed.

Characteristics of Electric Currents.

Naturally the first thing the beginner wishes to learn is, What is electricity? He is not alone in this desire, for the most erudite of scientists have been attempting to solve the problem to their own satisfaction for many years. While knowledge and skill in the generation and handling of electric currents have reached

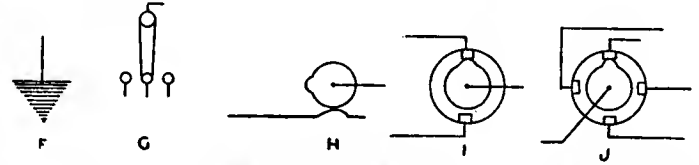


FIG. 2.—Symbols continued; ground connection, multiple way switch, single, double and quad timer.

an advanced stage, particularly within the past decade, there has been no material progress made in the purely academic side of the subject, so this first and most natural question must go unanswered. As may be surmised, the exact nature of this mysterious force is not essential to an understanding of its use in this connection. Electricity is assumed to flow, and this is also a moot question, as just how it travels, whether in a wire or along its surface, is not known, but for present purposes, the assumption may be taken as correct. From early days, writers on the subject have compared the action of an electric current to that of water flowing in a pipe, and no better simile to illustrate some of its most important characteristics has ever been devised, as both are analogous in many respects.

Thus, water flowing in a pipe, must be under pressure, and the same is true of an electric current; it must have volume, and this is also true of electricity. Both meet with a certain amount of resistance to their travel, and in both cases the result of their action is similar; in other words, pressure times volume, less resistance, will give the amount of water of which a certain size of pipe is capable of delivering, and these factors are equally available to calculate the amount of *current* passing over a given wire, except that distinctive terms are naturally given these factors to distinguish them in the case of the latter. For instance, pressure is calculated in terms of voltage, potential or electromotive force, usually written "e. m. f.," these three being synonymous. The volt, named after Volta, the Italian scientist in honor of his researches in this field, representing the unit of pressure, is the electrical equivalent of pounds per square inch in the case of water flowing in a pipe. To indicate volume, the term Amperes is employed, its derivation being similar to that of

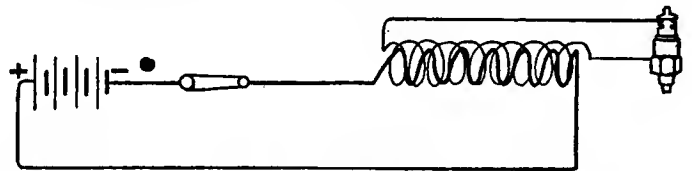


FIG. 3.—Theoretical wiring circuit for single cylinder motor; without timer.

volt, Ampere having been a noted French investigator. But in any consideration of volume, the time element must enter, as gallons per hour in the simile mentioned. This has its equivalent in ampere-hours—a term most commonly employed in speaking of the storage battery or accumulator, and indicating its capacity to perform work. An ampere-hour represents one ampere of current passing for one hour. In the case of the third element, resistance, this is denominated by the term Ohms, of a similar origin to the other two, and representing the unit of

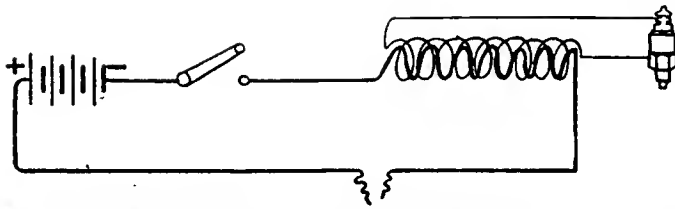


FIG. 4.—Two ways of opening a circuit; with the switch or by an accidental break in the wire; the latter falling free.

resistance to the passage of a current. This and the term Watts, which is the product of voltage multiplied by current, and represents power, are something with which the autoist who does not carry his study of electricity beyond the point required to master present-day ignition systems and their operation, will have little to do and need not burden his mind with needlessly, except insofar as they have a direct bearing on the other elements.

Numerous Popular Fallacies Extant.

Before proceeding any further with this part of the discussion, it will doubtless be found profitable to digress momentarily to explain some of the most erroneous impressions that exist in the popular mind with regard to the nature and action of an electrical current. Probably the most common of these is that regarding the condition of an object, such as a wire, through which a current is passing at the moment—what is known in every-day parlance as a “live” wire. This is generally said to be “charged” by those knowing no different, and contact with anything “charged” is universally considered to result injuriously, if not fatally, to the person touching such a wire. “Live” is both an apt and expressive term to apply to a wire carrying a current, from the popular point of view, but such a wire can never be said to be “charged” in any sense of the word. In other words, it does not store up electricity and give it forth suddenly when contact is made with it, as does a storage battery when short-circuited on itself, or a condenser, or Leyden jar, the latter being but different forms of the same thing; but of these, more later. What does actually happen, is that when a person comes in contact with such a “live” wire, as by placing his hand or other part of his body on it, if he be standing on a good conductor, the latter forms a path for the return of the current to its source, and in consequence, it passes through him. That is, his body has served to bridge a gap and form a short-circuit—the result is popularly termed a shock, but the manner in which it may be received involves a proper understanding of the meaning of the terms, circuit, short-circuit, ground, earth connection and leak, all of which are constantly employed with reference to ignition troubles.

If it be desired that water flow out of one part of a tank and in at another, as is the case in the radiator of the cooling system of a car, it is necessary that there should be a conductor for the water traveling in each direction; the same thing is true of an electric current, and when there is no interruption at any point of either conductor, there is said to be a circuit. Causing such an interruption as by opening a switch, converts it into an “open” circuit; no current passes. Breaking a wire and permitting the broken end to come in contact with something that provides a return path for the current, or allowing the wire to chafe against a moving part of the motor until the insulation is worn off, thus accomplishing the same end, creates a short-circuit. The current finds a new return path to its source, thus completing the circuit short of the point the current is intended to reach, as the spark-plug. Electricity always follows the path of least resistance, so that in order to have a short-circuit, the new path opened by the broken or chafed wire must be of less resistance than the old. If its resistance be very much higher, as in the case of the chafed wire rubbing against some insulating material, nothing happens; as this resistance decreases there will be more or less leakage, but there will be no short-circuit as long as it is appreciably higher than that of the original circuit. If, in the case of the broken wire, this does not strike against anything that forms a return path for the current, the circuit becomes an open

one just as if the switch had been moved intentionally. This is generally termed a short-circuit by the average autoist, but as will be evident there is no circuit at all, or the current would flow, the term open-circuit being somewhat of a misnomer. Other causes of opening the circuit are found in loose connections, permitting the wires to drop, or similar accidents that interpose a gap in the circuit, stopping the flow of the current.

Properties of Various Materials.

In order to gain a fuller understanding of this apparently perplexing matter, the nature of various substances with regard to the electric current must be taken into account. For present purposes it is only necessary to divide them into two classes, that of conductors and non-conductors or insulators, the only element complicating the problem being found in the fact that under certain conditions the same material changes its nature. For commercial purposes the best conductor is copper, and the best insulators are porcelain, glass, fiber, hard rubber, paraffine wax, oil, silk, cotton, wood and the like. All metals, metallic substances and carbons are conductors, and most materials not of this nature are non-conductors, but under the influence of heat some of them lose this property, such as wood and cotton when carbonized by charring, and when wet with water or any alkaline or acid solution, the latter will form a path for the current across any of them. This brings up the subject of “ground” or “earth returns,” the latter being an Anglicized expression. As originally employed all telegraph and telephone circuits were “grounded;” that is, the current was sent from the sending to the receiving station over a wire and permitted to return to its source through the earth. Hence, every circuit not employing an independent return wire has come to be known as grounded, and this represents practically universal practise in the case of automobile wiring, whether the low or high-tension system be employed, and regardless of the source of current.

To give a few concrete examples of this, it may be recalled that it was customary on early cars to make this ground connection from the battery on the nearest part of the chassis that happened to be convenient, and the same was true of the secondary circuit or wiring to the spark plugs themselves, though in

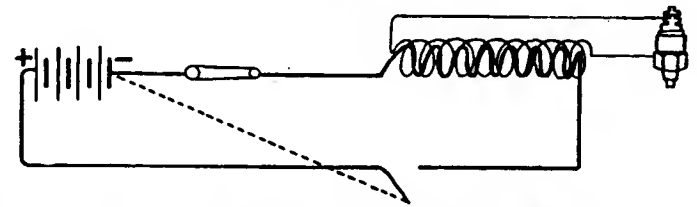


FIG. 5.—Theoretical illustration of a short-circuit; broken wire has become grounded, cutting out the coil.

this case the extremely high potential of the current and its ability to pass over or around obstacles did not render this a matter of the same importance. In the case of the battery, however, with its potential of but six or eight volts at the most, it is different; extra resistance present in the circuit prevents the flow of current exactly the same as restricting the outlet of a pipe through which water is issuing, would lessen the volume delivered. As a result sufficient current does not reach the coil to give satisfactory service, and either the battery or the coil is held responsible, whereas there is really nothing at fault but the poor ground connection. Oil, as already mentioned, is a good insulator, and as a properly lubricated bearing is always surrounded by a film of oil, it will be evident that a

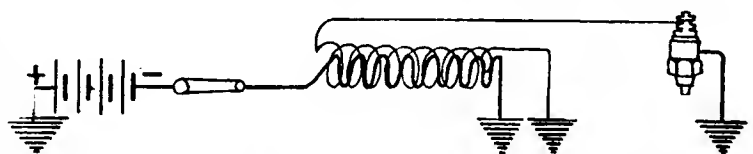


FIG. 6.—Illustration of manner of grounding one side of each circuit on single-cylinder motor; timer omitted.

ground connection which includes such a bearing as the crankshaft in its path is not apt to be of the highest efficiency. While all metals are good conductors, where two pieces are joined, as at the battery or generator, the surfaces must be clean and

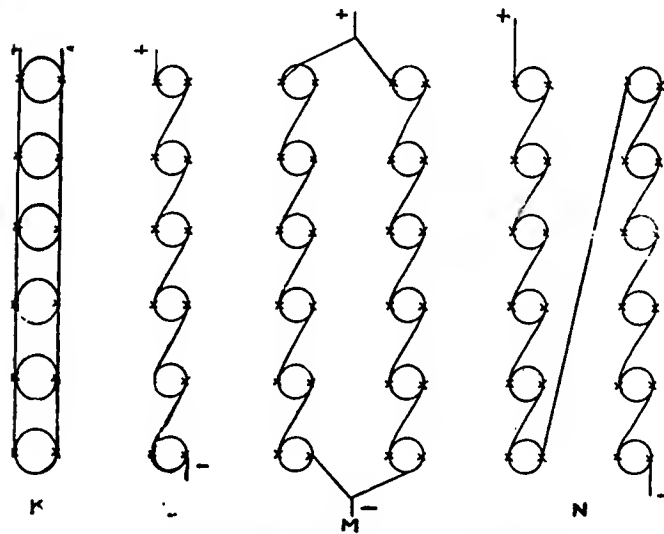


FIG. 7.—Illustrating numerous combinations possible with batteries.

held in firm contact in order not to create extra resistance in the circuit and cause the same trouble as a poorly placed ground connection—that of decreasing the amount of current.

Commoner Symbols and Connections Explained.

Although it is customary with the majority of makers of ignition apparatus to show the various essentials in a circuit such as coils, timers and the like in perspective so as to be readily recognizable by the uninitiated, this is not always the case, and it is well besides for the autoist to be able to recognize them when shown diagrammatically. For this purpose a number of symbols are employed. They are shown in the accompanying sketch and lettered so as to be readily distinguishable. A being the conventional symbol for a battery, each light and heavy line representing a cell so that the drawing is the equivalent of a battery of four cells. Sign B represents any mechanical source of current, such as a dynamo or magneto; in power wiring diagrams, the letter "G" or "M" is inserted in the circle, signifying generator and motor, respectively—in this connection it will be found convenient to have them represent generator, meaning a small direct-current dynamo, and magneto. The next signs are the conventional plus and minus symbols and are employed to designate the polarity of the current or direction in which it is flowing, the plus or positive terminal usually being understood as the point at which the current issues from its source, and the minus or negative that through which it returns, completing the circuit. These signs are of particular importance in connection with the use of storage batteries which must always be recharged in the same direction. The sign D is a conventional representation of a switch shown both in the closed and open positions, reading from left to right, while the next sign, E, represents an induction coil, the thick lines being the heavy or primary winding of the coil and the fine lines, the secondary winding. In the second line of symbols, F represents a ground connection already explained, G is what is known as a three-way switch, the only difference between this and the symbol already shown being the greater number of contact points which may be multiplied indefinitely according to the number of circuits the switch is intended to control; the use of this form of switch is made clear further along. In order that the spark may occur in the cylinder at a certain time, it is customary to insert what is known as a contact maker in the circuit; as used on single-cylinder motors and in magnetos, this is represented by the sign H; in multi-cylinder engines a more complicated form of timer is employed, this being represented in the case of two and four-

cylinder engines by the signs I and J, the only difference lying in the number of contacts, from each of which a wire is led to the spark plugs. In the case of a distributor, which may best be described as a sort of duplicate timer, half of which times the primary or battery current and the other half of which distributes the secondary or high-tension current to the plugs synchronously with the working of the timer, the same sign as J will be employed, except that eight instead of four connections are shown.

Wiring of Simple Forms of Circuits.

The signification of the term circuit as well as the various ways in which it is employed have already been explained at some length. In the series of sketches appended, an attempt has been made to show the meaning of these terms diagrammatically. For instance, Fig. 1 illustrates the wiring of an ordinary single-cylinder motor, the timer being omitted; in this sketch both the battery circuit to the coil and the high-tension circuit to the plug are closed. With the switch closed as shown there would be a continuous stream of sparks at the plug as long as the battery lasted. In Fig. 2 the switch has been opened and one of the wires broken, illustrating two means of making an open circuit; even though the switch were closed, no spark would occur at the plug owing to the break in the wire. The switch is shown closed in Fig. 3, but the broken end of the wire is presumed to have fallen on something providing a return path for the current. This is a short-circuit, and the path that the current would take in returning to the battery is indicated by the dotted line. From this it will be seen that there is a complete circuit so far as the battery is concerned, but the current does no useful work. These sketches have been prepared merely to illustrate the terms in question and do not represent actual methods of wiring. A closer approach to the latter is shown in Fig. 4; the timer, if shown, would be placed in the wire leading from the switch to the coil. This shows that one side of the battery, the positive in this case, has been grounded; the same thing has been done with one side of the primary winding of the coil. The current finds its way back to its source through the metal parts constituting the ground and thus the return wire shown in the previous sketches is done away with. One side of the secondary winding of the coil is also grounded and the same is done with the plug, the ground connection in the case of the latter consisting of the contact it makes with the engine by being screwed into the cylinder head, and is not a special wire as indicated by the drawing. This simplifies the wiring greatly by making but one wire necessary for each plug. In at least one instance extant a ground connection is not depended upon, two wires being used, but this is only carried out on one make of single-cylinder cars.

Various Forms of Connections.

The foregoing has dealt entirely with the varying character that may be given a circuit, whether by accident or design; but there are, in addition, other ways in which they may be changed. The word battery always represents a combination comprised of

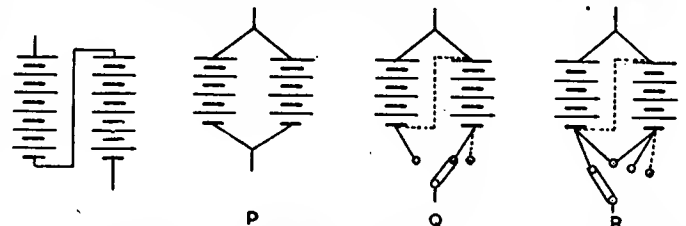


FIG. 8.—Diagrammatic representation of methods of connecting batteries usually employed.

several units, known as cells, which, in turn, are composed of elements, regardless of what type it may happen to be, such as primary or secondary, dry or wet, a secondary being more commonly known as an accumulator or storage battery. There is no necessity in the present connection to go into the matter of the chemical actions and reactions which produce the current

in a battery, but the distinction between a battery and a cell should be borne in mind, as well as the fact that each cell has a positive and a negative terminal. This is also true of every source of current. When dry cells are employed it is customary to use two sets, and the simpler forms of wiring will be explained with this in mind. When all the elements of the same nature are connected together, the cells are said to be in multiple and in this form the combined output in amperes is the sum of the individual capacities of the cells, while the voltage is that of but one cell. Referring to K, this represents six dry cells in multiple, and if it be assumed that the voltage of each cell is 1.5 and the amperage 10, the combined output would be 60 amperes at 1.5 volts. L represents the same six cells connected in series, alternate terminals being connected in every case, this giving the combined voltage of six cells with the amperage of one, which with the above figures would give a current of 10 amperes at 9 volts. The next diagram M shows the two sets of dry cells generally employed connected in a combination of these two forms of wiring known as series-multiple or series-parallel, which mean the same thing; that is, each set of six is connected in series so far as its cells are connected and each set is taken as a unit and connected in multiple, the combined output then being a current of 20 amperes at 9 volts; the last of these figures, N, represents both sets in series, giving an output of 10 amperes at 18 volts. As the voltage of a dry cell drops rapidly in use, especially when old, this is sometimes resorted to with a battery that is practically exhausted and will sometimes suffice to run the motor for a few hours longer.

The next series of illustrations is practically a repetition of those just described, using the conventional symbols, although there is shown in addition the method of wiring usually employed to effect the different combinations referred to by means of a multiple point switch. O represents the two sets of cells in series as in N, while P shows them in series-multiple as in M. Cells are never used for ignition purposes in simple multiples, as shown at K, owing to the low voltage. At Q is shown the wiring necessary to use either of two sets of dry cells or both in series, and at R the number of combinations is increased by the use of a four-way switch permitting either set to be used independently, both sets in series-multiple or both sets in series, the connections necessary for series use being indicated by the dotted lines in both Q and R. Sources of current will be considered in the next part of the present article.

LUBRICANTS FOR ALLOY BEARINGS.

It has been stated that any kind of grease or oil may be used with the Babbitt's mixture already given, but when this is softened down with lead, or with any alloy having zinc and lead in its composition, care should be exercised in the selection of the oil used to lubricate it, as such selection forms a considerable factor in the life of the bearing, says A. A. Suggate in a treatise on bearing alloys. It is often a question of some importance in designing the commoner class of machinery—say, agricultural or coal elevating, for instance—whether to put in high-price bearings, for which any kind of cheap lubricant may be used, or bearings at a less cost, yet, to be equally as efficient in the matter of wearing as long, would necessitate the use of a lubricant costing twice to three times as much as the lubricant necessary in the higher-price bearings.

MONEL IS SAID TO RIVAL NICKEL.

A new metal, called monel, is being produced at the works of the Canadian Copper Company, at Sudbury. It is cheaper than nickel, and it is claimed that it possesses all the qualities of the former. Monel is a compound of copper, nickel, iron, and one or two other minerals which are found in the district, and its importance lies in the fact that it is much cheaper than nickel, it is less liable to rust, and will serve all the purposes for which nickel is at present used. The new alloy is said to be of equal ductile strength with nickel, and to possess all its other essential qualities, which should give it a high value.

AMERICA LEADS IN NUMERICAL VALUE.

In numerical value the United States is at the head of the automobile producing nations of the world. Starting last, with but 314 cars in 1902, four years later, in 1906, the numbers had reached the formidable total of 60,000. In 1898 Germany had a slight lead on England, but soon lost it, and for the last nine years has followed in the wake of her industrial rival. Belgium did not figure with any prominence in the automobile industry until the year 1900; her increase was at first slow, but during the last two years she has made enormous progress. Italy was a still later arrival, and a very modest one at the outset. In 1901 she produced 300 cars; the following year the number was only very slightly increased, but for the last four years her numerical growth has only been eclipsed by that of the United States. Italy, however, has always produced high grade cars, and her real position in the automobile world is not revealed by figures on numerical output. The following table, compiled by the French authority, *La Finance Automobile*, shows the number of automobiles constructed in France, England, Germany, Belgium, Italy, and the United States from 1898 to 1906.

Year.	France.	England.	Germany.	Belgium.	Italy.	U. S. A.
1898.....	1,631	682	894	...	...	...
1899.....	4,914	1,143	1,478	...	...	...
1900.....	10,039	2,481	2,312	400	...	...
1901.....	16,486	4,112	3,209	600	300	...
1902.....	23,711	6,253	4,738	1,700	350	314
1903.....	30,204	9,437	6,904	2,839	1,308	2,722
1904.....	37,322	14,170	11,370	5,026	3,080	11,374
1905.....	47,302	20,848	15,682	7,927	8,870	23,877
1906.....	55,000	28,000	21,000	12,000	19,000	60,000

SPRING WHEELS FEASIBLE ON PAPER.

FROM THE AMERICAN MACHINIST.

An indiarubber tire becomes very hot when at work. The kneading to which it is subjected produces internal friction within the body of the material, and the tire will frequently become hot to the point of bubbling or smoking. On paper it is a very easy matter to design a steel wheel with internal springs that will work with perfect satisfaction—again on paper. This problem of the spring wheel is one of many years' standing with the makers of heavy traction engines. Many spring wheels have been invented, numbers of them have been tried. All, or nearly all, have failed. A steel spring has only a limited life; it will only bear, before breaking, a certain limited number of flexions. Some wheels, apparently of sound mechanical design, fail from dirt and grit. A spring composed of a block of indiarubber inclosed in a supporting metal cylinder might be expected to endure. But indiarubber has its limits even when thus supported. The whole problem, in fact, bristles with difficulties. It is urged that all these difficulties would be eliminated by the use of a perfect road surface, on which truly circular wheels of steel would run without shock.

IMMENSITY OF RECENT BERLIN SHOW.

Consul-General A. W. Thackara, reporting on the recent international automobile exhibition at Berlin, states that there were 980 distinct exhibits shown by 371 firms, companies and individual manufacturers, as compared with 320 exhibits and 298 firms in the exposition of February, 1905. Of the exhibitors 338 were German, 17 French, 5 Italian, 4 English, 3 American, 2 Belgian and 2 Swiss. This classification designates only the nationality of the direct exhibitors and does not explain the large number of exhibits, such as machinery, automobile parts and accessories made in other countries and exhibited by German firms acting as agents for the sale of such products in Germany. For example, Schuchardt & Schutte, of Berlin, exhibited a fine collection of American lathes, drill presses, milling machines, etc., for making special parts of automobiles. The machines came from Cleveland, Cincinnati, Waynesboro, Newark, etc., and, being largely automatic and exhibited in operation, formed a display which attracted absorbing interest.

TO ATTAIN ACCESSIBILITY AND CLEANLINESS*

By F. L. MARTINEAU.

IN tackling a paper on this subject I have endeavored to put before you the ideal to be aimed at, and to indicate how this ideal may, in some degree, be attained. During the preparation of the paper, certain points cropped up which more or less bear on the subject, such as the number of cylinders to be used, but these I have eliminated entirely from the subject matter of the paper. I have tried to consider each item from the standpoint both of the vertical and horizontal engined car.

As regards the two points in the title "Accessibility and Cleanliness," they are so intimately connected the one with the other that I have had to consider them together.

To begin with the ideal of cleanliness, it is, I think, that the whole exterior of the car should be smooth and easy to clean; that no mud or dust should be thrown by the wheels on to any part of the mechanism, or the carriage body; that all working parts should be thoroughly protected from grit; and that all oil drippings should be caught in a detachable receptacle.

Many Things to Be Considered.

The great question on which the whole problem of accessibility hinges is this: Why is it needful to be able to get at any parts of the mechanism? If it were not, the matter of cleanliness would be an easy one, as one could seal the whole mechanism up like sardines in oil and let it look after itself and yet always keep the exterior spick and span. Under these circumstances it would necessitate the designer so proportioning the various parts of the car that nothing ever wanted adjusting or replacing, and the end of the car would be like the one-horse shay, which collapsed into nothingness after its period of life was fulfilled. Unfortunately, it is impossible so to foresee the very varied conditions of working and the attention, or rather, the lack of it, bestowed upon our productions that they will wear out evenly, nor is it possible to provide against accidental breakages.

This being so, it may be necessary to remove or adjust any part, and so to obtain the ideal of accessibility, we may lay it down as an axiom "that we ought to be able to remove any one part without disturbing any other." This ideal, like all ideals, is practically impossible of attainment; to approach within reasonable distance of it would necessitate every part being exposed and in view, which would prevent obtaining efficient means of protection. The best we can do, therefore, is to study the easy removal of those parts liable to wear and use as a foundation on which to build up these parts all pieces not so liable.

The very first thing to consider, therefore, is the general scheme of the whole car, and in this the body is the item of greatest importance. What is the use of having an engine nicely housed in a bonnet in front, easily opened and inspected, if the gear box and other vital parts are made inaccessible by the carriage body, as on a car I found stranded by the roadside the other day. In this one of the gear wheels was pushed into mesh by a fork which, having got strained, refused to work; it was almost impossible to do anything to it, as the carriage body was in the way of the cover of the gear box. The body, undoubtedly, should be easily raised or moved so that all running gear can be easily and efficiently inspected.

Placing of Body a Strong Factor.

Now, the position of the body depends principally upon the permissible wheel base. What is the maximum wheel base which is easily handled and utilized in all districts? I have come to the conclusion that nine feet is the maximum, and I derive this figure from experience of cars of various wheelbase on the roads around my home in Devonshire. Having the size of a suitable

body, we can ascertain the available space for engine, etc. Take a landaulette body, the type most in vogue. This to be really comfortable must have a total length from dash to back of 108 inches, which is the same as the wheel base.

As it should not project behind the center of the rear wheels to give absolute comfort to the passengers on the back seats, the dash will come level with the center of the front wheels. This does not give enough room for an engine of the accepted vertical type; it is thus imperative to adopt some other position for the engine or curtail the seating accommodation. If the engine is a vertical one it can be placed in a bonnet between the driver and passenger in front, or it can be arranged under the driver's seat. Another way out of the difficulty is to utilize a horizontal engine.

Other Parts Besides Engine Need Attention.

To render every part accessible the body can be made to rise on hinges at the back, which done, the whole of the running gear, and not merely the engine, is at hand and in view. Should not the gear-box, etc., be cleaned and inspected just as often as the engine? To inspect the engine and gear-box separately the front and back floor boards can be removed, the former for the engine and the latter for the gear. As to the removal of the floor boards for inspection purposes, if these are made to lift out there is a greater liability of the mud and dust collected on them being emptied on to the parts below. I am, therefore, making them to slide out of the way under the seats and yet arranging them so that they lift up with the body.

As a general practice, it may be laid down that the whole of the chassis should be erected, and every part should be accessible from above. The true meaning of this is that with a car so designed a pit is no longer a necessity, and also that the most perfect cleanliness can be arranged for, as the undershield can be made absolutely continuous and permanent.

The number of sizes of nuts used in a car should be reduced to a minimum. I am now using only five sizes on the whole car, which means that the total number of spanners necessary to undo any nut is greatly reduced. To deal with any nut will require only three tubular box spanners.

Of the spanners which I have mentioned as necessary for my car, the jet spanner is the smallest, and this is now being made to fit all nuts on the ignition parts. All screws on the carburetor, etc., are also being made with hexagon heads to fit this spanner as well as a screwdriver slot.

The other method employed of locking nuts is the other point I mentioned.

An American Motor as a "Horrible Example."

An example of the indiscriminate use of nuts came before my notice some months ago in an engine which, originally of American design, was being brought up to English practice so as to be placed on the market here. The only way of describing it is by saying that it looked just as if a bucketful of odd sizes of bolts and nuts had been poured on to it, and that they had been fitted where they fell. To take any part off required about five spanners and a screwdriver. This state of affairs, I am pleased to say, has now been remedied.

In the consideration of the position of nuts and bolts it is general practice to arrange them through a boss; this in nine cases out of ten projects outside the case or whatever part it belongs to. It is also common to find gear cases and engine cases shaped so as to fit close to the gears inside. When a case is so arranged it may be very nice designing, but it always appears to me that if it were smoother and flatter outside, the bosses being arranged as much as possible inside, the weight would not be very much, if at all, increased; it would be much more easily

* Paper read at meeting, Institution Mechanical Engineers, St. James Park, London, January 16, 1907.

cleaned, and it would simplify the patternmaking, and in all probability cheapen the moulding, and, perhaps, make the holding of the piece in its jig for machining much easier. The most important point about having cases smooth outside is so that, in the event of anything requiring to be done inside, the outside may be made absolutely clean before it is dismantled. Under these circumstances, grit will not find its way into the interior when the parts are in the hand of the repairer.

Accessibility of Engine Details Paramount.

We now come to detail design, and will consider the engine first.

If this is of the vertical type, many difficulties exist which may not appear at first sight. To comply with our axiom it should be possible to withdraw a piston without disturbing any other part. To do this necessitates a very large hole in the side of the crank case, or else it must be done from underneath, which is generally very inconvenient. If it is arranged to be taken out at the side, to make it really convenient the engine must be fitted very high up in the frame—so high, in fact, that the fly-wheel and other parts will more or less interfere with the carriage body. Of course, if there is a hand hole in the crank case sufficiently large to take down the big end easily, it is possible to remove a piston by dismounting a cylinder. This method, however, is crude and unpractical in most engines by reason of the number of joints to be broken, and it does not at all fall in with the axiom with which we started. On a horizontal engine it is possible to make the whole of the top side of the crank case to come off without impairing its strength, and then the whole of the crank shaft, connecting-rods, and pistons are in view.

As to the cylinders themselves, there seems to be at the present time a great wave in favor of casting them all together. This may be good from a constructive point of view, but it is not so from the point of view of accessibility and repair. It has one advantage in its favor, and that is, it enables the whole of the valve stems and springs to be encased. The question is whether this is necessary. As long as we encase the engine in a nice bonnet and under shield, and then pump air laden with dust and mud through the radiator and over the engine it will be necessary. Should we not rather seal the engine up and pump the air from the radiator around and out at the back of the car? This would tend to keep the exterior of the engine cleaner, and allow of a large amount of casting at present fitted on the engines being dispensed with, and fitted instead as a casing for the grit-laden air to pass through. Reverting to the cylinders, in the whole of my experience I have never had to replace a cylinder because it was worn out; but still, I advocate casting them separate.

Cylinder and Manifold Removals Considered.

To my mind, a cylinder should be easily detached without removing even an inlet, water, or exhaust pipe, but only breaking the joints. The valves on most engines nowadays are easily removable, but it should not be necessary, in removing them, to have to take off the spring. This should be arranged to be supported whilst the valve is withdrawn and ground in. At the same time, a valve spring itself should be easily replaceable in case of breakage. Another part which is usually rather difficult to get at is the gudgeon pin. In most cases this is fixed by two taper-pointed screws. As these require very carefully locking with nuts, and are very close up to the side of the piston, they are practically only removable with special tools. At the same time, they have the disadvantage of causing the piston to become oval when hot, as the expansion of the piston and gudgeon pins are slightly at variance. To obviate this, as long ago as 1899 I fixed the gudgeon pin in the small end of the connecting-rod by a taper pin, driven through on the side away from the big end.

Positions of Ignition and Carburetion Details.

The ignition distributor or commutator should be arranged so as to be easily taken apart and cleaned. This I have managed by making the rotating center spindle and contact cam withdraw out of its bearing, leaving the whole interior free for cleaning; the

end of the spindle is driven by a dog clutch so that it can only be fitted in its right position. The camshaft should be made to come away sideways; when made to withdraw from one end it often necessitates the taking down of some other part. It is better to my mind if arranged so as to be inspected by simply taking off a cover.

The carbureter is a part of the anatomy of a petrol engine that has received an enormous amount of attention in the last few years, but I am sorry to see that the tendency has always been to add parts, and not to eliminate them. Some of the later types may or may not be more efficient than their predecessors, but they certainly are not more accessible. It is impossible in most of them to ascertain if the petrol stands at the correct height in the float-box, for the simple reason that the float valve has its gear on or is guided by the cover. Why should it not be made independent of the cover? Similar contrivances for other purposes have been in use for years, and are always made accessible, yet a carbureter, which depends on the accuracy of this adjustment, in a great measure is incapable of correct adjustment. The design which I now use has the float on one end of a lever, the other end of which presses on a horizontally arranged needle valve. In this way the needle valve and its seat can be withdrawn together by undoing the petrol pipe union, and the petrol level can be observed and checked with the top of the float-box off. The float, too, can be easily removed.

Necessity for Dust and Water-Proof Shields.

In many cases the exhaust pipes will be found on a car wrapped up with asbestos; instead, they should be carried out of the way. It is essential to have an under shield completely enclosing the engine; it should be quite tight-fitting, and if it is necessary to have a hand hole in it, the hole should be large enough to work through and a good three-eighths bead carried around it.

Before we finally leave the engine, there is one other part I must mention, and that is the adjustment usually fitted on the coil trembler. This, as a rule, is a screw with a milled head passing through a bridge piece, and a hexagon lock nut to fix it after adjustment. This nut nearly always requires a special thin spanner, as the space between the milled head and the bridge is not sufficient for one of ordinary thickness, and it has the further disadvantage that the locking of the nut by pulling the screw up into the threads disturbs the adjustment. A much more accessible way of doing this is by splitting the bridge vertically throughout its length, and fitting a screw through, coupling the two halves, and so clamping the adjusting screw.

Getting at Change Speed Gears and Drives.

We now come to the clutch and gear box. In the majority of cars at the show at Olympia these two parts seemed to have received the greatest amount of attention to make them individually accessible. Whether they were so collectively with the carriage body mounted seemed to be to a very large extent left to the tender mercies of the carriage builder. Given that the carriage body is not in the way, there is very little to note with regard to either of these parts, as they can be made so easily dismantled. We now come to the back axle, and the more I go into this the more there is to say. So many different types are in use, and each must be considered separately, that I think it better only to mention a few points to be considered. The chief features which have to be retained in view are these: Either wheel should be easily removable. The differential should be accessible. It should be possible to correct the adjustment of the drive, be it bevel, chain, or worm, and the brakes should be easily adjusted, and their adjustment should not require altering to remove a wheel. From the point of view of cleanliness, if chain drive is used, the chains should be encased if outside, or else the under shield should be so prolonged and shaped to protect them.

As regards the steering, this is usually arranged so that the various connecting-rods are outside the under shield, and the joint ends protected with leather covers. I prefer making all the connections inside as much as possible, and have designed the joints so that they are dust-proof.

LETTERS INTERESTING AND INSTRUCTIVE

Increasing an Engine's Horsepower.

Editor THE AUTOMOBILE:

[579.]—Will you inform me how I can get more power from a four-cylinder motor without increasing the size of it? The bore is 4 inches, and the stroke 4 1-2 inches, while the compression is very low. The motor can be run any length of time on any gear without overheating. It is my idea to lengthen the connecting rod slightly, with a view to securing more compression, as the motor is water-cooled. It seems to me that the change should be O. K., unless the valves would have to be changed, which would be impossible. Would you advise my making any changes, and if so what would you suggest?

H. T. G.

Waterbury, Conn.

If you are very sure that the compression is low, and are willing to take a small chance of rendering the motor more likely to overheat, an increase in the compression will increase the power. And if the water-cooling system is well designed there should be no very serious danger of overheating. Your idea of lengthening the connecting rods to secure the desired increase in compression does not particularly appeal to us, as it seems likely to involve you in other difficulties. It will, in the first place, cause the pistons to travel higher than they are designed to travel, with the result that they may overrun the counterbored ends to the wearing surfaces nowadays provided for in the design of practically all high-grade engines. Besides this, it may cause the connecting rods to strike the sides of the cylinder ends, if the clearance at these points is figured as close as is not infrequently the case. A much better plan would seem to be that of partially filling the combustion spaces by screwing plates against the insides of the cylinder heads. Sometimes such plates are attached to the pistons, but the objection to this is that they increase the weight of these rapidly-reciprocating parts. We hardly feel inclined to advise any very extensive changes, especially without knowing the make of the motor, so that we can have some idea of how good it is in its present condition, but a little experimenting in the way of filling up the combustion chamber in the manner suggested hardly can do any harm. If there is any possibility of the valves being too small—a not uncommon fault with many early engines—changes in other details are not likely to help matters materially. Sometimes, with an engine of definitely poor design, amplification of the inlet piping proportions, or a change in muffler or carbureter, will effect a very marked increase in power.

A Correspondent Takes an Exception.

Editor THE AUTOMOBILE:

[580.]—In reference to letter of Clarence T. Jones, published in your paper as number 543, I would like to say that I thoroughly agree with Mr. Jones, and consider that he has in his letter given a very excellent idea of battery consumption in connection with a timer and vibrator and, although I do not know him, I consider him a man who thinks. I will also say that the idea that you are giving by the answer to his letter is entirely wrong, and I base my statement on actual experiments performed. I am sure that you will be able to confirm Mr. Jones' statement as correct by reference to any reputable manufacturer of spark coils.

Chicago, Ill.

FREDERICK K. ARTHUR.

As you make the sweeping statement that our answer to Mr. Jones' letter (Number 543, January 24, 1907) is *entirely* wrong, we take it that this means that every statement made therein is erroneous. We are anxious to be set right and have no doubt that Mr. Jones would also appreciate further light on the subject. Accordingly, we should like to hear from you more definitely, taking up our answer point by point and demonstrating wherein it is not correct, particularly with regard to the experiments you mention having made. We should be pleased to learn the data you have been able to collect on this point by reason of your experience, as well as from the tests you have made.

Official Rating of Motors in Germany.

Editor THE AUTOMOBILE:

[581.]—In your issue of January 31, 1907, page 233, under the head of "German Motors Officially Rated," you give a formula for horsepower rating: N equals $.3 I D^2 S$, in which all the terms are metric and based on 900 r.p.m., with a mean pressure of 3.8 K-g. per square C-m., or 54 pounds per square inch. I believe this formula is incorrect as above printed. Are the cylinder and stroke expressed in millimeters, as is usually the case; if not, in what terms? Kindly explain by a concrete example with a four-cylinder Packard 5 x 5 1-2, and state the facts in horsepower, either in French or English terms.

E. J. COOK.

Cleveland, O.

The item you refer to in your letter was taken from a foreign exchange verbatim. We presume that as it is stated therein that all dimensions are metric, the bore and stroke are expressed in millimeters as you surmise, but cannot throw any light on the question. Nor can we say whether the formula is correct as set forth there or not. As a matter of fact, this phase of the question was not given any consideration in connection with the insertion of the item, but upon referring to it again cannot recall that we have ever seen a horsepower formula expressed in exactly that way. It is possible that it may have suffered in the translation. Not being sufficiently familiar with it we cannot accede to your last request, but if you wish to point out the error as it appears to you, giving a concrete instance from American practise such as you mention, we will be pleased to hear from you.

A Loose Steering Wheel and Some Other Questions.

Editor THE AUTOMOBILE:

[582.]—Will you kindly answer the following through the columns of your journal? (1) The steering wheel on our automobile is quite loose, having considerable play, so that it requires a movement of four or five inches before the wheels commence to turn. We have been informed that this is proper, but would like to have you tell us if it should be that way. (2) Would you please explain the proper way to connect up the circulation system on a two-cylinder opposed motor. There is a tank on top of radiator, and the pump is located between the motor and radiator. Should the cold water enter the top or bottom of cylinders? (3) What is the cause of a motor running fast and then slow, then gaining speed again without advancing spark or opening throttle? (4) We have had trouble from flashes of fire coming from carbureter when motor is running. This would occur when motor was running unsteadily, as suggested in question 3. The flashes would appear the same as a large spark, and would occur about every half-minute. Can you give us the cause of this?

Boyer City, Mich.

WENZEL BROTHERS & CO.

The steering wheel should not be as loose as you say it is, though it is less harmful to have it so than is commonly imagined. If the steering gear is of the irreversible type, as we assume is the case, the road wheels are rigidly locked in any position, irrespective of the movement permitted the steering wheel. Of course, with an inexperienced operator, or in any case at high speeds, the amount of manipulation required to start the change in direction might prove awkward, and thus cause an accident. It is practically impossible to make an irreversible steering device without some lost motion, because a very small movement in the gear itself will permit the wheel to move considerably. Most irreversible steering gears are of the worm-and-sector or the screw-and-nut type, and in many cases of the former they are not provided with any ready means of readjustment to take out wear. If the gear on your car is adjustable, you should adjust it; if not, it will be necessary to replace the worn parts. It is just possible that the looseness may be in the connecting-rod or drag-link joints, in which case there is no excuse for its existence, besides which it is apt to be materially more dangerous than lost motion from the other cause. Concerning the circulating system for the two-cylinder motor, it is impossible to

lay down any definite plan that will apply invariably, the variety of systems being almost as great as the variety of engines. As a general rule, however, the cold water should enter the bottom of the cylinders, preferably beneath the exhaust valves, so that it will exercise the maximum cooling effect at the hottest point of the motor and rise through the waterjackets through thermosyphon action as it is heated. The water should enter the top of the radiator, so that it will pass down as it is cooled, and the pump certainly should be located between the bottom of the radiator and the inlet to the waterjackets, for the simple reason that it is easier to pump cool water than hot. A motor that runs fast and then slow, fluctuating without spark movement or throttle manipulation may be suffering from an obstructed lead into the carbureter float chamber, so that the float chamber fills up slowly, permitting the motor to run under full power until the chamber is emptied again. The backfiring into the carbureter is due either to wrong timing of the valves, so that the inlets open before the exhaust, or else it is due to pitted valve seats, making tight closure impossible.

Lighting the Lamps by Electricity.

Editor THE AUTOMOBILE:

[583.]—Will you kindly describe in your columns how I can ignite the gas in my headlight by pressing a button near the gas generator, to save the inconvenience of getting out of machine to light up? They tell me one needs a coil, etc. Why can't I use the battery and coil plant I have on my auto for this purpose? I am a subscriber to your valuable journal.
W. L. K.
Pittston, Pa.

There is no reason why the headlights cannot be lighted without the necessity of using another coil, or for that matter without any coil, though the latter would probably not be found very practical. It would involve the use of a very fine piece of platinum wire placed across the tips of the burners, so that the gas would come in contact with it. The ordinary six-volt accumulator as used for ignition purposes will doubtless be found sufficient to bring a half inch or one-inch piece of platinum wire of about twenty-eight or thirty B. & S. gauge to incandescence, which will ignite the acetylene. A better way would be to cause the secondary current from one of the induction coils on the dash to leap a gap in the path of the gas from the burners; by connecting the gap in each headlight in series both could be lighted at once. Or, again, something on the style of what is known as an automatic gas-lighting burner could be employed; that is, one using an electromagnet to vibrate an armature, making and breaking contact and producing a spark in the path of the gas; this does not require an induction coil. In any case, there would be no necessity for a separate battery or coil where it is desired to use the latter, which would be by far the simplest method.

Some Interesting Dry-Cell Problems.

Editor THE AUTOMOBILE:

[584.]—One of my cars, a four-cylinder, air-cooled, came from the factory equipped with a battery of twenty No. 6 Columbia dry cells, wired according to a diagram sent with them, and showing the cells ranged in four rows of five in a row. Of course the cells were wedged tightly in place in the box. According to the makers of the car, this battery should have given the voltage of five cells and the amperage of ten on either side of the switch of the Splittdorf coil. I have found the dry cells used in this way very irregular, though I carefully test each new cell and always see that the sets are correctly wired. One lot will last for 500 or 600 miles, while the next, of the same amperage, will run out within a third of the distance. A neighbor of mine, who has a single-cylinder stationary gasoline engine, which he uses to saw cord wood, told me recently that at first he used No. 6 cells—in sets of eight, I think. He found them very unsatisfactory and short-lived, and now is using four very much larger dry cells. He declares that a set of the latter will last me nearly a year. Do you think I would get better service by using larger dry cells, and, if so, how many should I use? Do you think I am using too many of the No. 6? I will admit that those I use do pit or

corrode the platinum points of the tremblers very frequently. I tried a storage battery, out of which the makers said I would get at least 700 miles on a charge. As it petered out in exactly 75 miles, I went back to dry cells.
C. F. M. STARK.
Concord, N. H.

From the sketch you submit it appears that one of your sets of five cells is not connected in the circuits at all, so that on one side of the switch you get the voltage of five and the amperage of ten cells and on the other side get the voltage of five and the amperage of five cells. This, however, may be an error in your diagram, and in any case cannot have much to do with the troubles you describe. Judging from the lack of any invariable result, it would seem that something might be wrong with the wiring system, possibly a short circuit that sometimes causes the cells to run down rapidly. We assume, of course, that the switch is in good order and that you always switch off the current when you stop the motor. Stopping by the throttle, without cutting off the ignition, is a practise sometimes indulged in by the inexperienced, and if the engine happens to stop with the commutator making a contact the current supply will be run down very rapidly. The voltage of five cells is rather high for the ordinary coil, and eight cells, as used by your friend, if connected in series would quickly ruin the coils of most ignition systems, besides sending through enough current to pit the contact points. The advantage of large cells is that they have large current capacity without any higher voltage than smaller cells, so the use of four large cells might prove very successful. If the storage battery you use was discharged in traveling seventy-five miles, there was something too radically wrong for reasonable existence as a defect in a storage battery of even the poorest quality. In fact, your experience in this direction rather bears out the theory of some sort of a short circuit.

A Twenty-five Per Cent. Grade About the Limit.

Editor THE AUTOMOBILE:

[585.]—Will you kindly let me know what is the steepest grade an automobile can climb; also what is the grade percentage of the following hills: Fort Lee Hill, Eagle Rock and Jacob's Ladder?
Stamford, Conn.
SUBSCRIBER.

To our knowledge there is no data extant as to the steepest grade that an automobile can propel itself up, and, as a matter of fact, this depends so very largely on surface conditions that no general statement regarding it could be of value, for it must be evident that the vehicle's power to move forward on an incline is not limited by the angle of the latter alone, but by the hold the driving wheels are able to get of the road. Bearing in mind the fact that a 45 per cent. grade represents a vertical line, it is easy to see that no matter how much power can be concentrated at the rear wheels, a point is reached on grades ranging from 25 per cent. upward, where the force of gravity becomes superior to the maximum tractive effort. The average car has more than sufficient power to lift itself vertically at a fair rate of speed, if positive means for doing this, such as a drum and cable, were provided, so that it is not so much a question of horsepower as it is of holding power. To the average man a 25 per cent. grade appears to be a perilous approach to the perpendicular. Apart from mountain trails, there are probably few, if any, traveled roads in this country having such a grade. The possibilities of the automobile as a hill climber have been most surprisingly demonstrated in its ability, and remarkable climbs up wooden inclines have also been made to mount long flights of stairs. There is no definite data available as to the grade percentages of the hills you mention. Fort Lee Hill rises something like 300 feet in a little more than half a mile, or putting it roughly, one in nine, which gives it an average grade of 10 to 11 per cent. Eagle Rock is considered to range from about 6 to 12 or 13 per cent., and the same is true of Jacob's Ladder, except that in the latter case, the surface is nothing like as good, which is an important difference.

Trouble From Unusual Location of Carbureter.

Editor THE AUTOMOBILE:

[586.]—I would like your opinion on the following: I have a light touring car containing a 16-horsepower, double-opposed motor. Bought it new August 27, 1906, and have always had more or less trouble with front cylinder; it has not as much power as rear cylinder, does not seem to burn the mixture thoroughly, emits black smoke, and soots spark plug so that it is necessary to clean it every three or four miles since it has been cold weather—it was not so bad during warm weather. The intake valves are on opposite sides of motor. It is about two feet from carbureter to front intake valve, where intake pipe divides within about six inches of front intake valve. The intake piping for rear cylinder extends from this division along side of motor and around the rear end to intake on opposite side. The rear intake pipe is about four feet long from division, as against six inches for front intake pipe.

The rear cylinder apparently works perfectly, and always has. So far as I can see the valves of front cylinder work and fit perfectly. I have transferred spark plug and wiring and coil from rear cylinder to front one, with no better results.

Do you think it is possible to get the proper mixture to both cylinders with such a difference in the length of intake pipes? It is my opinion that the front cylinder gets too rich a mixture, and that if I change the carbureter to that end, the rear one will get too weak a mixture. I am going to make the experiment as soon as weather will permit.

C. A. KINSEY.

Adrian, Minn.

Such an excessive difference in the distance of the two inlet valves from the carbureter, *i.e.*, six inches to the forward cylinder and four feet to the rear cylinder, would appear to be something that no amount of adjustment of the carbureter itself could possibly compensate for, and there seems to be little question but that it is responsible for the trouble you have experienced. With few, if any exceptions, it is customary with designers to make the inlet manifold of such a shape that the distance from the carbureter to each of the inlet valves will be approximately, if not exactly, equal, whether the engine have two or four cylinders. It is evident that if the carbureter be adjusted so as to produce a good mixture for the forward cylinder, the rear one will be starved, and if the latter be the one in view when making the adjustment the forward one will be choked, which seems to be the case. At least one well-known designer attempted to overcome this by the use of two independent carbureters placed directly at the inlet valves of the two-cylinder engine, but it was found difficult to synchronize them, and, after two years' use, the usual method of placing the carbureter equidistant between the two valves was adopted. We should be pleased to hear the outcome of your experiments.

Is Skidding Lessened by a Front Drive?

Editor THE AUTOMOBILE:

[587.]—Would a car driven through its front wheels be as liable to skid as one of ordinary design, both being operated under like circumstances?

Your articles on "The Question of Sideslip" in the issue of "The Automobile" for November 15 and 22 discussed the matter with regard to machines of ordinary construction, but I would like to know how these same forces would affect a car built on the plan of Christie's racer.

H. W. HAMMOND.

Ludington, Mich.

While there is no definite data available on the subject, we think it has been noticed that at ordinary speeds cars using a front drive are not given to skidding to the same extent as those of the ordinary type, when, by skidding, a slewing round of the rear half of the car in turning corners is meant. If, on the other hand, by skidding is meant that manifestation of centrifugal force that causes a whole car to travel sidewise, or, in other words, to attempt to continue traveling in the same direction when a curve is rounded at excessive speed, it is at least questionable whether the fact that the front or rear wheels are driven has any bearing on the matter. It is thought by those who have given the subject any attention that the matter of braking has a great deal to do with it; that if the front and rear wheels were retarded simultaneously the tendency to skid would be minimized. We have never seen the question treated at any length solely from the point of which pair of wheels was driven; the differential is an important factor.

Combination Air and Water Cooling of Motors.

Editor THE AUTOMOBILE:

[588.]—Is there now on the market a combination air and water-cooled motor? Kindly give objections to it, and also the advantages, if any. Could it be perfected, and is it worth while to attempt it?

A SUBSCRIBER.

Your idea amounts substantially to a simplification of the present systems of water cooling, since even with water cooling systems the real cooling is done by air, and the water simply serves as a means of conveying the heat units from the cylinder walls to the radiating surfaces. You eliminate, of course, the piping, the pump, etc., but largely offset these advantages by reducing the cooling surface unless you use an extraordinary large jacket. Also, the idea is not new, since the Dufaux cars, made in Switzerland, were made in one or two models of a year or so ago with small, "ear-like" honeycomb radiators built directly upon the cylinder jackets.

ANOTHER SOLUTION OF "550," WITH MANY "IFS."

Editor THE AUTOMOBILE:

[589.]—Relative to Letter No. 550, in the January 31 issue, by "Subscriber, Chicago, Ill.," I have no doubt the machine referred to has been made by the Maxwell-Briscoe Co., Tarrytown, N. Y. If "Subscriber" is absolutely certain there is a positive contact on each pole of the commutator consecutively at the same point on the perimeter of the flywheel, and that the brushes have an equal pressure on the cam—no guessing—that the air adjustment gives all the air necessary; that the needle valve is not open two and one-half turns, when one-quarter turn is all he needs to run the engine, that the carbureter is not half full of mud and water; that he has taken the spark plugs supplied by the factory and thrown them into the nearest river, or placed them in the furnace to help heat his home; that the plugs he now uses are not worse than the others—are perfectly clean, not smeared with oil or carbon; that they fire on the points, not in the chamber; that his secondary wires do not short-circuit on the frame or hood; that his commutator wires are not broken and make an occasional contact as vibration impels them; that he has gasoline in his gas tank, not in the condenser; that all his connections are tight; that his valve plugs, relief cocks, spark plugs, etc., do not lose all his compressed gas on both or one cylinder; that there are no holes in his inlet pipe, or a pound of waste on the valve seats, causing the valves to leak or remain open; that his valve springs are not weak or broken; that the pins holding the cams in position on the camshaft are not broken or loosened and dropped out, causing the valves not to open and close at the right moment; that the valve stems are of equal length with regard to their release by the tappet rods; *i.e.*, that the valves of one cylinder do not open sooner and remain open longer than those of the opposing cylinder. Assuming the above to be O. K., I would say look to your coil; you will find a stiff or rigid armature on one unit, a flexible armature on the other, possibly the contact points burned away on one or both. It is like throwing good money after bad to send to the factory for two armatures of equal flexibility. They don't know the difference between "hard" and "soft," or "rigid" and "flexible." Take the coil and do with it as you did with the plugs; it will be the cheapest method in the end. I have had success with the Spiltdorf latest make, and also the Connecticut coils. I am not biased in favor of or against any of the above coils.

F. J. P. FITZGERALD.

Englewood, N. J.

IN SUPPORT OF THE HIGH-POWERED RUNABOUT.

Editor THE AUTOMOBILE:

[590.]—Unlike Demarest Lloyd, of Cambridge, Mass., I don't want to get mixed up in a controversy between two magazines covering the same field, and, on account of that position, more or less antagonistic. Over ten years' experience in newspaper work has, I think, taught me the futility of such contests. It is so in the newspaper field, and I'm sure Mr. Lloyd will find it no better in the realm of the magazine. I do, however, want to say my little say about this cry of "wolf" about the "high-powered runabout." What is really the matter with the runabout as made and sold by the manufacturer of almost every representative automobile to-day? It is not because they are in themselves infractions of rules of the road, rules of society, rules of symmetry, or any other which does not apply to any other high-powered machine. It cannot be that the only fault found with it is its excessive speed, for what car of note to-day is not capable of fracturing every speed law devised by legislatures? I have before me a small folder received from a manufacturer yesterday. It describes a 1907 product, and says "seats five, powerful, capable of from 21-2 to 60 miles on the high gear per hour." This with a regular body. Now, by converting this same chassis into one of the much-

despised (?) runabouts probably five more miles an hour could be secured, but is that so much greater a crime than the bare 60 miles, which in itself is three times the legal limit of speed in almost, if not all, the States? It is a question, if taking vibration, traction at the rear wheels, and smoothness in riding, whether the temptation to run 50 to 60 miles an hour, with five passengers, is not greater than to go a few miles faster with only "two up?" I think so.

For touring purposes, where only two people are concerned, as is the fact in my case and hundreds of others, there is nothing better than the runabout of high power. For then hills of the steepest nature and roads of the deepest sand can be negotiated at an unvarying speed. Whoever has tried to carry the necessary articles for the bare necessities on a trip in the tonneau and then used the "beetle-back" knows the difference. Those persons who are legitimate lovers of the sport, and not simply "speed fiends," need and desire just such a car, and because it looks like a racing car, should not outlaw it from the auto ranks. The great fault is not in the high power of the runabout any more than the high power of the touring car. It has its place—just as has the touring car, the limousine, the electric, and the commercial vehicle.

Middletown, Pa.

JOHN W. FEW, JR.

A METHOD OF COMPUTING COMPRESSION.

Editor THE AUTOMOBILE:

[591.]—Referring to letter No. 490, in issue of December 6, on "Compression Space and Compression Pressure," I herewith give my method of computing the same, since I note that you ask for the opinion of readers on different subjects.

First, let the compression required in pounds to the square inch, gage, equal CP. Second, assume the temperature of the cylinder volume in operation, or take the computed temperature of same, to equal Vt, when compressing. Third, regard as constants the range of 460 from vacuum to OF and the 0.002 increase in volume of pressure for each degree rise in temperature—14.7 pounds to the square inch equalling 1 atmosphere. Then,

x equals $(Vt \text{ plus } 460 \text{ times } 0.002 \text{ times } 14.7 \text{ minus } 14.7)$ equals x equals increase in pressure;

CP minus x equals y and y divided by 14.7 equals total volume to one volume of compression space,

v equals total volume. V equals volume compressed.

Example:

Vt equals 840 plus 450 equals 1300. X 0.002 equals 2.5 times 14.7 equals 38.22 minus 14.7 equals 23.52.

23.52 equals x , CP equals 65 pounds minus 23.52 equals 41.48 equals y equals compression pressure without heat of cylinder volume, y divided by 14.7 equals 2.822 equals v to 1 volume;

Therefore total volume equals 28.22 to compressed volume of 10.00

Compression pressure equals $\frac{v}{V} \times X \text{ times } 14.7$, not including heat, or

A equals atmospheres and A equals 1 atmosphere equals 14.7

P equals $\frac{a \ v}{v}$ and A equals $\frac{v}{V}$ and $\frac{v}{A}$ equals V as before

v equals total volume and V equals compressed volume.

Sixty-five pounds compression when the engine is in operation—or at time of explosion—equals a compression pressure of 41.48 pounds compression when not in operation, which is the basis of calculated compression space to obtain an equal compressure pressure of 65 pounds. I hope this is not too much in the way of figures on the compression problem.

Chicago, Ill.

R. C. MATLAC.

TWO-CYCLE MOTORS AND DAIMLER'S SUCCESS.

Editor THE AUTOMOBILE:

[592.]—C. P. Malcolm, in your February 7 issue, while commenting upon the troubles abounding in two-cycle motors as a type, puts forth the claim that the original Daimler motor was sent to this country to revolutionize the gas engine industry. Mr. Malcolm says: "The Daimler people found out that without real merit no amount of business ability, all of the push, all the pull that could be brought into use would not build up a reputation; would not make a great and permanent business success of a mechanical mediocrity of achievement." If Mr. Malcolm had been talking about two-cycle motors instead of the Daimler, then it would be possible to take some stock in his statement, but no amount of ill-conceived talk will ever be equal to the task of reducing the value of the Daimler achievement.

True, Daimler advanced, but the original Daimler motor was an advance, and the success of the Daimler project is more plain than Mr. Malcolm's failure to make two-cycle motors mote.

Whether or not the two-cycle motor will ultimately grow up and be somebody—so to speak—is quite another matter, a question, in fact, that will probably be settled along lines suggested by Mr.

Lougheed, i.e., "Improvements are not bound up in mere adaptations of present constructions and ill-advised applications."

In any case, no amount of effort to erase the work of Daimler will make the two-cycle project any more a success than it is. It is not the purpose here to decry the two-cycle motor; indeed, the writer is trying to make a success of it; but if failure results, it will not be the writer's plan to try to pull the Daimler effort down to the level of a two-cycle failure.

THOS. J. FAY.

Brooklyn, N. Y.

AUTOS A REASON FOR RIVER IMPROVEMENT.

Editor THE AUTOMOBILE:

[593.]—We have data to show that a larger number of autos in proportion to the population are used in and around Stockton than in any part of the West, and possibly than in any part of the United States where agriculture is the chief industry of the people. This is the natural result, for the great San Joaquin Valley, which at this point is over 40 miles wide, and stretches for over 300 miles southward, is so perfectly level that the automobile has become the vehicle of daily use for extensive journeys and for the expedition of business as well as for pleasure. In this county alone are over 1,200 miles of rural roadways which are daily traversed during seasonable weather by automobiles, many of which are owned by the prosperous farmers.

I mention this fact as introductory to the subject of developing this valley by an improvement of the San Joaquin river, which is the great natural highway of traffic that permits the producers of this region to cheaply reach the markets of the world. Any movement therefore to advance this development is directly in the interests of the automobile trade, and I call your attention to the illustrations and texts of the memorial adopted by the Stockton Chamber of Commerce, asking Congress for a survey of the river, with a view to its ultimate improvement.

Stockton, Cal.

J. M. EDDY,
Secretary, Chamber of Commerce.

A CASE EXACTLY IN POINT.

Editor THE AUTOMOBILE:

[594.]—Letter No. 550, signed "A Subscriber, Chicago, Ill.," in the issue of January 31, excites my sympathy, because I have had exactly the same trouble, and have cured it completely. I had a double-opposed cylinder runabout, which performed the exact tricks described by the correspondent mentioned above. I made up my mind that the trouble was either in the mixture or ignition, and doctored both as follows:

I got a larger auxiliary air valve for the carbureter (twice the opening of the old one), and I cut out just one-third of the voltage of my batteries by connecting them in multiple. One or the other of the improvements, or both, cured my trouble completely. My runabout has been about 1,500 miles since the change, without a stop or trick, while before it never ran 100 miles without trouble. I advise "Subscriber" to try dry batteries—starting with four ordinary Columbias, then trying five, which ought to be all right. After he determines the best voltage he can work his storage battery accordingly.

If this does not cure his trouble, I advise him to get the air through the carbureter quicker, either by changing carbureters, or by getting a large air valve made to fit his carbureter.

New York City.

STEADY READER.

A POINTER FOR "SUBSCRIBER"—No. 550.

Editor THE AUTOMOBILE:

[595.]—I have read over the letter of "Subscriber," No. 550, which is headed "A Trouble With Peculiar Symptoms," and also your answer thereto, and the only thing that strikes me as having been omitted from the latter is the fact that the cylinders of the engine on his car may have become carbonized, or the flywheel may have worked a bit loose, which would account for the pounding. I think if he will look over these two points and also reduce the range of movement of the timer, as you suggest, that he will not have any further difficulty from this cause.

Boston, Mass.

D. F. M.

THE SIMPLEST REMEDY FOR KNOCKING.

Editor THE AUTOMOBILE:

[596.]—I would like to venture an opinion in regard to letter No. 550, in which the writer complains of knocking when spark is even slightly advanced under load. The symptoms sound to me like a deposit of carbon in the cylinders. At least, the same troubles developed in a car of mine, and were cured by cleaning out the cylinders. This explanation sounds ridiculously simple, perhaps, but, in view of my almost identical experience and that of others, it seems plausible.

Cambridge, Mass.

PLAUSIBLE.



POWERFUL SIX-CYLINDER NATIONAL RUNABOUT WHOSE 75-HORSEPOWER ENGINE SHOULD MAKE IT A SPEED WONDER.

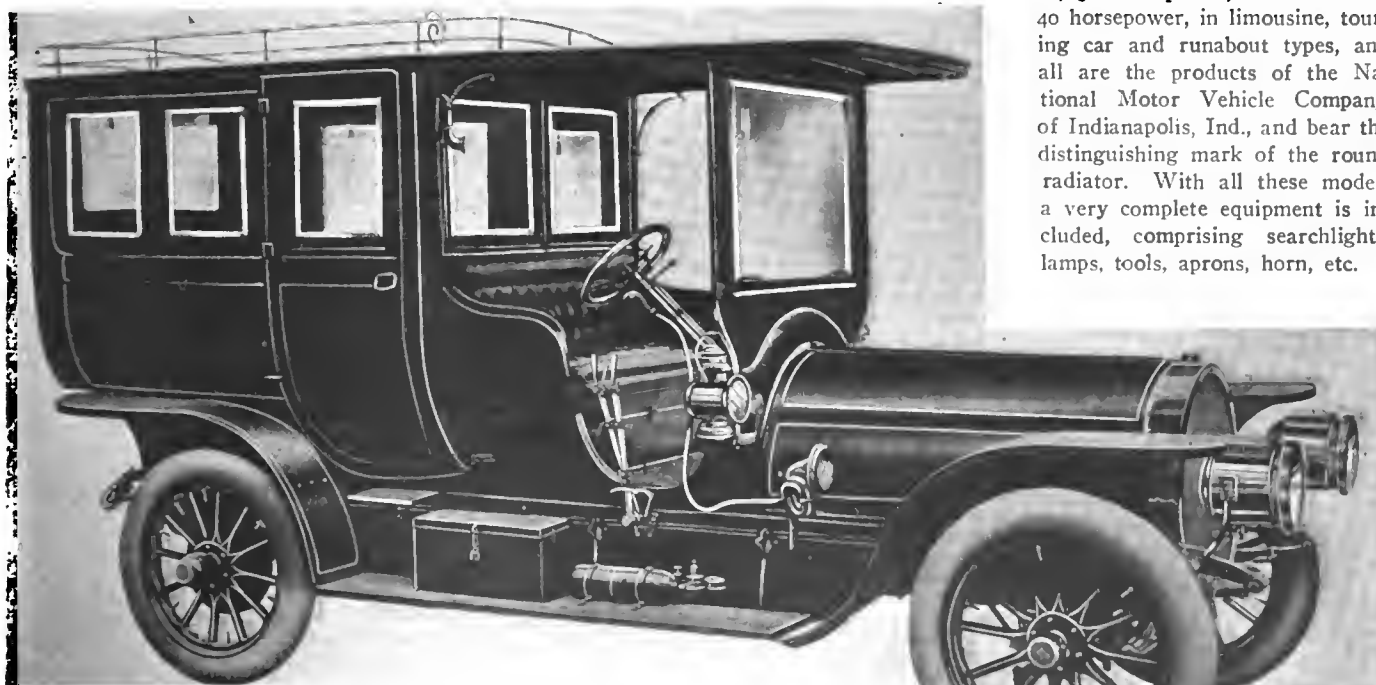
PROBABLY there is nothing that typifies speed and power so forcibly as the modern high-powered runabout, and this is very much heightened when the power plant is of the six-cylinder type, as is the case with the National 75-horsepower runabout illustrated at the head of this page, and which will form one of the strongest numbers in the National line of cars for the coming season. The colors in which the representative of this type exhibited at the recent Chicago show was finished made an attraction of it that the visitor could not overlook, regardless of whether he happened to take any particular interest in that type of vehicle or not. The body and fenders were painted an apple green with white striping, while the chassis was painted a bright red, set off in the same manner, the bucket seats being upholstered in leather of the same brilliant hue as the chassis. It was equipped with 36 by 4½ wheels and tires, the latter being Diamond flat treads, and was indeed an impressive example of the extent to which manufacturers have lent ear to the popular demand for this semi-racing type of two-seated vehicles.

In striking contrast with it was a nine-seated limousine body on the same type of six-cylinder chassis, so that so far as its power plant was concerned this car was a counterpart of the

racy-looking monster. Apart from this, however, the keynote of its construction and finish were to be found in everything that lent themselves to the comfort and luxury of the occupants. The body of this car was painted black, with the interior finished in mahogany and upholstered in black goatskin. The chassis was also painted black, giving the whole that appearance of staid dignity and respectability that is one of the chief attributes of this most luxurious of cars. Its seating capacity of nine adults is something quite unusual and on that account was the subject of not a little comment. Beside the two bucket seats in front, there is accommodation for seven people in the enclosed portion of the body. It is equipped with two revolving chairs, in addition to the regular limousine seats, and its fittings include besides the usual toilet articles, a buffet, ice chest, writing table, mirrors and the like. It is lighted by electricity and communication is had with the driver through a speaking tube.

Another six-cylinder of the National line is the Model L touring car. The chassis and motive power are practically the same as used in the above-mentioned runabout and limousine, the body being very capacious and provided with extra seats in the tonneau.

The National four-cylinder cars embrace the National Model 11, 50 horsepower, and Model F, 40 horsepower, in limousine, touring car and runabout types, and all are the products of the National Motor Vehicle Company, of Indianapolis, Ind., and bear the distinguishing mark of the round radiator. With all these models a very complete equipment is included, comprising searchlights, lamps, tools, aprons, horn, etc.



SIX-CYLINDER NATIONAL LIMOUSINE THAT WILL SEAT NINE ADULT PASSENGERS

PREFERS TAR TO OIL AS A ROAD SURFACER

BY way of experiment, State Highway Commissioner James H. Macdonald of Connecticut has been treating a stretch of highway near Hartford with a coating of tar as a top dressing, and as the result appears to have been satisfactory the Commissioner in his recent report expresses some decided views upon the comparative merits of tar and crude oil treatments of highway surfaces, to the advantage of the former, at the same time admitting that the present method of spreading the tar is crude and must be perfected to obtain the desired lasting results. Mr. Macdonald says:

"The treatment of a highway with a tar compound is, of course, primarily to make upon its surface a coating which will withstand traffic whether of teams or automobiles. To succeed perfectly in this matter the method of applying the tar must be improved upon. At present it is primitive. A barrel or so of tar is heated in a jacketed boiler and run out upon the surface of the highway from a two-inch pipe, the flow being controlled by a valve. When once on the surface of the highway the hot tar is spread by means of brooms or a squeegee, the distribution being uneven as a result. Now, some means must be devised of getting this tar or tar product upon the surface of the road in an even coating, and some invention to this end must be discovered. A second thing which must be regarded is the weather. The tar must be applied when the weather is dry and hot, the dryer and hotter the better, if the surface of the road thus treated is to stand against the force of the automobile. The experience of the past warrants the belief that the method of applying tar will be so perfected that the treatment will prove successful. The end is, of course, to secure a road surface that will withstand all the strain of traffic, and to this end experiments with crude oil or some tar product are being made. There are advocates of both fluids and it will take time to tell which is the better.

"Heat is essential in the application of either tar or oil, heat being necessary to bring out the efficiency of the valuable elements. From my experience with tar I should say that the degree of heat necessary in applying it successfully is about the same as that needed in repairing concrete sidewalks. The road surface should be dry and the application made during a prolonged dry season at that. The tar should be heated to about 300 degrees and should be applied evenly, so as to form a complete veil over the surface of the road. The ordinary tar as produced as a by-product of the gas house is not calculated for the work, being too thin and containing elements not desirable for the work. The compound used should be thicker, certain volatile elements having been driven out of it. After the compound has been applied it should be followed by a coating of fresh stone no larger than will run through a half-inch screen.

The stone should be thoroughly clean and free from dust and should also be heated when put upon the tar compound. The road, for that matter, should have been cleared of dust before the application of the tar. After the stone has been applied the road should be rolled and then kept free from traffic until thoroughly cool, in order that the coating upon the surface may not be torn up by any vehicle.

"The use of crude oil has been more extensive, probably, than the use of the tar products, but in some respects it must be treated in a different manner. It is desired, however, to attain the same end, that of forming an elastic, dust-proof cushion upon the surface of the road. The use of crude oil is attended with less expense than tar, but it is just as desirable to apply it hot and when the road is dry. If the oil is heated it penetrates the roadbed more easily, but it is not so necessary that the surface of the road shall be clear of dust. There is very little wearing ability inherent in oil, and the dust or detritus absorbed into the oil combines to form the wearing surface of the road. The oil repels moisture better than tar. Water can be mixed to a certain extent with tar, but it is hard work to mix oil with water. On account of its lack of body oil should be applied two or three times at intervals of a month or so. Oil has been used considerably in the West on gravel roads, where it has been found to combine with the gravel so as to form a wearing surface of considerable durability. Its use should not be attempted on roads in which loam or clay predominate, and in all cases the surface of the road should be dry."

TREASURY SURPLUS FOR GOOD ROADS.

WASHINGTON, D. C., Feb. 18.—A unique good roads bill has been introduced in Congress by Representative John Sharp Williams of Mississippi. Its object is to distribute the surplus in the Treasury of the United States to the several States and Territories for the sole purpose of improving the roads therein.

The bill provides in effect that it shall be the duty of the Secretary of the Treasury at the end of each fiscal year to take an account of all the funds in the Treasury and after deducting from said sum the amounts required by law to be kept in the Treasury, the remainder, if any, shall be declared a surplus. The Secretary of the Treasury must then immediately provide for the distribution of this surplus, not exceeding \$25,000,000 annually during the continuance of the proposed law, on a per capita basis to the States and Territories, to be computed for the last general census, and shall prorate the same accordingly, for the sole purpose of improving the postal roads in said States and Territories, under such rules and regulations as the States and Territories may provide.



IMPROVING A ROAD IN SANTA CLARA COUNTY, CALIFORNIA, WHERE GRAVEL BEDS PREDOMINATE.

A. A. A. PROPOSES FEDERAL AUTOMOBILE BILL

AT the first meeting of the Executive Committee of the American Automobile Association, held Thursday, February 14, in New York City, Charles Thaddeus Terry, chairman of the Legislative Board, presented the proposed A. A. A. federal automobile bill, which will be introduced in Congress before the close of the present session. Recognizing that there exists throughout the country a general demand for uniform automobile legislation, President William H. Hotchkiss lost no time in appointing a legislative board, and Chairman Terry prepared at once, after consulting with his associates and others, the proposed bill, which unquestionably will serve to get the subject before those vitally interested, even though it may require some time to transform the measure into a law. It will be introduced before the close of the present session of Congress and again at the new session after March 4 if lack of time prevents its early consideration. The State bodies throughout the country will be called upon to lend all possible aid in calling the attention of their congressmen to the bill.

Annual A. A. A. Tour May Start in West.

Chairman F. B. Hower, of the Touring Board, was the only national chairman unable to be present at the meeting, he being at the time in California. Nevertheless, the Executive Committee voted that in its opinion the annual A. A. A. tour for the Glidden and other trophies should start from Chicago or some other Western city. This, however, is contingent upon the guaranteeing of a sufficient number of entries by the Westerners. It has been suggested that there might be a Western and Eastern division which would meet somewhere in Pennsylvania and continue to Washington. From that city there might be a supplemental tour through Virginia, the Shenandoah Valley, the

Jamestown Exposition being a possible destination. The Touring Board will at once get to work on rules, for it is desired that the conditions be enumerated at the earliest possible moment.

Racing Board Membership to Be Increased.

In line with the policy of the administration in making the various boards representative of the entire country, the Racing Board will be increased in numbers, and Chairman Jefferson DeMont Thompson at once will prepare the added names and submit them to President Hotchkiss for approval. Members will be named for all parts of the country in which racing events are likely to take place, including the Pacific and Western States, Florida, and Several Eastern States. It may become necessary to designate executive committees for the several boards.

Good Roads Board Wants National Aid in Road Building.

Chairman Robert P. Hooper, of the Good Roads Board, reported that his board will be completed in the near future, when a session will be held, at which the matter of government aid in road-building will receive attention, it being his idea, as well as that of several of his associates, that something along this line can be accomplished in view of the present universal agitation for the construction of improved highways.

Present at the Executive Committee meeting were: President, W. H. Hotchkiss; first vice-president, Lewis R. Speare; Jefferson DeMont Thompson; treasurer, George E. Farrington; Sidney S. Gorham, and A. G. Batchelder. A. R. Pardington attended as representing William K. Vanderbilt, Jr., who is at present in Europe. Robert P. Hooper, chairman Good Roads Board, and Charles Thaddeus Terry, chairman Legislative Board, were present upon invitation.

AUTO'S PRACTICAL VALUE THOROUGHLY DEMONSTRATED

WASHINGTON, D. C., Feb. 18.—“In five years the manufacture of automobiles in the United States has grown from an industry so unimportant that it was not reported separately at the census of 1900 to one with products valued at \$26,645,064 at the census of 1905, which covered the calendar year 1904,” says George E. Oller, in an elaborate report prepared for the Census Bureau. The author says this remarkable growth is not, like that of the bicycle, based on a fad, and so liable to as sudden a decline. Unlike the bicycle, the automobile is not essentially a new vehicle, but merely a carriage or truck with a new means of propulsion, possessing many advantages over a vehicle drawn by horses. As a means of amusement its popularity may fluctuate or decline, but its practical value has been so thoroughly demonstrated that its use will doubtless become more general each succeeding year, until it is displaced by some vehicle as much its superior as the automobile is the superior of the horse and wagon.

Though not yet perfected, says the report, the automobile has become at least reliable. Models and parts are being standardized, thus rendering it possible to replace broken or worn out parts without delay. In the United States many express and transfer companies, department stores and fire departments have abandoned the horse-drawn vehicle for the automobile. In New Mexico it has supplanted the stage coach between Roswell and Torrance, a distance of 101 miles. It has worked a revolution in Nevada, where the means of local transportation have heretofore been confined to the mule. Liverymen acknowledge the passing of the horse by operating automobiles in connection

with their stables. In many of the larger cities the automobile has been introduced for public transportation. Although it is as yet unsuited for general transportation in the field, yet the utility and advisability of the self-propelled vehicle for military purposes have been amply demonstrated. In Germany armored automobiles are being constructed for use in the army.

In the United States the use of automobiles will be limited only by their cost and the condition of the highways. The cost is gradually becoming less and the automobile itself is already felt as a factor in the movement for good roads.

The report gives a detailed historical and descriptive sketch of the automobile, which is entirely familiar to most automobile users. The report says the relatively small increase in number of establishments is due to the fact that the 57 reported in 1900 were engaged largely in experimental work, with little capital invested, and employing few workmen. Growth has been along the line of extending the capacity of the old plant, or abandoning them for new and much larger ones, rather than in increasing the number of establishments.

In 1904 the manufacture of automobiles was carried on by 121 concerns in seventeen States, while in 1900 thirteen States had automobile factories. At the census of 1904 Michigan, with 22 establishments, ranked first; New York stood second, with 21, and Ohio third, with 14. Massachusetts, with 11 establishments; Illinois and Indiana, with 8 each; Connecticut, with 7; California, Pennsylvania and Wisconsin, with 6 each, and New Jersey, with 5, followed in the order named.

PROPOSED PENNSY LAW HAS GOOD POINTS.

PHILADELPHIA, Feb. 18.—Many prominent local automobilists are in favor of the proposed Woodward bill, now before the State Legislature. One great point in its favor is the elimination of all local automobile legislation, Section 13 of the proposed new law killing all city, town and borough ordinances governing the operation of motor vehicles. Section 11 would sound the death-knell of the road hog who takes a fiendish delight in blocking an automobile on a narrow road; it would cost him \$10 for the first indulgence and \$25 for a second and subsequent, or 10 and 20 days respectively in jail. There are several other good points on the bill, and it is admittedly an improvement over the present law.

Motorcyclists, however, are not so liberal in their praise of the proposed new law. It would continue the present legal status of a motorcycle as an automobile, with the single exception that a red tail lamp need not be carried. This the riders of the motorcycle claim as an unjust discrimination, and the Federation of American Motorcyclists will send a delegation to Harrisburg to ask that some modification of the measure be made that will relieve them of the necessity of carrying two tags and wearing a 2 1-2-inch breast-plate bearing the legend "Pennsylvania Licensed Driver."

MINNESOTA'S PROPOSED NEW LAW.

ST. PAUL, MINN., Feb. 18.—A complete new automobile law for Minnesota is proposed in a bill introduced recently in the Minnesota legislature. It establishes a maximum speed of eighteen miles for country roads and for all highways not otherwise specified in the bill. For cities and for dangerous pieces of roadway, as before school houses and churches, and at cross roads, the speed is limited to eight miles. Cities and towns are also given full authority to pass local ordinances and regulations.

The proposed law provides that certificates shall be issued by the Secretary of State upon payment of a license fee of \$2. No provision is made for establishing the identity of a car, as to its county or city, however, and some automobile owners of Minneapolis and St. Paul have already protested. The numbering system in the two adjoining cities is badly snarled, as the result of conflicting laws passed within the last two years, and it is expected that an attempt will be made to straighten the tangle, through another law, to be offered later.

INDIANA LAW TO REMAIN SAME.

INDIANAPOLIS, IND., Feb. 18.—It has been practically decided by the Indiana Legislature that no legislation affecting automobiles will be enacted at this session. This was demonstrated a few days ago when, without debate, all automobile bills except one were postponed indefinitely on the recommendation of the Roads Committee of the House of Representatives. A decision that the law enacted two years ago covers the ground in a satisfactory manner is given as a reason for no further legislation.

CONFERENCE NEW YORK STATE AUTOISTS.

ALBANY, N. Y., Feb. 19.—The Legislative Committee of the New York State Automobile Association, with President Oliver A. Quayle presiding, held a conference to-day at which were discussed the various automobile bills that have been introduced at the present session of the State legislature. The situation was thoroughly discussed and a policy for future action decided upon. Delegates were present from nearly a score of clubs.

COULD ALSO DISCUSS UNIFORM AUTO LAW.

ALBANY, N. Y., Feb. 18.—Assemblyman Edwin A. Merritt has introduced a bill calling for a convention of delegates from the different States for the purpose of discussing uniform laws for the control of public service corporations. It has been suggested that the measure can be amended so as to include uniform automobile legislation.

NEW CHAUFFEURS' LEAGUE IN KENTUCKY.

LOUISVILLE, KY., Feb. 18.—The chauffeurs of this town have banded themselves together by the formation of the Chauffeurs' League of Louisville. A constitution and by-laws have been adopted and the following officers elected: President, James B. South; first vice-president, Chas. C. Morat; second vice-president, James Reister; secretary, W. C. Baker; treasurer, Roscoe Hogle. The most important feature of the League will be the College of Automobile Engineering, of which the officers of the League are directors. By means of demonstration and lectures it is expected to considerably raise the mechanical ability and professional status of the chauffeurs. The League protests against the whim of automobile owners in making their chauffeurs wear a uniform. In consequence of the increase in stone throwing at autos by rowdies the league has offered a reward for the arrest and conviction of offenders.

THIS AUTO IS INDUSTRIOUSLY VERSATILE.

ELKHORN, WIS., Feb. 11.—A Walworth county farmer who last summer caught the auto fever and bought a machine has it stored to-day where very few people would find it when out of motion. It is perched up somewhere near the ridge pole of the barn. It is resting on beams and is there stoutly bolted. All of the wheels have been removed, but on one end of the rear axle is a big flywheel and on the other a driver. Below on the barn floor something like a dozen different grinding, sawing, and chopping machines are belted at different times. The auto that is up in the air in winter quarters works every day at one stunt or another and has never laid off for repairs. The engine is worked on the two lower speeds, so that the machine is not wearing itself out by its unusual line of winter work.

WHERE AUTO IS POPULAR WITH THE FARMER.

GORDON, NEB., Feb. 15.—That the automobile is cutting considerable figure in farming matters nowadays is evidenced by the photograph taken last fall during the potato harvest. The party in the car is on an inspection tour over one of the largest potato patches in the great West. It is located near Gordon, on the Black Hills line of the Chicago and Northwestern Railroad, and in Sheridan county. This farm is so extensive that it requires all of the most modern potato raising machinery to handle the crop. A good many Sioux Indians are employed.

Some of the land agents who are in the new farming countries of the West and Northwest say that the automobile has made more rapid progress into the domain and the uses of the soil tillers than in the localities near the large cities of the Middle West. One feature of their adoption by farmers is the great variety of uses to which the cars and their power is put. In making fast time over the big ranches the automobile has laid the fast-flying broncho in the shade.



INSPECTING A NEBRASKA POTATO FARM BY AUTOMOBILE.

AUTO CLUBS PREPARE FOR SPRING WORK

Jersey Autoists Alive to Legislative Necessities.

NEWARK, N. J., Feb. 18.—At its meeting last week the New Jersey Automobile and Motor Club gave consideration to important legislative matters that have arisen in this State within the past six months. The sense of the meeting was that the present law provides entirely too many loopholes for motorists who are reckless and who do not propose to obey the law if they can avoid doing so. One of the most important of the resolutions passed was in favor of having all license pads issued by the State, thus attaining the uniformity of design that has been such a successful feature of the Pennsylvania law.

Another resolution of vast importance was that which calls for the carrying of lights at nights by all vehicles, whether horse-drawn or propelled by motors. There has already been introduced into the legislature a bill calling for the carrying of two lights on all vehicles.

The New Jersey Automobile Club has decided not to support this, however, for the reason that in many cases it would work a hardship to owners of horse vehicles, although it is practically a necessity in the case of automobiles. The motor club's resolution calls for only one light. It was stipulated that this provision go as an amendment to the general road laws and not to the Frelinghuysen automobile act.

Other resolutions having to do with the increasing of the force of motor vehicle inspectors with power to arrest without war-

rant, and to require motorists to show licenses; the throwing of glass and nails upon highways, and the establishment of a permanent legal committee by the club were passed, as was a resolution to the effect that all automobilists who are regularly registered in their native States shall have the right, by application to the Federal Government, to a certificate that will give them the right to pass through any State in the Union.

Aero Club Banquet at Hotel St. Regis, March 14.

NEW YORK CITY, Feb. 18.—The first banquet of the Aero Club of America will be held at the Hotel St. Regis, March 14, and the quick response to the suggestion makes it probable that the seating capacity of 150 will be severely taxed. It is among the probabilities that the Wright Brothers will be guests of the occasion, with representatives of the St. Louis Aero Club.

F. S. Lahm, J. C. McCoy and A. R. Hawley have been selected to represent America in the Gordon Bennett contest at St. Louis in October next. Three alternates will be announced later. Capt. Charles deF. Chandler, of the Telegraphic Division of the Signal Corps, U. S. A., has charge of the arrangements for the Washington's Birthday balloon ascension, to take place at Washington, D. C., on Friday of this week. The club's headquarters will be at the New Willard Hotel.

Quaker Yorkites Will Entertain A. A. A. Tourists.

YORK, PA., Feb. 18.—Two events of more than ordinary interest—the proposed southern tour of the American Automobile Association and the big endurance run which will have York as one of its stopping places—have served to inspire the local autoists with new enthusiasm. The first event, which is by far the most important of the two, will be given a welcome reception in this city should the A. A. A. committee decide to send it South by the famous Gettysburg pike route. It is certain that in giving this route consideration no better opportunity could be afforded the Glidden tourists of viewing, not only one of the most picturesque stretches of landscape in the country, but one that is replete with historical mementos of the great civil conflict of 1861-65. The tour would also add greatly to the movement for improvement which is at the present time being strongly agitated.

The York County Automobile Association at its last meeting took up the A. A. A. tour subject, and, with general accord, it was decided to give the tourists a royal form of entertainment in the event of the route being set in this direction. "Globe Trotter" Glidden, in his recent tour through this part of the country, was much impressed with the scenery. The roads are not the best that could be had, in his estimation, but they are not bad either. In Glidden's terms, "The roads through the Keystone State are fair for touring."

The endurance run, which will be held

April 8 and 9, starting from Harrisburg and making this city the first general stop, will be participated in by quite a few Yorkers. The run will extend through Lebanon, Marietta, Columbia, Wrightsville, York, Gettysburg, Waynesburg, Chambersburg, Carlisle, Mechanicsburg, and back to Harrisburg. Two silver cups will be given to the successful contestants.

Activities of the Quaker City Motor Club.

PHILADELPHIA, Feb. 18.—Local automobilists are wondering whether there is an African in the wood-pile in the action of the board of governors of the Quaker City Motor Club, last week, when a committee consisting of Nathaniel Hathaway, George H. Smith and G. Douglas Bartlett was appointed "to get in touch with the automobile clubs of the State, with a view of forming a State organization." The fact that the action mentioned followed the election of President Charles J. Swain as the club's representative on the Touring Board of the American Automobile Association is said to have some significance. Many of the members of the Quaker City Club also belong to the Automobile Club of Philadelphia, which is affiliated with the Pennsylvania Motor Federation.

Said one prominent P. M. F. man in discussing the matter: "It seems like an entering wedge for a tentative compromise.



AN A. C. OF CALIFORNIA CLUB RUN AT THE HOTEL DEL MONTE. Monterey, Cal., is one of the most popular resorts on the Pacific Coast, and a favorite terminal for the tours of automobilists in the vicinity of San Francisco.

having for its ultimate object a thorough reorganization of all the automobilists of the State under A. A. A. auspices. I, for one, would welcome such an outcome, for while the Federation is doing excellent work, I believe that it could do even better had it the backing of the national body. Such an arrangement could be framed up without much trouble, and any points of friction could be easily neutralized by an application of a little oil of common sense. I do not believe in dividing forces in sight of the enemy; every owner of a motor car in the State of Pennsylvania should belong to a single organization working, first, for the betterment of conditions in our own State; and second, for the passage of national automobile laws which shall improve conditions throughout the country. This latter benefit cannot be obtained through the medium of a State body."

Among other business transacted by the board at the meeting was the naming of the Contest Committee, consisting of W. Wayne Davis, C. A. Woolson, E. H. Lewis, T. B. Creamer, G. Hilton Gantert and Richard A. Sellers, with the indefatigable E. C. Johnson as chairman. The board later sanctioned the committee's project of holding a monster hill climb on Memorial Day. The membership committee, to whose conscientious work much of the present success of the club is due, was reappointed *in toto*. It is made up of C. A. Woolson, H. B. Lasher, J. A. Wister, A. T. Stewart and W. Wayne Davis.

President Swain and seven of his confrères leave to-night for the Cleveland show, and will visit Akron's tire factories before their return.

Tacoma A. C. Holds Its Annual Election.

TACOMA, WASH., Feb. 18.—At the annual meeting of the Tacoma Automobile Club a complete new set of officers was elected, and one which assures that the automobile interests here will be well guarded. The new officers are: President, Chester Thorne; vice-president, Richard Vaeth; secretary, H. H. Gove; treasurer, Fordyce Taber; trustees, John F. Lyon, J. C. Donnelly and Calvin Philips.

The club decided to take the initiative in some important movements. One is the appointing of a committee to raise \$5,000 to be spent in aiding property owners along Center street to improve that thoroughfare. Nearly two miles of this is the connecting link between the city and the American lake district, one of the grandest automobiling grounds in the country. An effort will also be made to secure a rescinding of the order which prevents autos being taken into Rainier National Park, which lies up in Mount Tacoma-Rainier. A committee was appointed to take this matter up with the Tacoma, Seattle and Portland chambers of commerce.

Sixth Annual Banquet of the A. C. of Philadelphia.

PHILADELPHIA, Feb. 18.—Preparations for the sixth annual banquet of the Automobile Club of Philadelphia indicate that that annual symposium will exceed in importance any similar event in the club's history. Added importance is given the affair by the fact that Governor Stuart and the new Mayor of Philadelphia (election Tuesday) will surely be present. They will be reinforced by other speakers equally prominent in local political, business, professional and automobile circles. Competition seems to be the life of clubs as well as of trade, for since the formation of the hustling Quaker City Motor Club its ancient and dignified prototype has begun to sit up and get busy. The 400 mark in membership will be passed at the next meeting, with prospects of still further additions in the very near future.

Rushing Work on the Chicago Automobile Club's House.

CHICAGO, Feb. 18.—In less than a month the new clubhouse of the Chicago Automobile Club, in Plymouth Court, will be under roof. The huge stone coping, with the legend "Chicago Automobile Club," has been put in place and the archways on which the cars will run in entering the garage already are in position. The membership of the club has almost reached the 600 mark.

THE AUTOMOBILE CALENDAR.

AMERICAN.

Shows.

- Feb. 26-Mar. 2.—Portland, Me., Second Annual Automobile and Power Boat Show, The Auditorium.
 March 2-9.....—Chicago, Second Annual Power Boat Show, Seventh Regiment Armory. W. C. Andrews, manager, 19 E. Huron St.
 March 2-9.....—Minneapolis, Automobile Show, First Regiment Armory, Minneapolis Automobile Dealers' Ass'n.
 March 4-10.....—Kansas City, Mo., First Annual Automobile Show, Convention Hall. Frank L. Woodward, manager, Willis Wood Theater Building.
 March 9-16.....—Boston Automobile and Power Boat Show, Mechanics' Hall and Horticultural Hall, Boston Automobile Dealers' Association. C. I. Campbell, mgr.
 March 13-16....—Omaha, Auditorium, Second Annual Automobile Show, Omaha Dealers' Association. T. Gillian, manager.
 March 18-23....—Providence (R. I.) Automobile and Power Boat Show, Infantry Hall. F. M. Prescott, manager.
 April 1-6.....—St. Louis, Mo., Automobile Show, Jai Alai Building, St. Louis Automobile Dealers' Association.
 April 6-13.....—Montreal, Canada, Second International Automobile and Sportsman's Exhibition. R. M. Jaffray, manager, 309 W. Notre Dame Street.
 April 8-13.....—Pittsburg, Pa., First Annual Show of the Pittsburg Automobile Dealers' Association, Duquesne Garden.

Race Meets, Hill Climbs, etc.

- Feb. 22.....—Los Angeles, Cal., Pasadena-Altadena Hill Climb, Automobile Dealers' Association of Southern Cal.
 Feb. 22.....—Atlanta, Ga., Hill Climb, Atlanta Automobile Association. F. E. Rushlander, secretary.
 Feb. 22.....—Washington, D. C., Aerial Race, Aero Club of America.
 May 30.....—Philadelphia, Hill Climb, Quaker City Motor Club.
 Oct. 19.....—St. Louis, Mo., International Aerial Race for the Gordon Bennett Prize. Aero Club of America.

Motor Boat Races.

- June 8.....—670-Mile Ocean Motor Boat Race, New York to Bermuda. Motor Boat Club of America and Royal Bermuda Yacht Club.
 July 20.....—New York to Marblehead, Mass., 270-mile Motor Boat Race. New Rochelle Yacht Club.
 Sept. 2-6.....—Jamestown (Va.) Exposition, Motor Boat Races.

FOREIGN.

Shows.

- March 7-16....—London, Olympia Commercial Vehicle and Motor Boat Show.
 March 15-23....—Edinburgh, Scottish Cycle and Motor Show.
 April 6-13.....—London, Agricultural Hall Motor Show.
 May 4-15.....—Madrid, Spain, Automobile Exhibition, Palace of Fine Arts, Royal Automobile Club of Madrid.
 May 15-26.....—Zurich, Third Annual Swiss Automobile Show.

Race Meets, Hill Climbs, etc.

- Feb. 23-27.....—Vulturette Contest, Automobile Club of Italy.
 March 20-27....—Nice (France) Automobile Week.
 April 1-16.....—Spring Wheel Competition, A. C. of France.
 April 21.....—Targa Florio Tour (Sicily), Auto Club of Milan.
 April 25-28....—Touring Contest, Automobile Club of Touraine.
 April 28.....—Chateau Thierry Hill Climb.
 May 24-27.....—Vulturette Contest, Automobile Club of Austria.
 May 29-June 1..—Irish Automobile Club Reliability Trials.
 June 3-12.....—Herkomer Cup, Automobile Club of Bavaria.
 June 14.....—German Emperor's Cup, Taunus Circuit, Imperial Automobile Club.
 June 20-22.....—American Gold Cup, Start from New York of European Tour for American Cars. Georges Dupuy, secretary, 1402 Broadway, New York City.
 June 24-29.....—Scottish Reliability Trial, Scottish Automobile Club.
 July 1-July 8...—Grand Prix, Automobile Club of France. (Exact date to be decided upon.)
 July 14, 1908...—Paris to London Aerial Race.
 July 15-18.....—Ostend Week, Record Trials, Automobile Club of Belgium.
 July 21.....—Ardennes Circuit (Belgium).
 July 31.....—Liedekerke Cup for Touring Cars, Ardennes Circuit, Belgium.
 August 1-7.....—Criterium of France, 1,750 Miles Touring Competition and 250-mile Race for the Press Cup. (Exact dates to be fixed.) A. C. of France.

AUTO DOES WORK OF FOUR TEAMS.

SPRINGFIELD, MASS., Feb. 18.—When one Atlas motor truck can deliver 16 tons of crushed stone eight miles in a day, to two, or possibly three tons, for a double team, the term "horseless age" takes on a meaning. The atlas truck made four round trips of 17 miles each between Boston and Roxbury, delivering 16 tons of rock for the Metropolitan Park Commission. The total cost of the day's work, one man only being needed, and



AN ATLAS TRUCK WHICH DID THE WORK OF FOUR TEAMS.

including gasoline and oil, was \$5.44, or 34 cents per ton. A double team making one round trip and carrying two, or at most three tons, would cost \$6.50 per day, or \$2.17 per ton.

In the cut is shown one of the Atlas type B trucks which has been delivered to the park commission, and is especially and finely designed for road work. Both the tank and sides are removable, making it easily convertible into either a merchandise or a sprinkling truck. Four ordinary horse-drawn sprinkling carts could not do the work of this one powerful apparatus. The truck is fitted with the Atlas water-cooled engine of 24-horsepower, and, under load, will travel 10 to 12 miles per hour.

It is interesting to note, especially in Springfield, the home of the Knox Motor Truck Company, that the United States Government recently in advertising for motor trucks, specified the "Atlas Type B" as the trucks desired, and gives the same general specifications as were called for by the Metropolitan Park Commission, of Massachusetts.

DINNER OF THE NEW YORK TRADE.

United action in all matters of interest to the dealer and the garage keeper was the keynote of the speeches at the dinner given by the New York Automobile Trade Association at Healy's, Friday evening, February 15. The work which the association has been doing was clearly shown in brief statements by the officers. In the absence of President Percy Owen, who is in Europe, Carl Page, the vice-president, acted as toastmaster. There was a general discussion of the work which the association has accomplished by having a member on the Municipal Explosive Commission; of its guidance of what has been a new business to everyone, and of its care and development of a line of trade that now runs into millions of dollars in the big city. The speakers included Frank Eveland, C. R. Mabley, Peter Fogarty, C. Andrade, Jr., and Alfred Reeves.

There were numerous suggestions offered for the advancement of the trade as a whole, among them being one by Alfred Reeves, general manager of the American Motor Car Manufacturers' Association, in favor of an "Automobile Sale Week" in New York. The idea is to have a special week in March or April when buyers in the city and the vicinity would know that salesrooms would make special preparations for the showing of new models and special arrangements for demonstrating.

Among those at the dinner and the firms and cars they represented were: H. B. Phenny (C. A. Duerr & Co.), H. H. Cobe (Cobe Auto Co.), V. J. Vashon (Advance Motor Car Co.), H. H. Knepper (Frayer-Miller Co.), F. F. Sampson (N. Y. Transportation Co.), V. A. Viller (Studebaker Automobile Co.), C. B. Warren (Haynes Automobile Co.), W. J. Coghlan (Metropolitan), Frank Eveland (Stevens-Duryea), C. R. Mabley (Smith & Mabley), G. W. Post (Panhard & Levassor), G. A. Knowles, J. F. Plummer (Locomotive), C. Andrade, Jr., Peter Fogarty, Alfred Reeves, Wm. A. Allen, Alfred Semnacher (Russell Co.), W. H. MacIlroy (Delhaye & Palain Agency), W. H. Shutt (H. J. Koehler Co.), C. W. Willis (Hudson Auto Co.), Wm. T. Eames (Harlem Auto Co.), A. G. Fobeken (Mt. Morris Auto Co.), E. S. Partridge (Wyckoff, Church & Partridge), A. H. Chadbourne (Bouton), L. Markle (Corbin), G. M. MacWilliam (Darracq), E. F. H. Cox (De Dietrich), R. H. Fenker (Parkway Garage), C. H. Covell (Parkway Garage), B. Blumenthal, C. E. Domini (West End Garage), R. B. Van Dycke (Berliet), W. Murray (Percy Owen, Inc.), A. J. Robinson (Elmore), Chas. W. Graham (Graham & Goodman), A. M. Thackara, Jr. (Westinghouse), J. J. Evans (Daimler), F. R. Welch (Alborak Garage), C. H. Larson (Oldsmobile), E. Buffum (Empire State Garage), Lee Ephriam (United Auto Co.), P. W. Barton (S. W. Bowman Auto Co.), A. M. Robbins (Aerocar), T. A. Phillips (W. J. Duane & Co.), Jos. Troxell (New Amsterdam Auto Co.), L. F. Albro (Chelsea Auto Co.), M. A. Driscoll, Jr. (Smith Auto Co.), C. S. Silver (Smith Auto Co.), Harry Unwin, J. W. Ball, Carl Page (White Company).

CADILLAC'S NON-STOP THOUSAND.

SEATTLE, WASH., Feb. 6.—While the Middle West was snow bound, the East experiencing gales in zero weather, other sections snow slides or flood troubles, and this section shut off from the rest of the world, excepting by wire communication, a world's automobile record was being established.

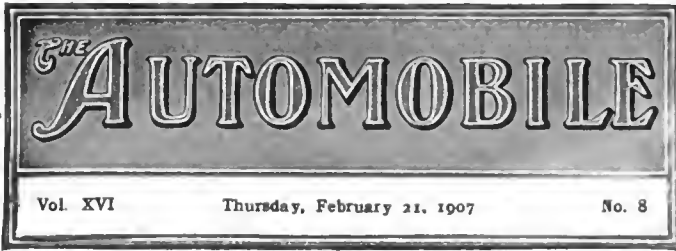
At noon, to-day, F. G. Plummer, at the wheel of a one-cylinder Cadillac, completed a 1,000-mile non-stop ride in 71 hours, 32 minutes. This is the best non-stop record for a one or two cylinder car, the best previous distance being 600 miles. The entire distance was covered on the streets of Seattle. The start was made Sunday afternoon, shortly after a fall of several inches of snow. Before the ride was a day old a thaw had set in with occasional showers. But throughout it all the Cadillac kept pounding along, and not for a second did the engine show signs of bucking. The start and finish was made from in front of the *Times* office, and at the back of the seat was a sign which proclaimed: "A-1,000 miles and then some. Still going." The engine was still pumping away when the car



SINGLE CYLINDER CADILLAC WHICH DID A THOUSAND NON-STOP.

was brought to a stop, and the seal broken. The ride was remarkably free from accidents, and the speed limit of the city was exceeded only during the last 50 miles.

During the ride 54.5 gallons of gasoline were used, and this under conditions that demanded an open throttle most of the time. Two gallons and a half of lubricating oil were used. The tires show but little wear.



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The Real Nationalization The Hotchkiss administration of the A. A. A. A. A. affairs is quickly making it clear that the new president intends to make the organization of practical worth from a national standpoint. The idea of federal automobile legislation is not new, but previous leaders of the A. A. A. have done nothing but talk and made no concerted effort in a direction which interests the automobilists of the entire country. There is a division of opinion as to the probability of securing a national automobile law, but the measure which Chairman C. T. Terry of the A. A. A. Legislative Board brings forward will call general attention to the subject and ultimately result in securing that which is desired, even though the manner of so doing may be modified to a considerable degree. The subject of inter-State registration is second to no other in point of interest to the touring automobilist.

Though the Brownlow-Lattimer good roads bill has lain dormant for a year or more, Chairman R. P. Hooper of the A. A. A. Good Roads Board believes that national aid in road building is worthy of a revived effort on the part of his board, which upon his early formation will concern itself at once with this ever-pertinent subject. If harbors and rivers can be dredged for water transportation, why, asks the automobilist, cannot general trunk roads be built for inter-State traffic? Certainly it would appear that it should not be unconstitutional for the national government to assist those States which are willing to come forward with a still greater amount of money to be expended in this improvement that is of such vital importance.

Busily engaged in creating State associations wherever possible, the A. A. A. soon will be represented by a flourishing chain of State bodies extending over the entire country, and these working in a national way can bring about untold good to the cause of automobilism.



The Touring Dream of All Automobilists.

No finer touring ground in the world exists for the automobilist than the chateaux country of Touraine. Its accessibility from Paris—though Mr. Miltoun advises and tells how one can arrive in France and reach Touraine by avoiding the gay capital—makes it the most convenient and picturesque territory in the grasp of the stranger whose time is limited and who must needs hurry some in his fleeting glimpse of the Old World. There is romance galore and history in abundance in the valley of the Loire, and the remembrance of it will linger for many a day with those who are fortunate enough to tour through the country which was once the playground of the French monarchs. Mr. Miltoun, knowing his subject thoroughly, has outlined a tour of the chateaux country that economizes in time and gives one an excellent itinerary, comprehensive and gleaned from an extended experience. There will be more American automobiles and automobilists seen in France the coming Spring and Summer than ever before, and to these we recommend the reading of Mr. Miltoun's article, which gives just the sort of information wanted alike by the leisurely inclined as well as by those who are compelled to count the days which they can spare for the most delightful of modern pastimes—automobiling in a good car over the well-built roads of La Belle France. Roads that are as smooth and wide as our boulevards, stretching into the distance as far as eye can reach, replete with signboards and kilometer stones, with sleepy villages and an occasional bustling city in the pathway, what greater delight can one ask for than this healthy open-air travel supplied by the automobile? Some day in our own prosperous land—and we are awakening to the situation with a sudden start—there'll be miles and miles of road that will bring our scenic beauties in the reach of the seeker, driving his automobile, of new sights and a change from his accustomed environment that will amply repay the seeking.



To Prevent Gasoline Reaching Sewers.

Long before New York had any automobiles or garages, corroding and poorly-jointed gas pipes poured their quota into the sewers, and a timely spark from underground electric wires lent variety to urban life by sending iron manhole covers flying into the air with more or less frequent regularity. "Leaky gas pipes" explained to everyone's satisfaction. There are more leaking gas pipes under New York City to-day than ever there were, due to the rapid corrosion of electrolysis set up by underground currents on the wrought and cast iron.

It is conceded that large quantities of gasoline are used daily in city garages for washing purposes, and that more or less of it naturally finds its way into the sewers, but that the proportion is anything like as great as popularly supposed, or that it is responsible for sewer explosions that take place in the financial district or way out in the suburbs, is absurd.

There can be no valid objection to the enforcement of a long-forgotten ordinance, however, compelling the use of a special form of drain trap wherever gasoline is used, but that sewer explosions will be any the less frequent on that account appears doubtful. The strangest thing about this latest attempt to further safeguard the use of an admittedly dangerous fluid is to be found in the fact that householders should smell gasoline vapor from the sewers in their cellars, and nothing else. Queer plumbing, indeed, that will pass one per cent. of gasoline vapor and leave 99 per cent. of sewer gas behind.

MOTOR BOAT SHOW AUSPICIOUSLY OPENED.

Tuesday evening, February 19, witnessed the opening of the National Motor Boat Show in Madison Square Garden, New York. It will continue until February 26. There is every indication that the exhibition will be the most successful one ever conducted under the auspices of the National Association of Engine and Boat Manufacturers, an organization embracing the longest established and leading concerns of the country. Nautical decorations, of course, predominate, yacht club, signal and navy flags covering the balcony fronts. The exhibits typify the latest and best types of motor boat construction, together with a big variety of accessory displays.

Washington's Birthday, February 22, will, as customary, be "Family Day" at the Show, and Saturday, February 23, will be "Children's Day."

Automobilists are numerous in the large crowds which are flocking into the Garden, and even this early sales are reported which bear the earmarks of authenticity. The exhibition surpasses all previous motor boat affairs by a wide margin.

CHICAGO WANTS CONCLUSION A. A. A. TOUR.

CHICAGO, Feb. 18.—Entire satisfaction is felt over the appointment of Ira M. Cobe and S. K. Martin, Jr., to positions on the racing board of the A. A. A. Both men are capable, and the selections will tend to draw the East and West closer together, and will also act as a stimulus upon Western manufacturers who contemplate building cars for the Vanderbilt race.

The Chicago Motor Club has just become a member of the Illinois State Automobile Association, and through this new relation affiliated with the A. A. A. At its meeting Friday the resignation of its first president, William A. Arthur, was accepted, and F. C. Donald elected to succeed him. David Becroft was chosen to fill Mr. Donald's place in the directorate. A committee was appointed with the object of prevailing upon the Glidden Tour Committee of the A. A. A. to change the route of the 1907 tour to the New York-Chicago course, instead of the proposed Chicago-Washington-Jamestown Exposition route.

The Chicago Automobile Trade Association and the Chicago Automobile Club will probably appoint similar committees that the three bodies may work in harmony to secure their desire that Chicago may be the end, instead of the start, of the Glidden Tour. It is argued that should the change be made the entry list would be the largest ever known, as the good hotel accommodations to be secured in the large cities would tend to attract many to the tour who would not make the trip should it go in any other direction.

ANNUAL BANQUET OF THE SYRACUSANS.

SYRACUSE, N. Y., Feb. 18.—The Automobile Club of Syracuse held its annual banquet at the Yates Hotel. Over one hundred members and friends of the club enjoyed the affair. A decided hit was made with an illustration on one side of the menu cards. It represented a polecat awaiting the assault of an approaching automobile. The picture bore the legend: "When Greek meets Greek." Around the banquet room were signs which the club will put in the spring about the county to direct tourists to other cities. President Hurlburt W. Smith called the assemblage to order for the toasts. He referred to the leading part taken by the Syracuse club in the formation of the New York State Automobile Association.

Toastmaster Howard P. Denison read a letter from Frederick H. Elliott, secretary of the Automobile Association of America, formerly secretary of the Syracuse club. Supervisor Robert E. Gilman spoke on the subject of good roads. He said twenty miles of State roads had been completed in this county, and 231 more are to be constructed. He assured the club that the State Highway Commission would not allow any unfair bills to pass the Legislature at Albany. There were other speakers, including Giles H. Stilwell, president of the Chamber of Commerce; William H. Rubin, Police Justice Benjamin J. Shove, and J. William Smith.

WASTE GASOLINE AGAIN A MENACE.

As a result of numerous complaints, said to have been made on the part of New York City householders in what is known as the automobile district, to the effect that the cellars of houses were so filled with gasoline fumes as to make it dangerous to strike a light in them, a hearing was held by Hugh Bonner, chairman of the Municipal Explosives Commission, at Fire Headquarters, in which he discussed the matter with C. R. Mabley, representing the New York Automobile Trade Association; S. M. Butler, secretary of the Automobile Club of America, and Thomas F. Winters, superintendent of the club's new garage. It was decided that all garages should be compelled to install a special form of trap in the drain pipes, so as to catch any gasoline that would otherwise find its way into the sewers. It is customary with chauffeurs to wash the machinery of the cars with gasoline, and also to wash their hands in it to remove oil and grease, the latter practice being the most prolific source of complaint.

Messrs. Mabley and Butler were given the task of settling on some form of trap that would separate the gasoline from other forms of sewage, the device to be officially approved before being finally adopted. This will probably take the form of what is commonly known as a grease trap, or settling trap, except that a cold water jacket will not be necessary. In this form of trap both the inlet and outlet are at the bottom, with a partition or baffle plate between them to facilitate the collection of the grease on the surface. With gasoline no cooling effect will be needed, but some means for drawing off the gasoline which collects on the surface of the trap will have to be provided. In addition, it will be well vented. It seems that there has long been an ordinance calling for the use of such a trap wherever gasoline is used on city premises, but it has never been enforced.

A joint meeting of the committees of the two organizations is to be held during the present week, at which the devices suggested will be passed upon and submitted to the authorities.

BRITAIN'S ENTRY FOR THE VANDERBILT CUP.

PARIS, Feb. 15.—The London correspondent of the Paris *Herald* supplies the following story:

The only British automobile which will compete for the Vanderbilt Cup in America and the Grand Prix in France is of purely British build. It is but a few months since the Weigel workshops were opened in Goswell road, and it only requires a visit there to prove how busy they already are. Though D. M. Weigel is the youngest builder of automobiles in Great Britain, he can fairly lay claim to being the pioneer of automobilism in England, for it was he who in 1893 introduced the first petrol-driven automobile into England. That was three years before the "emancipation act," as it is called, was passed, and a sorry time he had of it with summonses for breaking the law. He has had as many as thirty summonses in his pocket at one time, for which he had to pay, on conviction, the sum of one shilling for each "offense." But he persisted until the police authorities got tired of summoning him, so long as he did not drive to the public danger.

R. Lassen, a member of the Weigel firm, will drive the machine in the Vanderbilt Cup, and he is now in New York.

AMERICAN MERCEDES FACTORY BURNED.

By reason of a disastrous fire of unknown origin which started in the plant of the Daimler Motor Works at Steinway, Long Island, early Thursday morning last, the factory in which the American Mercedes cars were built was totally destroyed, together with a number of machines. Among these were two racing cars, one of which was used at the recent Ormond meet, besides eight completed cars and forty in course of construction. The damage to the plant and contents is estimated at \$500,000, which is said to be fully covered by insurance. The plant was also engaged in the building of Daimler motors and motor boats and employed about 300 men.

CLEVELAND'S SHOW THE BEST OF ITS HISTORY

CLEVELAND, Feb. 18.—The Cleveland Automobile Show, which opened this evening, is by far the most impressive exhibit of automobiles this city has seen. The big Central Armory presents a striking scene. The attendance this evening is the largest that ever turned out for a similar event in Cleveland.

The exhibition of automobiles is very complete. There are 27 exhibitors of automobiles, showing 44 makes of machines, and there are about 150 cars on the floor. The distinguishing feature of the exhibits this year is the great preponderance of the so-called speed car—the runabout. Practically every manufacturer represented shows something on this order, not even excluding the electric vehicle makers. One of the cars shown for the first time is the 35-horsepower Gaeth, built by the Gaeth Automobile Company, of this city. It is a handsome car and sells at \$3,500. A newcomer in the field is the Barnes Manufacturing Company, of Sandusky, O., which shows the Servitor runabout, fitted with a 20-horsepower four-cylinder engine, with friction drive, and selling at \$1,250. The list of exhibitors follows:

Automobiles.

The Auto Shop Company—Thomas and Franklin.
 Barnes Manufacturing Company—Servitor.
 Boulevard Garage Company—Glide, DeLuxe and Queen.
 Chisholm & Phillips Company—Stevens-Duryea.
 Cleveland Motor Car Company—Cleveland.
 Cleveland Oldsmobile Company—Oldsmobile.
 W. B. Davis—Jewell.
 Euclid Garage—Pungs-Finch.
 Ford Motor Company—Ford.
 Gaeth Automobile Works—Gaeth.
 Holmes-Booth Company—Pope-Hartford, Pope-Waverly, Lozier.
 R. H. Magoon Motor Car Company—Pope-Toledo and Locomobile.
 Metropolitan Motor Car Co.—Cadillac, Babcock, Pierce.
 H. S. Moore—Stoddard-Dayton.
 Ohio Motor Car Co.—Buick, Columbia, Haynes, Waltham-Orient.
 George S. Patterson—Reo and Premier.
 Paxon Motor Car Company—Jackson.

Rauch & Lang Carriage Company—R. & L. electric vehicles.
 Reese Motor Car Company—Royal Tourist and Columbus electric.
 Standard Automobile Company—Autocar, Packard and Peerless.
 The F. B. Stearns Company—Stearns.
 Studebaker Automobile Company—Studebaker.
 T. C. Whitcomb Automobile Company—Rambler and National.
 Williams Electric Vehicle Company—Williams electric vehicles.
 White Garage—White steamers.
 Winton Motor Carriage Company—Winton.

Accessories.

American Ball Bearing Company—Ball bearings and axles.
 Auto Equipping Company—Accessories.
 Avery Stampings Company—Steel stampings.
 Bassett-Presley Company—Sheet metals.
 S. F. Bowser & Co.—Pumps and gasoline tanks.
 Coilister & Sayle—Tanks, lamps and sundries.
 Wm. Cramp & Sons—Manganese bronze castings.
 Joseph Dixon Crucible Company—Graphites and lubricants.
 Electric Storage Battery Company—Exide batteries.
 W. C. Farrand—Batteries.
 Ferro Machine and Foundry Company—Gasoline engines.
 Gabriel Horn Manufacturing Company—Horns.
 Gumelastic Tire Company—Tire composition.
 Hartford Suspension Company—Shock absorbers.
 Hoeffcker Speed and Mile Register Company—Speedometers.
 Julius King Optical Company—Goggles, glasses, etc.
 Lorain Machine and Forge Company—Lubricators.
 Charles E. Miller—Sundries.
 L. J. Mueller—Motorcycles.
 National Carbon Company—Batteries.
 Peter Orloff—Furs.
 J. M. & L. A. Osborn Company—Aluminum finish.
 Penn Rubber Company—Tires.
 Perfection Spring Company—Springs.
 Punctureproof Tire Company—Tires.
 Sprague Umbrella Company—Tops and dashes.
 Sherwin-Williams Company—Paints and varnishes.
 Standard Oil Company—Lubricating oils.
 Standard Welding Company—Electrically welded parts.
 United States Graphite Company—Graphite.
 Veeder Mfg. Co.—Tachometers, odometers, counters, etc.
 Warner Instrument Company—Speedometers.



THE CENTRAL ARMORY'S CAPACIOUS INTERIOR SPLENDIDLY ACCOMMODATES THE EXHIBITS AT THE CLEVELAND SHOW.

BUFFALO'S SHOW BRILLIANTLY SUCCESSFUL

BUFFALO, Feb. 20.—Surpassing its predecessors in quality and quantity of exhibits, and, incidentally, in decorative interest, the fifth annual automobile show of the Automobile Club of Buffalo was opened in Convention Hall, Monday night, disclosing to auto enthusiasts of Buffalo and surrounding cities the rapid strides made in the manufacture of automobiles since the last exhibition. Unquestionably it is the greatest exhibition of cars that has been placed before the people of this city in the history of the automobile. It is a revelation in the process of motor car evolution.

Lack of space compelled Secretary D. H. Lewis to deny several applications from well-known manufacturers, and the only regret the management of the show and the people of Buffalo had was that Convention Hall is really too small for a suitable and appropriate exhibition of the American automobile.

Convention Hall is spectacularly decorated for the show. Its bare and forbidding iron girders and cold ceiling are hidden behind a canopy of green and white, and the decorations are artistically and handsomely arranged so as to attract the attention of the people after they have finished their close examination of the many automobiles placed there for their scrutiny. The first thing that catches the eye of the spectator on entering the hall is the decorative work, an ephemeral memory to the credit of the decorator. The entire roof is concealed by a beautiful canopy of white and pea green, which blend admirably. In the center of the hall is a center-piece, like an inverted canopy of green and white, which is studded with nearly 500 16-candlepower electric bulbs, making a brilliant and dazzling spectacle. Reaching from the girders to the rail of the balcony is a huge reproduction of the emblem of the Automobile Club, a painted buffalo head in the center of a tire, on either side of which are spread wings. One thousand incandescent lights make this piece an attractive feature of the show that cannot be overlooked.

Floor space is so divided that the central portion is separated from the side exhibits along the walls by wide aisles, while the central section is divided by a wide aisle running the entire length of the hall. The spaces for exhibits are carpeted with dark green. Over each exhibit is a large sign announcing the name of the automobile, each sign studded with electric bulbs. In this manner nearly 3,000 incandescent lights are placed in the hall, making a scene that for brilliancy has never before been equaled locally.

There are thirty-six exhibitors. Big touring cars, runabouts, trucks, motorcycles, and accessories of every description that are needed in the general construction of an up-to-date automobile are displayed in attractive fashion.

The Pierce "Great Arrow" greets one as he enters the hall. Back of that in the main center space are the Thomas Flyers and the Babcock Electrics, with other types of automobiles of every

description. On a small scale, the automobile show of Buffalo rivals the recent exhibitions at New York and Chicago, and for beauty and fantastic decoration is the best exhibition of its kind ever held in this city. Delegations from Rochester, Toronto, Syracuse, and other cities are announced for later in the week.

The commercial vehicle is also displayed by concerns which devote their plants to the sole construction of this class of horseless conveyance. The opening night brought forth a larger attendance than has ever been seen here.

The following is a list of the exhibitors of the Buffalo Show:

Automobiles.

George N. Pierce Co.—Great Arrow.
E. R. Thomas Motor Co.—Thomas Flyer, Thomas "40."
Babcock Electric Carriage Co.—Babcock electric.
Brunn Carriage Co.—Brunn's electric. Stevens-Duryea.
Auto Car Equipment Co.—Passenger 'buses and trucks.
Centaur Motor Co.—Peerless, Winton, Autocar, Oldsmobile, Cadillac, Pope-Toledo.
J. A. Cramer—Stoddard-Dayton, Mitchell.
Walter Hayes—White steamer, Jewel.
Imperial Motor Car Co.—Packard, Pope-Hartford, Buick.
G. H. Poppenberg—Rambler, Reo, Jackson, Premier.
Maxwell-Briscoe Co.—Maxwell, Mora.
W. C. Jaynes & Co.—Waterless Knox.
A. V. Hart, Rochester—Elmore, Columbus electric.
W. H. Barger—Waltham, Orient buckboard.
Buffalo Automobile Exchange—Franklin.
American Motor Truck Co., Lockport—Truck.
Genesee Motor Vehicle Co., Rochester—Corbin.
Ideal Runabout Mfg. Co.—Ideal.
C. M. Rodgers—Rapid trucks and 'buses.

Accessories.

Charles E. Miller—Automobile accessories.
National Battery Co.—Batteries.
Warner Instrument Co.—Warner auto-meter.
Buffalo Gasoline Motor Co.—Motors.
Acetyvone Co., New York—Gas generators.
James G. Barclay—The Auto-Meter.
Jaynes Auto Supply Co.—Prest-O-Lite tanks, Witherbee batteries, accessories.
Pennsylvania Rubber Co.—Tires.
Ennis-Ruff Tire Co.—Tires.
E. E. Denniston—Tops and bodies.
O. K. Machine Works—Sundries and accessories.
W. F. Polson—Auto accessories.
De Luxe Mfg. & Specialty Co.—Spark plugs.
Townsend Davey—DuBrie motors, Davey tire guard.
Knoll & Turgeon—Automobile insurance.
Travelers Insurance Co.—Insurance.
D. H. Lewis—Automobile route book.

Motorcycles.

Thomas Auto-Bi Co.—Motorcycles.
Neal, Clark & Neal Co.—Indian motorcycles and racycles.

THE "FLAG-TO-FLAG" MOTOR BOAT RACE.

NASSAU, N. P., Feb. 17.—The *Daggett*, owned and steered by John Haggerty of New York, yesterday was the first to arrive of the four official division contestants in the "flag-to-flag" motor boat race from Miami to Nassau. The *Daggett* arrived at 3 P.M.; the *Whiz*, owned by Thomas E. Norton, New Haven, arrived a half hour later, and the *Klondike*, owned by Charles Ball of Miami, arrived at 6 P.M., having lost the lead in a fog bank. The *Lee S.*, owned by A. P. Gerlach, has not yet reported.

The official start was given on Thursday morning, though originally scheduled for Tuesday morning, at which time the *Muriel*, entered in the name of the New York Motor Club, made its start. After a rough voyage, during which its engine went wrong and had to be repaired, the *Muriel* reached Nassau Friday noon, and those aboard it have filed a claim for first prize.

NEW JERSEY'S LAW MAY BE CHANGED.

TRENTON, N. J., Feb. 18.—Several amendments to the present Frelinghuysen automobile law are probable, if an amendatory measure recently introduced with the approval of the Associated Automobile Clubs of New Jersey meets with the favorable consideration which is expected. The amendments include the furnishing of registration tags by the State itself, thus insuring uniformity in size and appearance; the abolishing of the right to arrest without warrant, but increasing to twenty the number of State inspectors, and the recognition of registrations obtained in other States. The automobilists also will urge an amendment to a bill now in progress of passage whereby there would be a white light in front between the wheels and a red light in the rear instead of two side lights. Before action is finally taken it is probable there will be other changes proposed.

WORCESTER'S FIRST SHOW.

WORCESTER, MASS., Feb. 18.—Worcester's first automobile show, in the State Armory, opened this afternoon with all decorations and exhibits except four in place. These were delayed owing to a freight wreck between here and Boston, in which four of the cars figured. A large crowd thronged the drill shed afternoon and evening.

The big hall resembles a palm garden, and to enter the show was like stepping from a New England Winter into a Florida Summer. The ceiling and girders are covered with red, white, and blue streamers and bunting. The walls are covered with crimson burlap, decorated with frieze of white covered with red poinsettias, a crimson California flower. The floor of each exhibit is covered with a green flowered burlap of new design, and each space is marked off with Southern palms, which stand ten feet and more high.

The latest models of automobiles and the other exhibits of accessories are ranged in three lines of booths on each side of the drill shed and down the center, every available inch of space being filled. There are over 100 cars in the exhibition, nearly all of American make, touring cars predominating.

The show is for the benefit of all the militia companies which have quarters in the armory, and each company shares in the



WORCESTER'S SHOW AS SEEN FROM ARMORY GALLERY.

profit. Manager Frederick N. Prescott deserves credit for the manner in which he arranged for the exhibits, many of which came by special train direct from the Chicago show. It is Worcester's first annual and will surely be repeated next year, for every Worcester dealer is represented and each says the show will have to be an annual affair from now out.

The Atlantic Motor Boat Company has a couple of its craft on exhibition, and one of them will be awarded at the end of the show to the militia company receiving the greatest vote.

The exhibitors at the Worcester show are as follows: Norton Emery Company, ground automobile parts and grinders; George W. Knowlton Rubber Co.; Lincoln Holland; Alsten & Goulding; Coes Wrench Co.; Park Square Automobile Station, Boston; C. A. Harrington; George F. Jewett; Apperson Bros., Boston; Brunell Automobile Co.; Boston Motor Co.; Pond Automobile Co.; White garage, Boston store; Iver Johnson Sporting Goods Co.; Birney A. Robinson; Harrington Automobile Station; Page Electric Company; John S. Harrington; George H. Phelps; Pilot Garage; Palace Automobile Station; Norcross Automobile Company; Prentice Motor Car and Supply Co.; and Worcester Pressed Steel Company.

Pittsburg (Pa.) councils have passed an ordinance to buy six automobiles to cost \$30,000, and expend \$21,000 more for the erection of a garage to store them. The purpose is to provide automobiles for service in the parks—especially Schenley Park.

BOSTON'S SHOW IN AN ORCHARD.

BOSTON, Feb. 18.—New York has had its Italian and Swiss gardens and Chicago has seen Manager Miles' automobile art gallery; now comes Boston's turn to show something new in the way of a setting for its annual automobile and power boat show that is to open in Mechanics' Building and Horticultural Hall, March 9, and continue through the following week.

For the fifth annual show of the Boston Automobile Dealers' Association the interior of Mechanics' Building will be transformed into an old-fashioned New England apple orchard and garden. The 1907 product of the automobile factories of America and Europe will be exhibited under the branches of a large number of apple trees in full bloom and under lattices loaded with rambler roses, while all through the great halls pots and baskets of early spring flowers will add to the garden effect of the whole.

Grand Hall, as usual, will be the central feature of the decorative scheme, and to adorn this spacious hall an orchard in Newton has been despoiled of its trees. Some twenty immense trees have been cut down, trunks, branches and all, and upon these the decorators will place leaves and blossoms, and under them the automobiles will be exhibited. The central feature will be the band stand, built of lattice work like a nest in the branches of a huge apple tree, the stand being supported by the branching limbs, and the whole covered by the flower-laden twigs above. This stand will be supported by the trunk of a tree, inside of which a spiral staircase will furnish a means of entrance and exit for the musicians.

Over the stage will be an arch of electric lights, each covered with a cluster of apple blossoms and around the fronts of the first and second balconies pink flowers will be massed, relieved by garlands of greenery. Overhead will be a canopy of the national colors, while thousands of electric lights along the beams will illuminate the entire scene. The exhibition spaces are to be divided by railings of white and mahogany, and all the signs will be of white and gold, with uniform lettering and of uniform size. At the aisle ends of the railings dividing the spaces are to be posts carrying large baskets of artificial flowers. The back walls under the balcony and the posts are to have coverings of green burlap and a green matting will be used to cover the floor of the spaces. To add to the orchard effect, twenty small cherry trees in full bloom are to be placed upon the first balcony railing all around the hall.

In Exhibition Hall, which as well as Grand Hall will be devoted exclusively to the exhibition of automobiles, the decorative effect will be that of an old-fashioned garden adjacent to the orchard. Lattice work is to be used to cover all the beams and posts and to form arches across the main aisle, and through this will twine thousands of yards of rambler rose vine, with countless red blossoms. Intertwined with the rose vine will be something like 4,000 electric lights. The spaces are to be divided as in Grand Hall with white and mahogany railings, and the signs are to be of the same style and character.

The basement, which is devoted almost exclusively to the exhibition of motor boats and their accessories, is to have an entirely different treatment, the intention being to give it as much of a nautical atmosphere as possible.

In the balconies, where the accessories exhibits are to be located, the general decorative scheme is a liberal use of bunting in the National colors with green divisional fences and green matting on the floors.

Horticultural Hall, which is to be used in connection with Mechanics' Building for the show, and in which commercial vehicles and some pleasure cars will be shown, will be treated less elaborately, though in harmony with the other building.

The decorations will not be limited to the interior of the buildings, for on the outside of Mechanics' Building Manager Campbell is planning one of the most extensive electrical displays ever attempted in this city.

NEW TRAFFIC RULES FOR PARIS.

By PHARE.

PARIS, Feb. 11.—Although I am the owner of several large and luxurious automobiles and maintain in my employ an army of chauffeurs, all of whom are saucily uniformed and trained to wear that supercilious, overbearing countenance which harmonizes with their master's rich and princely station, let me for an instant whistle the tune of the proletariat, pipe the plaint of the simple pedestrian, who must needs go afoot.

The "simple piéton," he who walks, has no right on that particular portion of the earth's surface on which Paris is built. Perhaps some mute clause of the Napoleonic code accords him a legal right to cross the street now and then, when his occupation calls for such a move, but in the practical daily routine of existence in the delightful metropolis he finds himself obliged to be on the jump from one sidewalk to the other, with a starting crank or a cab shaft pole always close to his spinal column. The situation of the pedestrian in Paris is quite in keeping with that beneficent designation in French law by which the noble citizen is always guilty until he proves himself innocent, and thus, in case of danger, "it's up to him" all the time.

Vehicles have all the rights in Paris. Policemen occasionally wave white enameled cotillon favors at the drivers, in an almost rude or menacing manner, as if to warn them against doing it again, but up to the present no naked eye has been able to detect anything but much comic opera costuming in the play for the public's protection. Five or six years ago the police department evolved the wonderful scheme of installing crossing "cops" at a few of the busy intersections. This system was inaugurated in Webster, So. Dak., just before the County Fair of 1860. It was soon found to be a good thing in Paris. It is in general operation at about a dozen of the congested street intersections, where the traffic is so dense that no vehicle can go faster than an A. D. T. walk anyhow. Therefore, you see, it is a great success, and citizens point with pride at those stalwart, four-foot policemen who, by raising pretty little white candy sticks, arrest the mad rush of the city's surging throng. Touching is the scene of a frail woman threading her way across these dangerous sections of the boulevard while Monsieur Officer Murphy benignly watches her movements to see that her dress does not trail in the mud.

In the wide avenues, where all kinds of machines on wheels can run as fast as their drivers care to let them run, there are policemen who, about once a month, glance at the rear numbers of flying autos, jot memoranda in notebooks, make mistakes as to the numbers, of course, and summon somebody to the police station two months later.

The avenue des Champs-Élysées, in accordance with the original Gallic plan of subdivision, is in three parts—two sides and a middle. Vehicles may take to the sides or the middle, as they choose. In the middle, theoretically for the use of the public, are "refuges." No pedestrian ever reached any of these havens, but hope springs eternal and comes up smiling like a Truffault suspension, and the "refuges" are there anyway.

But, ho! New regulations are proposed. Something is to be done by the police in the Champs-Élysées. Automobiles must be driven down the middle of the avenue, while cabs, bicycles, coaches and other donkey carts are to have the right of way on the two sides. This will work a change—for the vehicles. How much of an amelioration will accrue to the simple pedestrian does not remain to be seen, as it is already plain. The simple pedestrian, instead of being able, now and then, to get part of the way across the avenue, will not be able to even leave the sidewalk. This will constitute an improvement after all, as the simple pedestrian will incur less danger.

The famed and boasted beautiful avenue des Champs-Élysées remains, however, the grandest public thoroughfare in the world, and of which Paris is justly proud. Incidentally it may be remarked that 200 persons are run down by vehicles, and either killed or badly injured, in the avenue des Champs-Élysées every year, sometimes more but never less.

THE NEWS FROM TIRETOWN.

AKRON, O., Feb. 18.—The Firestone Tire and Rubber Company may go into the United States Supreme Court to secure a final review on the decision of the New York Court of Appeals, which was adverse to the company on manufacturing tires under the Grant patent. The Diamond Rubber Company and the B. F. Goodrich Company are vitally interested in the decision also, as they make the same kind of internal wire tires, and if the suit against the Firestone Company can stand, one can also stand against the other two companies. The Goodyear Tire and Rubber company claims to be protected, however, under a decision in a similar case brought against it by the Consolidated company, and which the Goodyear Company won. The decision, however, will have no serious effect on the tire business in this city, as the companies mentioned make other tires, including cross wire tire, that will not be barred.

The Firestone company has completed preparations for entering what is expected to be the biggest year in its history. The office room of the company has been enlarged and the factory's facilities increased. The greatest enlargements, however, are being made and planned by the Diamond and Goodrich companies, which are erecting new buildings to care for the increased business.

The total actual capital engaged in the rubber manufacturing business in this city, much of which consists of the tire trade, is estimated conservatively at \$17,796,000, with the Goodrich company leading with \$9,000,000, and the Diamond following with \$5,000,000. The Diamond company has just authorized an increase in capitalization from \$3,500,000 to \$4,000,000, and taken steps to further increase the capital stock to \$5,000,000 to care for the increased demands for money in the business.

Fred W. Work and B. J. Maxson, of the Goodrich company, will leave, May 1, for a trans-continental trip in a 40-horsepower Oldsmobile. They will start from New York city, and, after spending a short time in California touring, will come back as they went. This will be the longest trip ever attempted by Akron men. The trip will be solely for pleasure, and no attempt to go against time will be made.

CRATING MUST BE CONTINUED.

For the present, automobilists crossing the Atlantic must crate their machines. The Automobile Club of America, the American Automobile Association and other representative bodies have met a committee of the Transatlantic Associated Trade Conferences, without being able to convert that body to their views. The argument of the shipping people was that steamers are at present so constructed that it would be impossible to accede to the demand. They contend that to protect a car it would be necessary to build a bulkhead right across the vessel, since no ordinary partition could hold the cargo from sliding down on the cars in heavy seas. Such a bulkhead would need to be removed on western trips to make room for immigrants. It was shown that a single car would occupy the space of eight immigrants paying \$30 each for passage. The steamship companies could not see their way clear to sacrifice \$240 in passage money for the sake of carrying an automobile uncrated at the rate of about \$80. It was admitted that on some of the larger boats with high decks it might be possible to make provision for uncrated machines, but the fact that the number of cars carried eastward on a single trip never averaged more than five, was put forth as a reason for not setting apart a portion of the deck between two bulkheads for this purpose. If a regular traffic of twenty or thirty machines were assured, something might be done.

Automobilists present at the conference were: Albert R. Shattuck, chairman of the runs and tours committee; Waldron Williams and A. L. Westgard, for the Automobile Club of America; F. H. Elliott, secretary of the A. A. A.; Alfred Reeves, general manager of the A. M. C. M. A.; and J. S. Marvin, traffic manager of the A. L. A. M.



THE ROE NOVEL MOTOR SCOOTER VIEWED AT CLOSE RANGE.

MOTOR SCOOTING ON THE ICE.

For exciting, blood-warming, nerve-testing sport, automobile road racing must take second place to the new game of motor scooting. It was a thrilling sensation, stretched on the deck of a swift ice yacht, to glide over the frozen surface at the speed of a bird and with the same ease of motion. But with the motor scooter you can give the sailing craft a good start, catch up the rear one, talk to her skipper, rush ahead, pick up the faster boats, and, with a final burst of speed, run right down the line of the fleet and finish before any of them. It is to Nathaniel Roe, of Patchogue, L. I., that sportsmen owe the new sport. Roe took an ordinary 14-foot scooter, with sharp prow and half rounded stern, fitted it with a light gasoline motor and special drive of his own designing, and surprised the Great South Bay men by leaving their sail-driven craft as if standing still. The hull has no distinctive features, being one of the typical scooters seen daily on the Great South Bay. In the forward end of the cockpit is fitted a very light four-cylinder air-cooled gasoline motor developing about 20 horsepower. The engine is of French origin, originally served on a French airship, was exhibited in the States, and sold when its owner found himself in financial difficulties. The motor is mounted on heavy rubber cushions to reduce jar to the mechanism, and is attached only at its forward end. A propeller shaft, without a cardan joint, drives through a bevel gear an ordinary bicycle wheel with reinforced steel rim in which has been riveted a number of case-hardened steel studs about half an inch long. This driving wheel runs within a center board case. By means of a lever at the rear of the case the engine, driving shaft and wheel can be tilted slightly, thus causing the studs of the driving wheel to bite firmly in the ice, touched slightly, or revolve freely. The gasoline tank being right astern, a flexible joint has to be provided to the carbureter; all other parts are contained on the engine frame, and in no way suffer from the tilting of the engine. Immediately behind the driving wheel is the steering apparatus in the form of an automobile steering wheel. It operates by means of wire cables passing over the gunwale to port and starboard to a long, fin-shaped rudder of steel under the boat. When running free the rudder is not on the ice, but a touch of the helm will, by means of its pivoted arrangement, bring the rudder into contact either to port or starboard.

No danger is incurred by the boat running into water, for the wheel casing is the same as that of a centerboard, and does not allow water to enter the craft. When it is desired to run across country a light frame with a pair of bicycle wheels is slipped under the motor end of the boat. The stern is then hitched on to the rear of an automobile and the boat is towed.

Not only is the boat fast on ice, but she does equally well on hard-frozen snow. On the Great South Bay a speed of 60 miles an hour has been attained; with higher gearing it is believed that the boat could travel at the rate of 100 miles an hour. In-

dications point to motor scooting becoming an important sport, and a very keen rival of sail-driven ice boats. A gasoline scooter club is about to be formed, and orders have been given for the building of five of these craft. Nathaniel Roe can already count as converts to this interesting sport such well known automobile figures as Jefferson de Mont Thompson, Harry Payne Whitney, and A. R. Pardington, all of whom intend to own motor scooters in the near future.

POPE CO. ENTERTAIN LEADING TOLEDOANS.

TOLEDO, O., Feb. 16.—The Pope Motor Car Company has as its guests this week about a hundred members of the Toledo Chamber of Commerce. The monster works of the automobile company was visited, each department being thrown open to the visitors for their pleasure and edification. Competent guides were furnished and every detail about the manufacture of an automobile was explained. The visit was one of a number the Chamber of Commerce is taking to the leading industries of the city for the purpose of imbuing the members with a sense of Toledo's importance from a manufacturing point of view.

AN INDIANA MOTORING PROPOSITION.

INDIANAPOLIS, IND., February 18.—On the fate of a bill now pending before the Indiana Legislature depends the success of a huge automobile venture that is, incidentally, a novelty in the automobile world. It is nothing less than an automobile railway, and if the bill becomes a law this new industry will rival the interurban railroads that are now so prominent in Indiana.

Z. T. Sweeney, State Fish and Game Commissioner, together with a number of Southern Indiana capitalists, are back of the scheme. They propose, as a test, to build an automobile railway for a distance of ten miles between Seymour and Brownstown. The rails will be of concrete, but aside from this little information has been given out, as patents have not yet been obtained.

A COMMODIOUS NEW YORK SALESROOM.

A valuable addition has been made to New York's Automobile Row by the opening of the American Mors premises at Broadway and 54th street. It is only fitting that an industry which is rapidly becoming one of the most important in the country should be housed in the best quarter of the city and have a home in keeping with its magnitude. The St. Louis Car Company's new premises in New York comprise offices, salesrooms and garage, all very commodious, luxuriously appointed, and artistically decorated. There is ample space for the display of all the 1907 models of the American Mors, and a complete exhibit is always on hand. Although the season can hardly be said to have begun, L. A. Hopkins, manager of the branch, reports a gratifying number of sales and is looking forward to a record year for the American Mors.



NEW YORK SALESROOM OF THE AMERICAN MORS.

NEWS AND TRADE MISCELLANY.

The Electric Automobile Company, of Savannah, Ga., has elected officers for the ensuing year as follows: President, Joseph S. Walker; vice-president, R. M. Hull; secretary and manager, George A. Mell.

The Orlando E. Weber Company, Chicago, representatives for the Pope lines, has leased the premises at 1322 to 1326 Michigan boulevard for fifteen years. The store has a frontage of 60 feet and is 171 feet deep.

The price of the Berliet 40-horsepower touring car is \$7,500 and the 40-horsepower limousine or landaulet \$8,500. In a recent number of *THE AUTOMOBILE* the price was stated at \$8,500, but the type of body was not clearly indicated.

In a broad challenge issued several days ago, E. P. Brinegar, the San Francisco agent for the Oldsmobile, offered to match one of the 1907 Oldsmobile touring cars against any car of its class in an endurance run from Los Angeles to San Francisco.

Henry Nyberg, manufacturer and dealer in automobiles, will have new building at 2437 and 2439 Michigan boulevard, Chicago. A six years' lease has been entered into by which the owners will erect a two-story building, 50 by 165, to be ready for occupancy May 1.

An extensive top-making department is now being carried on by the Capital Auto Company, of Indianapolis. A specialty is also being made of folding wind shields and Reliable jacks. Originally capitalized with \$25,000, the company has recently increased its capital stock to \$50,000.

Columbia cars have their motors tested not only on the block and in the finished car, but after assembling they are connected to the main shafting and limbered up. In this manner the various parts are run in so that when a purchaser receives his car he has the assurance that his engine will run smoothly.

Having received numerous demands for catalogues from all over the country addressed to the Huntington Auto Company, Bartlett & Frazier, of Huntington, Ind., are obliged to make a public announcement that these must be intended for some other car manufacturer in another State, doing business under this name.

The Pontiac Iron Works Company is a co-partnership which will equip a new factory and machine shop in Pontiac, Mich., for the manufacture of a gasoline engine shortly to be put on the market by a Detroit firm. A. M. Skinner and E. G. Meyer, of Grand Rapids; W. H. Higgin, of Saginaw, and E. F. Skinner, of Detroit, will constitute the firm.

There are advantages in an automobile factory being located in a small place where the authorities do not have as much organization and discipline as in a big city. At Ardmore, Pa., the authorities and the road testers of Autocars get along like cronies. They are both reasonable and it is said that never has a road tester from the factory been arrested.

Thanks to the ingenuity of a Menominee, Mich., blacksmith, a couple of Escanaba autoists were able to proceed on their way a short time ago after having been held up by snow. The party had

passed Menominee on the way to Wallace, but had to return on account of deep snow. Then Joseph Beyer, a blacksmith, improvised a pair of runners for the front wheels and the auto was able to proceed.

To say that Michigan is full of automobiles which are worn out and ready for the junk heap would be putting it mildly. The fact, however, has been discovered since the auditor general has been sending out blanks for the description of personal property for the purpose of taxation. According to the value placed upon some of the machines by the owners even a Digger Indian could afford a whole trainload.

Lethbridge, Alberta, Canada, is to have the first automobile manufactory in Western Canada. The following have incorporated the company, which expects to turn out the first machine in a couple of months: President, M. Freeman; secretary, C. B. Bowman; mechanical superintendent, Howard Case; directors: Dr. Mewburn, L. M. Johnstone, T. M. Evans, L. Pabst, W. Henderson, Howard Case.

Joseph J. Mandery, the pioneer automobile dealer of Rochester, N. Y., seven years ago drove the first steam automobile through the streets of that city. Like other cities Rochester claims more automobiles in proportion to its population than any other city in the country. Mr. Mandery asserts, as a result of his experience, that it was more difficult in the pioneer days to sell a \$750 steamer than it is to dispose of a \$5,000 automobile to-day.

A splendid example of the utility of the automobile on country roads in the worst weather is shown by the thirty-miles trip from Aguilar to Trinidad, Col., performed by a Model D rapid twelve-passenger automobile. A blizzard was blowing all the time, street cars, trains and all other vehicles were severely handicapped, but the auto successfully came through its test. No other conveyance was able to make the journey.

A. M. Andrews, who conducted in the First Regiment Armory, Chicago, last fall what was announced as an "automobile parts show," gives out information that he has leased the same armory for September 21-23 and intends to hold another show for the "National Association of Automobile Parts Manufacturers," of which he appears to be the general manager, stating that he was named to take charge of the show at a meeting held some time ago.

When the Chicago branch of the Ford Motor Company was burned out offers were received from nearly every member on the row. Temporary quarters were taken in the new Furniture Exchange Building and in a very short time business was going on as usual. The loss on the building and stock destroyed by fire is estimated at \$100,000. C. A. Eckstrom will be the architect for the construction of the new store, which will probably be a three-story building, at the old location, 1442-1446 Michigan avenue.

The first automobile show in America was held September, 1900, at the Washington Park Track, Chicago. Practically all of the makers then doing business exhibited, and it is a curious fact that, of all the exhibitors, the Winton Motor

Carriage Company is the only one now doing business in the same product, in the same name, in the same city, and under the same owners as then. Another interesting fact is that Winton cars won every race in which they started at the show and established a long string of records that stood for several years.

A new use for the automobile engine was recently found by the Buick Company, of Flint, Mich., when the pattern room of the experimental department of the factory was obliged to shut down owing to a break in machinery at the power house. Then the novel plan of employing an auto taken from the stock to do the work was employed. A 22-horsepower stripped car was used. A belt ran from the transmission wheel of the machine to the line shafting on the ceiling, supplying power enough to operate a score of bench machines.

A side light on the value of the automobile for difficult service is shown by the letter received by the Rapid Motor Car Company from the Trinidad Transportation Company. The letter states that the Rapid twelve-passenger car, after running on the streets and many outing trips into the mountains, was, on December 23, 1906, put on a regular run connecting the towns of Aguilar, Hastings, Tabasco, Suffield, Bowen, etc., giving a regular daily service of seventy miles, seven days in the week, carrying full load, fifteen passengers in and sixteen out, over natural mountain roads at an average speed of ten miles an hour. During all the time not a single replacement was made on the machine.

A receiver has been asked for by Paul Picard for the Tileston-Picard Company, formerly Chicago agents for the Renault. According to the claims of Picard he entered into an agreement with C. A. Tileston, March 8, 1906, to take charge of the Chicago agency and for his services he was to be paid a salary of \$250 per month and a share of the profits. In September, he states, the company was unable to continue its agreement with the manufacturers of the Renault and the agency was closed. Picard further asserts that Tileston, who was the president of the agency, and Charles F. Terhune, secretary, are withholding his share of profits made by sales of automobiles, and he asks that an injunction be issued restraining them from using any of the agency's books or papers.

Elaborate and effective measures are taken by the George N. Pierce Company, at Buffalo, for testing every part used in the construction of the machines. There the plant is divided into many departments, with a foreman-inspector in charge of each. These foremen have nothing to do except see that every single article turned out from their department is perfect; and they are held responsible. Thus there is practically an inspector for each group of parts in the machine. When a Great Arrow is completed it is passed over for road testing before being shipped. If, in the strenuous testing on the road, any little thing is found at fault, it is possible to lay the hand on just which man in all that great factory is responsible. The result is that when a car is given to the road testers it is really ready for use.

The regulation method of testing newly constructed gasoline motors is to belt them up to a shaft or run them independently on gasoline. In both cases

there is a certain amount of expense, for the engines have to be watched and their fuel consumption is not negligible. At the Elmore Manufacturing Company's factory, at Clyde, Ohio, the well-known Elmore two-cycle motors are made to test themselves and at the same time furnish the power to run the factory. They are fed with coal gas, and their running is so steady that the incandescent lights show as little variation as with a dynamo run with steam power. Experiments have shown that the Elmore motor can be run satisfactorily with almost any kind of fuel. Some time ago at the Detroit Y. M. C. A. motor class an Elmore was run on gasoline, kerosene, alcohol, brandy, and finally a mixture of all four liquids, without any alterations or adjustments. Alcohol can be used with very good results, its price being the only drawback to its general adoption.

NEW AGENCIES ESTABLISHED.

Knox cars are now handled in Newark, N. J., by the Ellis Motor Car Company of that City.

Dragon cars will be handled in Cleveland, O., by the United Motor Car Company, with headquarters at 6112 Euclid avenue.

Bartlett & Frazier, of Huntingdon, Ind., have been appointed agents for the Buick line of automobiles in the central eastern counties of Indiana.

The Standard Lamp Manufacturing Company, 43 South Canal street, Chicago, and Charlotte, Mich., has opened a branch store at 1670 Michigan avenue, Chicago.

The Union Automobile Company, of Bellingham, Wash., has been organized with a capital stock of \$10,000 by H. J. and G. E. Crockett. The company will handle the Cadillac.

Premises at 248-252 Jefferson avenue, Detroit, will be occupied by the Winton branch house pending the erection of a modern garage. Thos. Winton Hender-son, formerly of Paris, Philadelphia and New York, is in charge.

The Elmore Manufacturing Company, of Clyde, Ohio, makers of the well-known two-cycle Elmore line, has placed the Chicago agency for the Elmore with Owen H. Fay, 245 Michigan avenue. Mr. Fay's establishment, which is one of the best known auto livery establishments in Chicago, occupies the quarters formerly the home of the Chicago Automobile Club.

During the Chicago show the Bartholomew Company made arrangements for the following new agencies: W. B. Vandecar, Grand Rapids, Mich.; O. G. Roberts & Co., Columbus, Ohio; Allegheny Automobile Co., Allegheny, Pa.; Guy J. Hartwell, Mobile, Ala.; Migliavacca Company, Seattle, Wash. All of the above parties will handle a full line of Glide four and six-cylinder cars during 1907.

Branches have recently been opened by the H. W. Johns-Manville Co., of New York City, manufacturers of asbestos, magnesia and electrical products, at New Orleans, Dallas and Baltimore, so that there are now sixteen branches throughout the United States. A new branch has just been opened at 214 Main street, Buffalo, consisting of large retail shops, offices and warerooms, to be under the management of Geo. A. Schmidt.

PERSONAL TRADE MENTION.

On February 4 H. L. Warner ceased all connection with the Muncie Auto Parts Company, of Muncie, Ind.

Roger B. McMullen has been appointed general sales agent of the Hydrant Pressed Steel Company, of Cleveland, Ohio.

Bartlett J. Smith, who has been devoting considerable time to the study of the mechanical side of S. & M. Simplex cars, has joined the Smith & Mabley sales forces.

Andre Massenat, general manager of the American branch of the Panhard Company, has returned to New York from France, where he has been spending a few weeks at the Panhard works.

Webb Jay, who recently resigned the managership of the Chicago branch of the White Company, it is stated, will affiliate himself with a manufacturing house in New York State, which will enter the automobile trade, building a steam car. The management of the automobile department has been tendered to Mr. Jay.

A. B. Barkman has succeeded C. W. Kelsey, resigned, as Eastern sales manager of the Maxwell-Briscoe Motor Company, Tarrytown, N. Y. Mr. Barkman has been connected with Maxwell interests for some time past, and is well remembered as a prominent figure in the cycle trade. He was in charge of the bicycle interests of A. G. Spaulding & Brothers for many years.

A recent addition has been made to the selling force of the American Mors branch of the St. Louis Car Company in New York in the person of A. L. Bennett, formerly sales manager of Cryder & Company, the United States representative of the French Mors car. Mr. Bennett was formerly with the Dietrich Company, and later was assistant manager with the Société Mors, American branch.

C. W. Kelsey, who has been actively identified with the Maxwell-Briscoe Motor Company's interests as sales manager for several years, feels that an undesirable impression may have been created on account of an announcement made last week regarding his resignation from the Maxwell-Briscoe Company. Mr. Kelsey states that the most pleasant relations exist between the Maxwell-Briscoe Company and himself; that his resignation is not due to any friction between the two, and he has had the step in contemplation for some time, his recent trip abroad having been with a view to gather any information regarding the new projects which are now forming and in which he has important interests. Officers of the company confirm this statement. It is known that Mr. Kelsey has in view embarking in the commercial vehicle business. Plans which have practically been completed insure the announcement, at a very early date, of a large company which will devote itself (in the more important cities of the United States, beginning with New York, Philadelphia and Boston) to a development of municipal delivery systems. This company has large capital behind it, and has already practically secured control of a large and well-equipped manufacturing plant. The new company, of which Mr. Kelsey will be the executive head, will not place any cars on the market, but will confine itself to manufacture and operation.

PRICE OF COLUMBIA MARK XLIX.

Through an error the price of Columbia Mark XLIX, 40-45-horsepower touring car was given in a recent advertisement as \$4,200 instead of \$4,500, the correct figure. That current automobile advertising is extensively read was well shown by the numerous inquiries received by the Electric Vehicle Company asking whether the price of Mark XLIX had been changed.

WAYNE AND DRAGON AGENCIES CONSOLIDATED.

One of the largest recent automobile deals in the metropolitan district was put through, February 14, when the Wayne and Dragon New York agencies were consolidated. Messrs. Bishop, McCormick & Bishop turned over their New York City interests to the Kull Automobile Company, of New York, with A. L. Kull as general manager. The Kull company will move from its present address to the present Dragon salesroom, No. 1677 Broadway, before March 1. The details of the deal were arranged by President John Kane Mills, of the Dragon Automobile Company, and A. L. Kull, who has been handling the Wayne car in the East. The transaction was more or less complex owing to the several firms and large financial interests involved. The Brooklyn and Long Island City agencies of the Dragon will remain with Bishop, McCormick & Bishop, and that firm will also handle the Wayne car in that territory in the future.

DOINGS OF THE PENNSYLVANIA RUBBER COMPANY.

The demand for the products of the Pennsylvania Rubber Company, of Jeanette, Pa., has led to the appointment of a general sales agent and the opening of two additional branch houses, one in Cleveland and the other in Detroit. Roger B. McMullen, one of the best-known men in the trade, has been made general sales agent for the Pennsylvania tire. He was formerly manager for the American Motor Car Manufacturers' Association, general sales agent for A. O. Smith & Co., of Milwaukee, and for five years prior to 1898 was a jobber of bicycle parts. Mr. McMullen is located at 1241 Michigan avenue, Chicago.

The new Cleveland branch occupies an entire building, and is in charge of C. W. Moody and W. T. Walker, as associate managers. Mr. Moody has been closely identified with the rubber trade for upward of a dozen years, and is widely known. Mr. Walker, for the past two years, has been connected with the Pennsylvania Rubber Company's New York house, and prior to that was in the automobile business in Indianapolis.

The Detroit branch is well equipped. O. H. Joy had 18 years' service with the Wolverine and Diamond Rubber companies, having been secretary and treasurer of the former, and in the manufacturing and sales departments of the latter. Associated with him is George O. Goble, a mechanical expert and a specialist in the manufacture of jarrings.

The American branches are located in New York, Chicago, Philadelphia, Boston, Buffalo, Atlanta, Cleveland and Detroit. The large English and continental trade is handled from the London branch, located at 26 City Road, this end of the business having assumed unusual proportions during the past year or so.

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THE MOTOR BOAT HAS ITS OWN GARDEN SHOW

By R. F. KELSEY.

DEVELOPMENT of the explosive type of motor for marine purposes has been coincident with its development for automobile, but in somewhat different lines and in keeping with the conditions governing the uses to which it is put. Scarcely ten years have passed since the crude productions of the pioneers in the industry were fitted to a few hulls and launched with some trepidation upon the sea of experiment, and it is only within the past five years—or to be more exact, the past three years—that the marine motor has reached the advanced state of development commensurate with the requirements of present day conditions.

Of necessity a radical change has been necessary in the design and construction of hulls. Power above decks, as represented by sails, and power below decks, as represented by motors, called for hulls different in character, and the working out of problems by a slow and costly process of elimination.

How well this has been accomplished has been exemplified to a nicety at the Motor Boat Show which closed this week in Madison Square Garden, New York City, after a week of splendid success, both from the standpoint of business transacted and patronage by the public.

The exhibition was the first distinctive motor boat show held in the metropolis, the sportsmen's exhibit, which has heretofore been held in conjunction with it, having been discarded as a feature. The National Association of Engine and Boat Manufacturers had full control of the show, and as the organization is comprised of the oldest and most firmly established houses in the country, the exhibits were thoroughly representative and varied.

Pleasure craft, of course, predominated; in fact, practically comprised all that was shown, and the infinitely wide range of design attainable in this category presented a fine field for



FROM THE CENTRAL POINT OF OBSERVATION THE SHOW PRESENTED A FULL COMPLIMENT OF UP-TO-DATE CRAFT.



"LYDIA," "CACTUS II," "NORKA," AND "AIDA" MODELS.
Exhibited by the Williams & Whittlesay Company, Steinway, N. Y.

study for those nautically inclined. The absence of purely racing freaks was noticeable, the trend of design seeming to lie in the direction of trim, substantial-looking hulls, so built as to admit of high speed if suitably horsepowered.

Increasing Popularity of Trunk Cabin Cruisers.

In contrast with this type, the cabin cruisers, with sea-going properties, formed a pleasing relief with their roomy cabins and homelike accommodations, to their slenderer, fleetier sisters. Cabin cruisers are rapidly gaining in popularity, with those who like to venture off shore out of sight of land, and are now built in a distinctive type from 27-foot length upward. Seaworthiness, not speed, is their chief characteristic. They are full-bodied, moderate in beam, of full wide stern, and the most advanced type shows relatively small displacement aft, the deadwood of the keel reaching almost to the waterline, and the line of recession aft on the bottom commencing about amidships.

The installation of a power plant in a craft of the above type has always been more or less of a problem, but it is best exemplified in a location at the rear of the cabin, about two-thirds of the way aft. This allows short reaches for the controlling levers which should be handy to the helmsman, who necessarily should be able to control the engine of a boat of this type at all times and on all occasions. It should be remembered also that the wheel in the type of boat mentioned must necessarily be located at end of cabin above deck, and its immediate proximity to the motor is desirable.



THE ELCO "EXPRESS," AN UP-TO-DATE PLEASURE CRAFT.
Exhibited by the Electric Launch Company, Bayonne, N. J.

Necessarily the larger type of motor boats could only be shown by miniature models, and the exhibit of these showed tour—the *Aida*, 80 feet; *Lydia* and *Cactus II*, 75 feet each, and *Norka*, 67 feet. All of these are full trunk cabin yachts, and range in speed from 20 miles per hour in the *Aida* to 17 miles per hour in the *Cactus II*.

Steel boats, shown in variety at several exhibits, demonstrated a marked improvement in design over last year's models, also superiority in construction. They embody distinct characteristics peculiar to the nature of the body material, but present no difficulty in their ready adaptation to power propulsion; in fact, their increasing numbers prove a widespread popularity.

A newly-named model for the coming season is the high-speed "runabout," a semi-racing type of boat, fitted with lightweight highly-developed motors of well rated power. These boats are made in popular lengths, the 21-footer predominating in the exhibits made. In power-driven yacht tenders a tendency is shown among builders to combine the large carrying capacity of the ordinary tender with the speed and convenience of the runabout type mentioned above. One type shown was equipped with 25-horsepower motor, has a guaranteed speed of fifteen miles per hour, and a total weight of only 1,350 pounds—a remarkable combination for a serviceable craft.

Selling Price of Products Meets All Purposes.

The wide range of prices for fully-equipped motor boat outfits puts them within the reach of everyone's pocketbook. The lowest price quoted was \$94.50. This, of course, was for



DISPLAY OF STEEL MOTOR BOATS IN ALL SIZES AND TYPES.
Exhibited by W. H. Mullins Company, Salem, Ohio.



THE CHARACTERISTIC AND SERVICEABLE POWER DORY.
Exhibited by the Atlantic Company, Amesbury, Mass.

a very small boat, with a motor of minimum horsepower, but it told the possibilities of the industry and its ability to meet the widest range of demand. Moderate powered boats, from 18 to 25 feet, selling all the way from \$250 to \$1,000, according to finish, horsepower and equipment, formed the bulk of the popular-priced models in open boats. Above the range of one thousand dollars in price there are numerous stock models up to \$5,000, and above that price special designs prevail. Half cabin cruisers can be purchased as low as \$1,500, but the popular sea-going type, 31 to 40 feet in length, ranges from \$2,500 to \$3,500. The largest boat shown was a forty-foot full cabin launch, beautifully furnished, and finished in natural polished mahogany, a \$10,000 beauty.

As is the case with the automobile industry, manufacturers of supplies, fittings and equipment are finding a very productive field in the realm of the motor boat. The balconies were devoted to these exhibits and a number of others found space on the main floor to show their wares. The most rapid advance noted among the specialists is in improved methods of ignition and the development of electric lighting plants for power boats. Names familiar in the automobile sundry supply dotted the big Garden, demonstrating the common kindred business interest which dominates all motor-driven conveyances, whether terrestrial or aquatic.



POPULAR TYPE 31-FOOT CABIN CRUISING MOTOR BOAT.
Exhibited by the Racine Boat Mfg. Co., Muskegon, Mich.

NAVY CONVERTED TO MOTOR BOAT IDEA.

Rear Admiral Coghlan, U.S.N., paid a tribute to the value of the power boat in his remarks at the beefsteak dinner of the Motor Boat Club of America at Reisenweber's last Saturday evening. He said that while the members of the club were interested in the development of the motor boat from a pleasure point of view, he took a broader view of the future of the industry. To have mentioned a gasoline motor and its use by the navy a few years ago to any prominent naval officer would have caused a shock to the officer. Now the motor boat, with its internal combustion engine, is a recognized thing in the navy, the service having realized the advantages of the motor boat as an auxiliary for light and rapid work. The Admiral said that the motor boat show had been a revelation to him and to all the officers of the navy who had visited it, and he felt that its influence would result in advancing the motor boat not only as a pleasure craft but for business use everywhere.

A CEMENT ROAD ACROSS THE COUNTRY.

INDIANAPOLIS, IND., Feb. 25.—Ezra Meeker, who has just completed a trip over the old Oregon Trail in a prairie schooner with oxen, as he did 50 years ago, is advocating a road bed of cement from the Atlantic to the Pacific.

"Those who would say that this is a chimerical scheme should be reminded that 20 years ago the electric car was unknown," says Meeker. "It is less than 60 years ago since the first railroad was built into Indianapolis, and many persons at that time shook their heads at such a 'wild scheme.'"

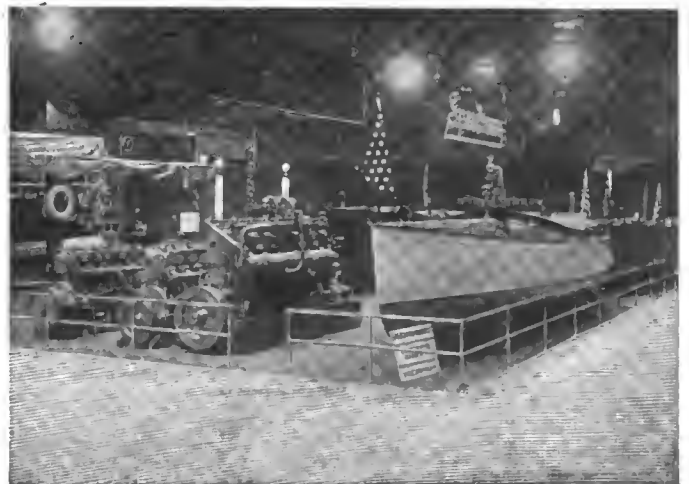


LARGEST ENGINE TO THE RIGHT IS 300-HORSEPOWER.
Exhibited by Standard Motor Construction Company, Jersey City, N. J.

POWER BOAT ASSOCIATION'S MEETING.

At the annual meeting of the American Power Boat Association, held February 20, at the Hotel Knickerbocker, New York City, officers were elected for the ensuing year and arrangements made for the race for the Gold Challenge Cup in August, the Gravesend Bay to Hampton Roads contest and the two cups given by the Brooklyn Yacht Club. The total membership of the association was brought up to forty-five organizations by the election to membership of the Hampton Roads Yacht Club, Bergen Beach Yacht Club and Maumee River Yacht Club. J. Norris Oliphant of the Thousand Island Yacht Club was re-elected president of the association, Anson B. Cole of the Manhasset Bay Yacht Club secretary, and J. H. McIntosh of the Columbia Yacht Club treasurer.

It has been arranged that the annual cruise shall be to Jamestown, to arrive there during the week of motor boat racing the first week in September. The route and details of the cruise have been left to the committee. For the Brooklyn races competition will be allowed during the entire summer, the boats making the best corrected time between Gravesend Bay and Hampton Roads to receive the cups. It was announced that the Thousand Islands Yacht Club had again challenged the Chippewa Yacht Club for the Gold Challenge Cup.



SPEEDWAY ENGINES AND SERVICABLE LAUNCH.
Exhibited by the Gas Engine & Power Co., Morris Heights, N. Y.

EXHIBITORS THAT DISPLAYED THEIR WARES

THOSE WHO BUILD BOTH BOATS AND ENGINES.

The Atlantic Company.....	Amesbury, Massachusetts	Pioneer Boat & Pattern Company.....	Bay City, Michigan
Electric Launch Company.....	Bayonne, New Jersey	Racine Boat Manufacturing Company.....	Muskegon, Michigan
Gas Engine & Power Company.....	Morris Heights, New Jersey	Smith & Mabley, Inc.....	57th Street and Broadway, New York
Grand Rapids Gas Engine & Yacht Co.....	Grand Rapids, Mich.	Stamford Motor Company.....	Stamford, Connecticut
Lamb Boat & Engine Company.....	92 Chambers Street, New York	Siegel Cooper Company.....	18th Street and Sixth Avenue, New York
Lozier Motor Company.....	55th Street and Broadway, New York	Standard Motor Construction Company.....	Jersey City, New Jersey
W. H. Mullen Company.....	Salem, Ohio	D. M. Tuttle Company.....	Canastota, New York
Michigan Steel Boat Company.....	Detroit, Michigan	Truscott Boat Manufacturing Company.....	St. Joseph, Michigan
New York Yacht, Launch & Engine Co.....	Morris Heights, N. Y.	Western Launch & Engine Works.....	Michigan City, Indiana
New York Kerosene Oil Engine Co.....	31 Burling Slip, New York	Williams-Whitteley Company.....	Steinway, New York
Palmer Brothers.....	242 Fourth Avenue, New York		

BUILDERS OF MOTORS ONLY.

American & British Mfg. Co.....	Bridgeport, Connecticut	International Oil Engine Company.....	38 Murray Street, New York
The Art Machine Company.....	Brooklyn, N. Y.	Lackawanna Motor Company.....	Newburgh, New York
Buffalo Gasoline Motor Company.....	Buffalo, New York	McFarland Foundry & Machine Company.....	Trenton, New Jersey
Brownell-Trebert Company.....	Rochester, New York	McMall Bralnard Engine Company.....	Produce Exchange, New York
Cushman Motor Company.....	84 Chambers Street, New York	Merchants' Engine Company.....	259 Greenwich Street, New York
James Craig, Jr.....	556 West 34th Street, New York	New York Safety Steam Power Co.....	114 Liberty Street, New York
Eagles-Howard Company.....	1321 Park Row, New York	J. V. Rice, Jr., & Company.....	Bordentown, New Jersey
Ferro Foundry & Machine Company.....	Cleveland, Ohio	Ramsey Engine Company.....	Philadelphia, Pennsylvania
Fairbanks Company.....	Broome Street, New York	Ramsey Manufacturing Company.....	Philadelphia, Pennsylvania
Gray Motor Company.....	Detroit, Michigan	F. A. Seltz Company.....	Newark, New Jersey
Holmes Motor Company.....	West Mystic, Connecticut	St. Clair Motor Company.....	64 Broad Street, New York
Hurd & Hagglin.....	36 Hudson Street, New York		

IGNITION APPLIANCES.

Atwater-Kent Mfg. Co.....	Philadelphia, Pennsylvania
Crown Battery Company.....	47 Warren Street, New York
Dayton Electrical Company.....	Dayton, Ohio
K-W Ignition Company.....	Cleveland, Ohio
Lincoln Electric Company.....	1 Union Square, New York
A. R. Mosler & Company.....	163 West 29th Street, New York
Manhattan Electrical Supply Company.....	19 Park Place, New York
Motinger Device Manufacturing Company.....	Pendleton, Indiana
National Carbon Company.....	Cleveland, Ohio
Pittsfield Spark Coll Company.....	Pittsfield, Massachusetts
Portable Electric Safety Light Company.....	Newark, New Jersey
William Roche Dry Battery Company.....	Jersey City, New Jersey
Richardson Engineering Company.....	Hartford, Connecticut
Chas. F. Spiltdorf.....	17 Vandewater Street, New York
Semi-Dry Battery Company.....	Harrison, New Jersey
J. S. Battery Company.....	New Rochelle, New York
Witherbee Igniter Company.....	541 West 43d Street, New York

LUBRICANTS AND LUBRICATORS.

G. W. Cole Company.....	141 Broadway, New York
McCord & Company.....	24 Broad Street, New York
N. Y. & N. J. Lubricants Company.....	14 Church Street, New York
Pedersen Manufacturing Company.....	636 First Avenue, New York

REVERSING GEARS.

Gies Gear Company.....	Detroit, Michigan
Perfection Reversing Gear & Supply Co.....	45 Vesey St., New York
Snow & Petrelli Manufacturing Company.....	New Haven, Conn.

BRONZE CASTINGS, PROPELLERS, ETC.

Wm. Cramp & Sons.....	Philadelphia, Pennsylvania
Michigan Wheel Company.....	Grand Rapids, Michigan

LAMPS, HEADLIGHTS, ETC.

Richardson Engineering Company.....	Hartford, Connecticut
Rose Manufacturing Company.....	Philadelphia, Pennsylvania
United States Battery Company.....	New Rochelle, N. Y.

MOTOR BOAT WHISTLES.

Watres Manufacturing Company.....	1133 Broadway, New York
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SUPPLY DEALERS.

C. D. Durkee & Company.....	2-3 South Street, New York
Chas. E. Miller.....	97 Reade Street, New York
George H. Terry Company.....	92 Chambers St., New York

MISCELLANEOUS EXHIBITS.

Barnett-Palmer Company.....	New York
Wm. Bruns.....	Jersey City, New Jersey
Etna Self-Heating Food Company.....	74 Broadway, New York
Energine Refining Company.....	5 Beekman Street, New York
Doubleday, Page & Company.....	133 16th Street, New York
Wm M. Gokey Shoe Company.....	Jamestown, New York
E. R. Hodgson.....	Dover, Massachusetts
J. W. S. Harding, Jr.....	226 Lafayette Street, New York
Wm. Hjorth.....	Jamestown, New York
Indian Exhibits Company.....	133 West 42d Street, New York
Monitor Speed Recorder Company.....	Cambridge, Massachusetts
Marshall Chemical Company.....	80 Williams Street, New York
W. L. Munson.....	874 Park Place, Brooklyn, New York
Pains Fireworks Company.....	12 Park Place, New York
Sand Sons Company, A. B.....	242 Water Street, New York
Sherwin, Williams Company.....	66 Broadway, New York
Spicer Universal Joint Mfg. Co.....	Plainfield, New Jersey
D. P. Van Gordon.....	Orange, New Jersey
Sulpho-Naphthol Company.....	125 East 23d Street, New York

BOAT AND ENGINE BUILDERS MEET AND DISCUSS PLANS

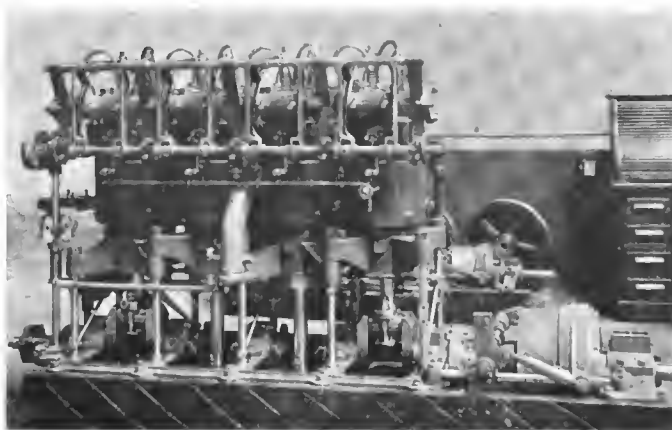
MONDAY afternoon, February 26, the National Association of Engine and Boat Manufacturers, under whose auspices the show was held, came together for its annual business meeting at the Hotel Breslin, preceded by a luncheon. An address of welcome was made by President Amory of the association, in which he reviewed what has already been accomplished and outlined what he considered good policy for the coming year. The following were elected members of the executive committee for three years: John J. Amory, H. N. Whittlesey, W. J. Reynolds, James Truscott and Walter Ferguson, Jr.

The matter of shows was naturally to the fore, and while it has not been actually so decided, it is definitely understood that

henceforth there will be an annual circuit of independent motor boat shows at New York, Chicago and Boston under the auspices of the National Association, the latter, in all probability, working in conjunction with the Western and New England associations. In connection with the motor boat carnival to be held on the Hudson River next September, it was decided definitely to hold a manufacturers' convention. The association has made arrangements to pay the transportation of out-of-town members to all meetings in order to insure bringing widely scattered interests together. Among other things discussed was that of the formation of a mechanical branch for the investigation of technical matters, also the founding of an experimental station.



DOCK FIVE-CYLINDER SELF-STARTING MOTOR. †



CRAIG MOTOR FOR THE 670-MILE RACE TO BERMUDA.

FEATURES OF MOTOR DESIGN SHOWN AT GARDEN

MOTORS here, there and everywhere appear to briefly express what may really be said to constitute the *pièce de résistance* of the Motor Boat Show. There are other things shown beside motors, to be sure, but for one sharp on lines and hull construction there are twenty on engine details, and, in consequence, the mechanical end of the show has really come in for the greatest share of attention. It has fully deserved it, too, for seldom in past years has there been such an attractive array of novel things to be studied and so much to be learned as has been the case with the show just past. For obvious reasons, the building of marine motors is still far from that settled stage of standardization that has marked the automobile motor as a whole for the past year or two, and, hand in hand with its trend toward that goal, there are being developed a number of systems which promise well for the future.

Primarily, the business of building marine motors meant the two-cycle type, but with the demand for, not alone greater power but also much greater speed, the four-cycle was resorted to with such success that there is now an almost equal division of opinion on the subject, not a few makers building both types. For moderate powers and speeds, the two-cycle still reigns supreme, particularly in the smaller boats, in which class are included all those not equipped with engines of more than 20 horsepower. Over this limit the four-cycle type of engine is practically universal, and as represented at the show there were many novelties of construction to attract attention. In adopting the four-cycle type, it is particularly noticeable that designers have shown a decided leaning toward marine standards as exemplified in the steam engine, though with this exception the four-cycle motor was in the great majority of instances but an adaptation of the automobile motor to a new environment. As a matter of fact, in some instances, the engine could have been lifted out of a launch and placed directly on a car with but few minor changes, necessitated principally by the need for starting it from a distance, as where it was located under the forward deck.

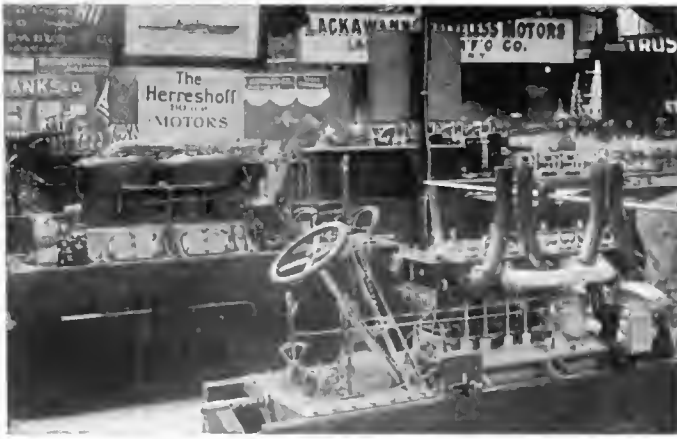
Multi-Cylinder Types a Feature.

Probably the most striking feature of the showing of motors, as a whole, is the extent to which multi-cylindered engines predominate. But a few years ago, a motor having more than two cylinders was quite an exception to the general rule, and even at that it was usually a three-cylinder type, the prevailing designs being single, two and three-cylindered, and the former two far outnumbering all others. Now the four-cylinder motor is well to the fore, as the result of the adoption of the four-cycle type, and six-cylinder motors are also quite common. In fact, it may well be said to be a six-cylinder show, from the number of this type that were to be found at the various stands.

Beginning with the huge 300-horsepower six-cylinder Standard, which gained the world's record for speed in the launch of the same name, it was noticeable that there were six-cylinder engines of varying powers at the majority of the stands. At the exhibit of the Gas Engine and Power Company a six-cylinder 100-horsepower Speedway motor was running under its own power, gas being employed as the fuel. The valves are concentrated on the right hand side, the exhaust being at the lower part of the pocket and the inlet the upper, the latter operating with an overhead rocker and push rod, and the exhaust by direct thrust from the camshaft, as on the automobile type. The inlet manifold is a perfectly straight bronze tube lying parallel with and directly at the inlet valves, the carbureter being placed at the lower end of a right-angled offset at about the level of the base. Ignition is by means of an Apple dynamo and set of accumulators, the generator and water pump both being driven from an independent shaft. Duplicate ignition employing make-and-break ignitors supplied by a Simms-Bosch low-tension magneto, and the usual jump spark with an Apple ignition set, are used on the 200-horsepower six-cylinder engine shown by this firm, which has a double jet, water-jacketed carbureter supplied by a small pump, a constant level being maintained by means of an overflow.

Some Motors That Attracted Attention.

Holding the distinction of being the lightest marine motor of its power ever built, the power plant of the high-speed motor-boat "Den," both the engine and hull of which were designed by Herreshoff, came in for an unusual amount of attention. It is of the four-cylinder, four-cycle type, patterned after auto practice, and complete with its reverse gear and all controlling mechanism only tips the scales at 1,200 pounds. Its dimensions are 7-inch bore and 7-inch stroke, and it is rated at 120 horsepower. These engines are built from Herreshoff designs by the American and British Manufacturing Company, Bridgeport, Conn. A six-cylinder four-cycle motor, rated at 50 horsepower and known as the H & H, combined quite a number of unusual features of design and construction that served to distinguish it. The valve mechanism was of the overhead type run from a single camshaft supported on bearings on the cylinder heads, and every part was designed to be readily dismantled. But its most interesting feature lay in the method of ignition, which was by means of a small high-frequency inductor alternator mounted directly on the timer shaft. This generated an alternating current at 122 volts, which was sent through a step-up transformer and raised to a potential of 32,000 volts, thus dispensing entirely with brushes, coils and tremblers. The Truscott motors, which were shown in a large variety of sizes and powers, also came in for favorable attention by reason of their simplicity and compactness,



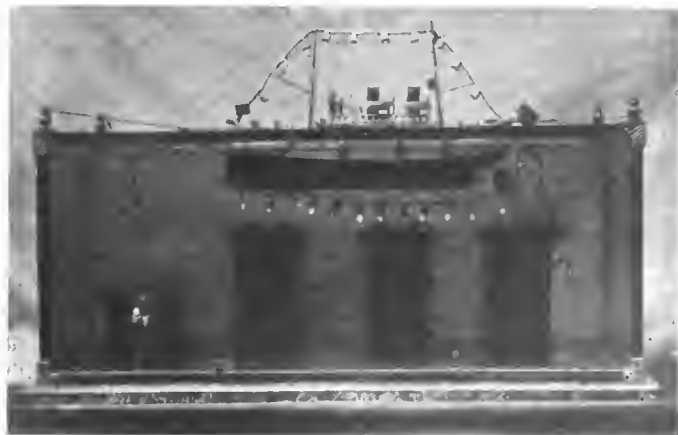
HERRESHOFF 120-H.P. MOTOR FROM THE "DEN."

as well as their apt name of "Heavy Duty." An exhibit that was a constant center of interest throughout the show was that of the Lackawanna motors, one of which was shown running a propeller in a small inclosed tank of water. The ease with which it could be reversed, whether running on the battery or a magneto, proved a surprise to the majority of spectators. This firm showed a most complete range of motors, including a very compact six-cylinder type, composed of three of their well-known units, beside which there was also on view a 12-horsepower set for stationary duty.

Compressed Air Self-Starting Device.

The self-starting Dock engine, built by the New York Safety Steam Power Company, proved to be a surprise in the shape of a five-cylinder motor of the open base marine type that combined an unusual number of meritorious features. With this number of cylinders, the cranks being at 72 degrees, the engine is never on a dead center. Starting is accomplished by means of a supply of compressed air maintained by a small air-compressor. Opening a small cock for a moment sends a stream of compressed air through the carbureter and supplies the cylinder that is in the firing position with a charge of explosive mixture under compression. Starting is facilitated by the system of ignition employed, which may aptly be termed a "constant primary circuit" type. That is, the accumulators are switched onto the single coil and left on closed circuit as long as the motor runs, the secondary current being sent to the various plugs by a special form of distributor, using no actual contacts, the current leaping to the revolving arm as it passes over the terminals. This secondary timer is constructed of hard rubber and brass and covered with a glass plate, so that its operation may be inspected at any time.

Though James Craig is a well-known builder of both six and



SUBMARINE EXHIBIT OF WITHERBEE ACCUMULATORS.

eight-cylinder types, his exhibit only included engines of three and four cylinders, these being of the open base marine type with the superimposed valve gear that has always distinguished the products of this maker. The Holmes long-stroke "get-at-able" motor is another of the open-base type with typical marine connecting rods and method of lubrication, but is closed when running by easily removable side plates. Its fine finish and mechanical excellence attracted no end of favorable comment. The Brownell-Trebert Company, Rochester, N. Y., are also very strong advocates of the six-cylinder type, and showed both fours and sixes in their exhibit. They make both the superimposed valve type and the plain. The Buffalo Gasoline Motor Company, Buffalo, New York, showed a complete line of its models in various sizes. A novelty was the Ramsey marine engine, in which the cylinder is offset on the crankshaft the length of the crank throw.

Kerosene Burning Engines in Evidence.

That considerable study is being devoted to the question of running marine engines on fuels other than gasoline was evident from the number of engines designed to run on kerosene. Chief among these was the Monarch line of engines, of which a six-cylinder type was shown. The regulation Schebler carbureter is used, the heater for vaporizing the kerosene being maintained at



"SIMPLEX X," A STRIKING EXAMPLE OF SPEEDY LINES.
Exhibited by Smith & Mabley Mfg. Co., New York City.

the proper temperature from the exhaust, the carbureter's function being merely that of spraying the fuel preparatory to vaporizing it. In this engine, electrical ignition is employed, but in another designed to use kerosene also, the incandescent system is used, an ingenious method of timing the explosion being arranged by means of an adjustable ignitor which may be raised or lowered while the engine is running.

Reverse Gears and Clutches.

Prominent among the new things to be found in this field was "Joe's Gear," made by the Snow & Petrelli Manufacturing Company, New Haven, Conn. It is of the spur type, the pinions being of hardened high-grade steel, accurately cut, and running in an oil-tight case. They are only in operation on the reverse, the device revolving solidly when going ahead. The complete gear itself is extremely simple and compact, and may be applied directly to the engine shaft, making alignment easy and positive. This concern also makes marine friction clutches, which are sold independently of the gears, as well as a line of yacht cannon and brass fittings. The well-known Gies gear, made by the Gies Gear Company, Detroit, Mich., and which has been on the market so long as to scarcely need description, as well as the Perfection gear, made by the Perfection Reversing Gear and Supply Company, New York, were also shown. The latter is of the constant mesh type, both the forward and reverse drives being made through a special expanding ring friction clutch.



A GENERAL VIEW OF BEAUTIFUL NASSAU HARBOR DURING THE RECENT MOTOR BOAT CARNIVAL.

THAT "FLAG-TO-FLAG" BOAT RACE.

According to official news which comes from Miami, Fla., the Race Committee of the "Flag-to-Flag" motor boat race, Miami to Nassau, has officially declared the *Whiz*, of New Haven, Captain Norton, winner in the power boat class, and the *Daggett*, of Miami, Captain Haggerty, winner in the auxiliary yacht class. Second in the classes respectively were the *Lee S.*, of Jacksonville, and the *Klondike*, of Miami. The auxiliary *Muriel*, of Miami, chartered by several members of the New York Motor Club, which started ahead of the other racers and then claimed the contest, was disqualified. On the return trip from Nassau to Miami the boats had a lively run across the Gulf Stream, the *Daggett's* engine breaking down on the homeward journey and the *Lee S.* being required to lend a helping hand.

In a letter received from W. J. Morgan the story is told of the exciting trip of the *Muriel*, and the tale is related in the characteristic manner of the "Senator." It is herewith given:

"We certainly had a frightful trip on the *Muriel* in the Flag-to-Flag race. This 55-foot auxiliary we chartered from some Nassau people who don't know any more about navigation than I do, so the result was that it nearly fell to the lot of the editor of THE AUTOMOBILE to write some touching obituary of 'Jonah,' the 'Flash-in-the-Pan Brothers,' and yours truly. Three others, including Commodore Allen, of Daytona, and Mr. Bell and his wife, made up the chump party who trusted their lives to the green sailors. The *Muriel* had plenty of sail and a 10-horsepower motor. The motor refused to mope before we got out of Biscayne Bay, but the sails carried us across the Gulf Stream in good shape. We only went thirty miles out of our course in a forty-five-mile run. The 'navigator' blamed it upon the compass, and said the motor probably had magnetized it. If that was so, it was the only thing the motor did. At night we anchored off a bleak-looking island without a sign of life on it or even a shrub, but which had the high-sounding name of Orange Key, probably because no oranges will ever grow on it. Our experienced sailors anchored within 400 yards of this leeward shore, a thing which Commodore Allen advised me proved that they were no sailors; but you see they were running the boat and we were having a run for our lives. I had been battling with Old Neptune most of the day and he had slightly the best of it, so that after sniffing at the supper, I turned in at about 6:30.

"At 8 o'clock Spooner woke me with a cry that our anchors were dragging and that we were nearly on the rocks. Upon which I heard the surf break with a roar, when I clambered

on deck with most of my clothes off, which Allen did also. If I live to be a thousand, I do not believe I ever will forget the terror of the moment as I looked at the breakers about 100 feet away and saw that our boat was slowly moving towards them. We got hold of the anchor chains and pulled for dear lives—Wetmore, Spooner, Lazarnick and Allen. We lay on the deck, pulling for our lives, and let me tell you there was not a coward among them. I thought of home, but did not fear what I thought was the final end. The anchor stuck, and I suggested to Allen that it be cut away. The crew by this time had become useless and panic stricken. Allen roared, 'Cut away those anchors or in five minutes we will be on the rocks!' Here again trouble came. The small anchor had fouled the larger one, so that they could not be run out by their chains through the hawser holes. Fortunately one of the anchors had a rope, which one of the sailors cut, and with a rattle the big chain and the rope went swishing to the bottom. At that moment a merciful wind caught the jib sail, and, as the spray was being felt on our faces from the breakers, the boat stood off from the rocks. We drifted all night, not knowing where, with no anchors, but the morning showed us that we had made no gain or loss. We fortunately anchored safely, after borrowing an anchor from a sponge vessel, and eventually arrived at Nassau, Thursday noon, being three days in crossing the 150 miles between the flags.

"We had quite an exciting experience the third day out from



GENERAL VIEW OF TOWN SHOWING GOVERNOR'S PALACE



TROPICAL "SALT CAY," OWNED BY ABRAM VAN WINKLE.

Miami. We came across a stranded whale sixty-five feet long, which we tried to capture. We forgot all about the race and drew our boat alongside of the monster. We used a shotgun and revolvers and also a long knife tied to an oar. We started him going to deep water and for our pains we ran on a bar. No liquor sold there. We did not do the fish much damage, but Spooner and Lazarnick got twelve pictures each.

"We claimed the first prize for the reason that we reached Nassau first, and it seems that it came about because the others did not start until Thursday and we began our foolish trip on Tuesday. On that morning we got away one hour late and thought all the rest had gone, for the reason that we could not get in close enough to the starting point to see if this was actually so. But as the rule said the start was to be at 7:05 A.M., we made up our minds that we were one hour late. So we went on our way to the first control, which we never reached. We now claim the prize for being d—n fools and vote each of ourselves a medal for doing something which the wise ones refused to do. If you ever catch me on a cockleshell boat with land-lubbers for navigators you will please pin a rose on me."

IN 1906 THERE WERE 1,267 CARS IMPORTED.

During the year 1906, according to the official reports, 1,267 foreign cars were brought into this country, 874 of which were imported by dealers and 393 brought in by individuals. The Hol-Tan Company led all other importers, selling 155 cars in this country. The next nearest total was that of Panhard, though three firms imported them. In grand totals the Mercedes led with 208 cars, Panhards second with 203, Renault third with 162, and Fiat fourth with 159. The following table tells its own story:

Car.	By Importers.	By Individuals.	Total.
Fiat	155	4	159
Panhard	125	78	203
Mercedes	98	110	208
Rochet-Schnelder	56	2	58
Darracq	54	1	55
Renault	75	87	162
C. G. V.	55	25	80
De Dietrich	36	10	46
Hotchkiss	35	11	46
Clement-Bayard	29	1	30
Berliet	29	10	39
Delaunay Belleville	27	3	30
Martini	25	5	30
Brasler	18	9	27
Italia	14	1	15
Bollee	9	27	36
English Daimler	11	1	12
Zust	9	1	10
Isotta Fraschini	7	1	8
Blanchi	2	4	6
Mors	5	2	7
	874	393	1,267

FOR NATIONAL AID IN ROAD BUILDING.

WASHINGTON, D. C., Feb. 25.—A notable good roads speech was made in the House of Representatives this week by Representative Flood, of Virginia, during the course of which he submitted a few reasons why he thought the Government should aid in the building of public roads throughout the country. The following excerpts from his address are of more than passing interest to the automobilists of the country:

"I think, undoubtedly, the power of the Government to make appropriations for the purpose of building roads is ample and can be defended. The power is expressly given to Congress by the Constitution 'to provide for the general welfare,' and the general welfare of this country demands at this time nothing so imperatively as it does a good system of public roads—a thing which we can never have without the aid of the Federal Government. The exercise of this power to aid in the building of public highways is more than 100 years old.

"There is no real distinction between a turnpike and a railroad in their claims for help from the general government. But the railroads have been aided to the extent of millions and millions of dollars in land and money by the national government, while the proposition to secure aid for the highways of the country meets with no favor beyond a respectful hearing. There is no real distinction, so far as the public good and welfare is concerned, between the aiding of public roads and the aiding of waterways, and yet our waterways and harbors have been aided to so colossal an extent as to dwarf and finally eclipse our equally valuable highways. The importance of good roads is so apparent it will not be questioned by one and need not be discussed.

"We are appropriating this year \$83,000,000 for rivers and harbors, \$95,000,000 for our naval establishment, and \$81,500,000 for the army. The building of a comprehensive system of good roads is of more importance to the people of this country than any one or all of these purposes. The necessity for better roads in many parts of this country is the greatest need of the hour. The States and counties cannot build them. The right kind of roads can only be built, and will only be built, when the national government lends a helping hand. If we are ever to have a system of roads in this country to compare with those of the other enlightened nations of the world, it has got to be done by the aid of the Federal Government.

"All the progressive countries of Europe are giving national aid to their highways, while our government is following the example of the South American nations. What a different picture has been presented by the countries of Europe. A splendid system of roads has been inaugurated by those countries. The great Napoleon, following the example set by the Roman Empire, built an extensive system of roads throughout France, and now not less than \$7,000,000 each year are expended by the French government in keeping up these roads and making new roads. The central government of England began to improve the roads in that country in 1835, and now \$15,000,000 is being expended yearly upon their roads.

"While this country has advanced in area, in population and in wealth, and along all lines of science, trade and industry, no advancement has been made in the condition of our roads in many sections of the country during the past one hundred years. Let the general government foster this great enterprise, not only at the behest of justice but of wisdom."

ROAD BUILDERS' CONVENTION, MARCH 12-14.

James H. MacDonald, president of the American Road Makers' Association, says that the road builders' convention, which is to be held in Pittsburg on March 12, 13 and 14, promises to be the largest meeting of the kind ever held in this country. He says the purpose of the convention will be to unite in one big meeting all the scientific road building interests of the United States, "each commissioner to relate to the convention work that has been done and to be done in his State."

A CRUCIAL TEST OF MODERN ALLOY STEEL

By THOS. J. FAY, E.E.

Of the several grades of steel likely to be found in automobile work, but few of them will be found to possess the characteristics most to be desired, *i.e.*, the ability to withstand shock without rupturing. It is scarcely to be expected that any automobile should be collision-proof, and deformation, as a result of a collision, is a reasonable expectation; but there is a great difference as between deformation and actual rupture of parts such as may sustain direct impact. In a testing machine

shock, or alternate stresses, are cars with a high price tag, and it is extremely difficult, in the abstract, to tell just why one car should cost double the price of another car, if both have the same power, same weight and same capacity for passengers or burden, as the case may be.

There may be some chance for misunderstanding in relation to this matter in that some may think the ability of steel to sustain shock loads is limited to "alloy" steel, as nickel, chrome-nickel, or chrome-wolfram steel. Such a view would be fallacious in the abstract, at any rate, since all grades, or better yet, kinds, of steel are more or less possessed of this ability, depending upon (a) purity, (b) process of manufacture, (c) extent to which the product is worked, (d) skill in treatment, not to mention numerous details of more or less moment, attending the process. The great question at the present time is to bring about a more complete realization of the fact that shock ability is a much desired quality, conspicuous for its absence in much of the steel to be had at every hand.

The old wagonmaker, in his day, had the right idea, although no ready means is at hand to indicate the process by which the wagonmaker hit upon the right idea. For all anyone can tell, the process was by way of repeated failures. In any case, wagonmakers use iron and steel of a quality that *does show great ability to sustain shock loads*. and, in the case of the wagonmaker, "alloy steel" is as a foreign language to a Kentucky colonel, but the carbon is kept very low in the wagonmaker's product and the elongation is high. Of course, such steel has not a high tensile value, nor would it serve for certain parts of motor cars; hence the need of alloy steel for them; but, whether the steel is alloyed or not, it should be rated, as before stated, on a basis of its ability to sustain shock loads, without showing rupture, *even though it may deform*.



FIG. 1.—How the 60-H.P. Mercedes looked after the smash.

"proofs" are pulled until rupture takes place, and the conventional physical properties are noted; or under a "tup" proofs are subjected to repeated blows until rupture takes place, unless perchance the proof is so tenacious as to bend so much that the test must be interrupted on that account. In the "pull test" the ability of steel to withstand shock is scarcely disclosed at all, while, on the other hand, the "tup" test is a fair indication of the shock ability of steel; but it is rarely that shock tests are published, if indeed they are made, except at rare intervals.

Why Shock Tests Are Not Made.

The probable reason why shock tests are neglected is owing to the fact that steel, high in tensile value, for any given *genera* is not likely to show up well in the "tup" test, and strange at it may seem, "beautiful women use the mirror most," so to speak. On the other hand, buyers of steel cry for high tensile values, and overlook the question of shock ability, whereas steel mongers "do the diplomatic" and furnish what is demanded, or what is most in demand, at any rate. The cars that are constructed of materials, such as are known to be capable of sustaining

The Unusual Lesson of a Wreck.

Illustrative of what can be done by way of building cars that will sustain shocks without rupturing the members (although, as before stated, they may bend), Fig. 1 is offered as a fine example—an illustration so pertinent, in fact, as probably not to be duplicated. An inspection of this illustration will show in the foreground the twisted and distorted aggregation of what previously served as a 60-horsepower car—suitable for racing when stripped—of the regular Mercedes products. The photographs were taken directly after the accident that befell the



FIG. 2.—On the Vanderbilt Cup Course, where the Mercedes climbed the telegraph pole, continuing until it turned turtle.

car during a "trial spin" on the Vanderbilt course just before the last event. The car was going at a mile-a-minute gait in the hands of the B-L-M driver, and in turning to make a curve at full speed, the steering gear locked; ere the car could be righted, the telegraph pole, broken in half, as shown in Fig. 2, was struck, with the result that the car was piled up in a twisted and distorted mass, full one telegraph pole distance or spacing away, just as the photograph shows, excepting that some of the parts previously detached were thrown on the pile at the pole, distant from the broken pole hit by the car. Fortunately, neither of the occupants of the car was seriously injured, although they were precipitated headlong, and one of them made a flight—air line—of some 69 yards.

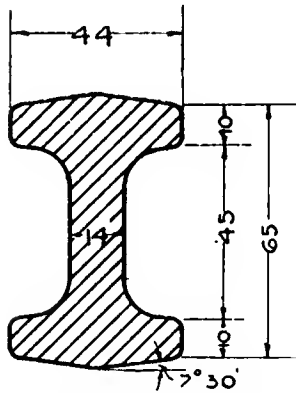


FIG. 3.—Section of Mercedes rear axle made of chrome nickel steel.

This, however, is beside the story, for the point to be made is that of all the parts in the car, nearly every one of which was deformed, *not one showed a sign of fracture*, excepting some slight damage to the motor—a fracture of the aluminum crankcase, which is to be expected in view of the properties of aluminum. The car was some three years old and ran in the first Vanderbilt race, thus adequately illustrating the fact that ample opportunity was afforded to induce "metal fatigue" long before the moment of the accident; that is, assuming "metal fatigue" would develop to any marked extent in steel so fine. The car was a 60-horsepower "Mercedes" in racing trim, and while the speed was not definitely known, it was believed that it was something like a mile in 58 seconds.

As regards the grades of material that make it possible to report such results, it will be understood a metallurgist could write a book and still have something to talk about. Lack of space forbids lengthy discussion. It will be sufficient to conclude with a statement of the shock ability of some of the steel used in this class of cars, which may be set down as follows:

Chassis frame of C460 Krupp steel, the ability of which may be given as follows:

Physical Properties Krupp.

T.S.	E.L.	Ex-2"	Cold bending test.
100,000 lbs.	72,000 lbs.	16 per cent.	180° and flatten down.

Minimum guarantee for plates.

Diameter of proof 0.5 inch.

Deflection by Shock Krupp.

Blow Deflection No.	inches.	Data.
1	0.79	Proof: 1.18"x1.18"x11.81"
2	1.42	Supports: 9.45" separated.
3	2.05	Weight of tup: 448 pounds.
4	2.52	Height of fall: 39.37 inches.
5	2.91	Specimen doubled after test without rupture.

This product was fully illustrated in THE AUTOMOBILE of February 7, 1907, page 277. The question of the best dimensions of side frames was not raised, and it might be well to refer to this matter at this time. Many side frame members are made 4 1-2" x 1 3-4" x 3-16" depth, width and thickness of plates, respectively. The writer is at present using dimensions as shown in Fig. 4, although it may be well to repeat that the writer uses E F 60-o Krupp chrome nickel steel, so that for C460 Krupp the thickness should be 5 m/m instead of 4 m/m for equal rigidity, and it is safe to say the difference in weight would increase one-fifth as a result.

No Ruptures Whatever Were Found.

Axles in the car of the subject were of E F 60-o Krupp chrome nickel steel, the section of the rear axle being as shown in Fig. 3. Of this material the writer has commented at length

in his writings, but the opportunity to comment upon the question of ability to withstand shock has been limited, because tests of a thorough order were not easily obtainable. The axles in the wrecked car, however, surely were given much abuse, and they did deform, but they did not rupture. In fact, it would be possible to straighten out and use them again, not forgetting to subject them to an annealing process, of course. The shock ability of this particular steel is given by Krupp as follows:

Deflection by Shock Krupp.

Blow Deflection No.	in inches.	Data.
1	0.71	Proof: 1.18"x1.18"x11.81"
2	1.30	Supports: 9.45" separated.
3	1.89	Weight of tup: 448 pounds.
4	2.40	Height of fall: 39.37 inches.
5	2.80	Specimen doubled after test without rupture.

This product performs in a manner superior to C46-o Krupp steel, as a comparison of the shock tests will show, and knowing how well the axles served in practice, it is easy to fix upon a standard to go by, since the shock ability of this product is given in very precise terms. The distance rods, jackshaft, driving shaft, crankshaft, gears, and like parts, having the greatest loads to sustain are of this same steel, as indeed they should be, since some of these parts do far more work than the axles. As to why this steel so ably sustains shock loads, a word may be in order, particularly in view of the fact that it is not merely because the steel is an "alloy" product.

With a view to discussing the matter in a clear manner, the chemical composition will have to be restated, viz.: E F 60-o Krupp.

Chemical Composition Hunt.

Chromium	1.40	per cent
Nickel	3.31	" "
Carbon	0.31	" "
Silicon	0.20	" "
Sulfur	0.028	" "
Phosphorus	0.013	" "
Manganese	0.41	" "

As will be plainly seen, the phosphorus component is very low, and the sulfur is comparatively low as well, whereas the manganese is held at a moderate value. On the other hand, the high strength is not due to high carbon, nor can manganese be said to influence the strength in this instance, and so it is rational to conclude that pure metal, very low in the carbides, is rendered serviceable by the excellence of the relation between chromium, nickel and carbon, all of which is amply borne out, not only by the facts, but by the deductions that follow the tests in the conventional way, one of which tests by Hunt, at the instance of the writer, was as follows:

Physical Properties E. F. 60-o Krupp.

T.S.	E.L.	Ex-8"	Con.
109,100	81,400	23	61.8

This test is somewhat at variance with Krupp's figures, but the elongation checks up very well indeed.

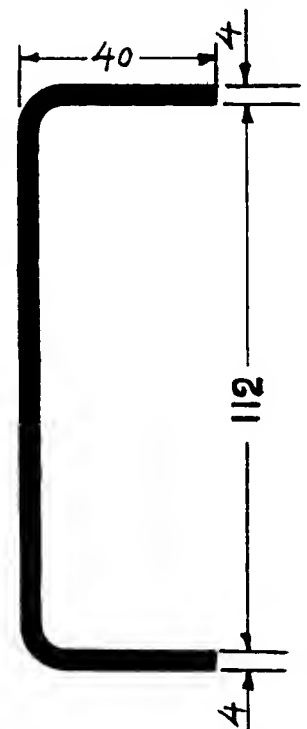


FIG. 4.—Section of side frame of chrome nickel steel.

Just how dirt and other foreign matter finds its way into the inner recesses of the carburetor is something that even those most familiar with such matters find difficult to explain, except by the statement that such things do get there and that is all there is to it. This being the case, the necessity for constant vigilance regarding the fuel itself, as well as occasional inspection, is apparent.

SOURCES OF ELECTRIC IGNITION CURRENT

By CHARLES B. HAYWARD.

If it were possible to calculate the percentage of breakdowns in ignition systems that are directly traceable to each essential part, so that it could be said with any degree of certainty that the plugs failed so many times out of a hundred, the wiring so many and so on in the case of each part, such as the timer, switch and others, until the source of current was reached, it

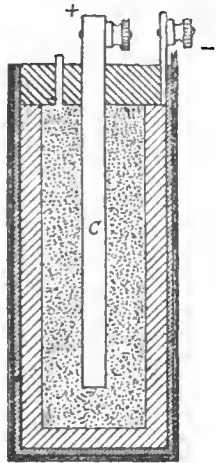


FIG. 1.—Section of dry cell.

would be found that the latter generally proves to be a most prolific creator of failures. This was the case to a very great extent in the heyday of the dry cell, the percentage of failures from this cause having been very materially reduced by the adoption of accumulators and the improvement in mechanical generators. Considered from the point of view of the electrical engineer, the problem presented by the necessities of the ignition system of an automobile is positively childish in its simplicity. Taken fundamentally, it means nothing more difficult than the maintenance of a current of one or two amperes at a pressure of six to eight volts; the remainder is merely a question of providing simple and easily cared for apparatus, requiring no particular skill for its proper maintenance. As a matter of fact, modern coils and timers run on considerably less than this—or about 1-2 to 3-4 of an ampere at 6 volts, or slightly less in the case of accumulators after they have been in use some time.

The Old Story of Theory and Practice.

But like so many other things, this has proved to be but another instance where theory and practice have been found to disagree so radically that for a long time it seemed to be impossible to ever reconcile them. For the purposes of this article, sources of electric current may be divided into two classes, chemical and mechanical, the former including batteries of every kind, and the latter generators, such as small dynamos or the magneto. Merely to complete the list, the thermopile may be mentioned, this being a device by means of which electricity is produced directly from heat, but as it has never been brought beyond the laboratory stage, it need not be considered further, although an attempt has been made to use it for ignition purposes, employing the exhaust as the source of heat. For reasons that will at once be evident, the dry cell was selected in the first instance as the best available form of current producer. It combined cleanliness and portability with cheapness and ease of replacement, and a set of five or six cells seemed to provide all that could be desired. They produced a current at 10 to 15 amperes at 6 to 7 volts, so that, theoretically at least, they fulfilled the requirements. But pioneer automobile builders had much to learn of the peculiarities of the dry cell, and it is easy to see that progress might have been much more rapid in those first years had not many of the vagaries of the battery been attributed to the engine.

Characteristics of the Dry Cell.

As is commonly known, the dry cell is such only in name, the active solution being held by some absorbent material such as sawdust, paste or the like. Before going further, it may be explained that every battery consists of three essential elements, a negative and a positive plate or element and the exciting solution. The so-called dry cell consists of a carbon negative element in the shape of a plate and a zinc positive element, usually made in the shape of a containing case. The exciting solution is made of sal-ammoniac and water, in the proportion of about a pound of the former to half a gallon of water, the solution recrystallizing

if made too strong. Sawdust or special mixtures of paste are usually used to absorb it, and this is then packed between the two elements, the carbon plate being surrounded by a quantity of manganese dioxide or other depolarizing substance. In the generation of electricity by chemical means, hydrogen gas is always evolved. It is created at the positive element—the zinc in this case, and passes directly to the negative element. These terms are apt to be found somewhat confusing, as the positive element—the zinc—provides the negative terminal of the cell, and the carbon the positive terminal, though it is the negative element. The activity of the cell depends upon the rapidity with which hydrogen is evolved, but its continued working depends entirely upon how fast the gas is gotten rid of. As it comes from the positive element it passes across and the bubbles attach themselves to the negative element, insulating it from the action of the exciting fluid. When the surface of the negative element becomes entirely covered with bubbles of hydrogen, the cell is said to be polarized and its activity is seriously impaired; it seems to be dead. To overcome this to as great an extent as possible, substances having a high affinity for hydrogen are employed, which accounts for the use of manganese dioxide or similar material in the dry cell. This absorbs a large proportion of the hydrogen and greatly prolongs the active period of which the cell is capable. The dry cell is technically known as open-circuit; that is, it does not develop any energy except when called upon to do so by closing the circuit. As soon as the circuit is broken the production of hydrogen ceases and what has already been generated passes out through vent holes left in the pitch sealing at the top of the cell. It is then ready for active work again; this is generally termed recuperation, and it is the peculiarity of the dry cell that caused pioneer builders of cars untold trouble.

Early Experimenters Were Greatly Puzzled.

By reason of the fact that its excitant is not in a liquid form and consequently cannot circulate freely between the elements, the dry cell does not show the same degree of efficiency as a liquid cell of the same kind. Furthermore, it deteriorates steadily with age owing to the evaporation of the solution from the absorbent material, which cannot be totally prevented owing to the necessity for providing vents for the escape of the hydrogen. Given a perfectly fresh cell that will show 1 1-2 volts and 15 to 20 amperes on test, and place it on a short circuit for ten minutes, at the end of that time it will have scarcely enough life left to move the needle of the instrument. Tested two minutes later, it will show a surprising renewal of activity, and at the end of five or six minutes' rest will give practically the same indication as if it had not been allowed to run down. This may be repeated quite a number of times, the cell showing the same surprisingly rapid recuperation in each instance, until it begins to be exhausted by reason of the consumption of the active element of the exciting solution or by drying out. This was at the bottom of the early experimenter's troubles that were, in very many instances, laid to something else. The dry cell of that day was

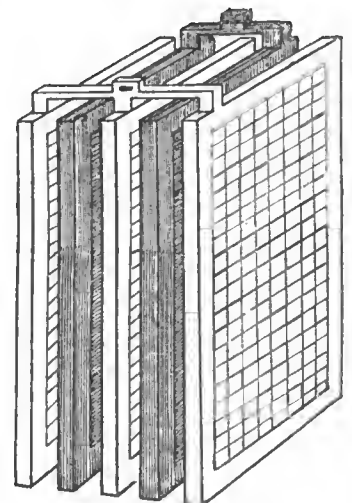


FIG. 2.—Accumulator plates.

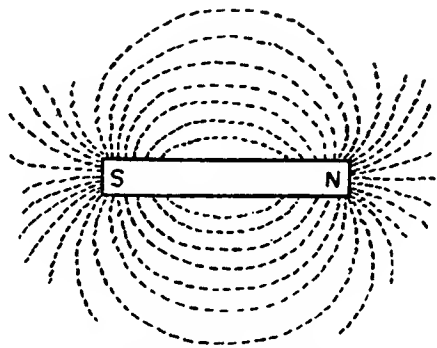


FIG. 3.—Magnetic field round a straight bar magnet

a long way from the high state of efficiency to which it has been brought in the meantime, and after the engine had been run a short time the cells no longer produced sufficient current to spark it. As they were all right not long before they were seldom suspected, and other parts of the mechanism were examined for trouble. Nothing appearing, that solace in times of perplexity—the crank—would be twisted and the battery having recovered in the meantime, the motor would start without further trouble.

Performances of this kind were repeated for a long while before the true cause of the trouble became established beyond a doubt, and then other means were resorted to, in many cases with even less success, but of these more later. In the end it was found that the dry cell, while suitable for use with single and two-cylinder engines, particularly of the slow speed horizontal types to which so much attention was devoted in this country in the early days of the industry, it was not capable of withstanding the draft made upon it by the high-speed four-cylinder engine and, though the dry cell has been vastly improved in the past few years, its use is not extended on multi-cylinder, high-speed engines, except possibly as an emergency. The dry cell is still used very largely on one and two-cylinder cars and on small motor boats. Much of the difficulty experienced with it in early days was due to the crude nature of the timing devices employed, which, in many instances, were designed to give a contact of much longer duration than was necessary to accomplish the end desired. This and other drawbacks of the apparatus that the first builders found themselves compelled to use, such as coils of very low efficiency, all combined to waste the life of the dry cell and the latter was blamed. When the high-speed, four-cylinder engine came into vogue it soon became apparent that, even at normal speed, the number of contacts per minute was so great as to constitute an almost continuous draft on the battery, a service for which the dry cell is not fitted.

Other Chemical Sources of Current.

There are numerous other methods of producing an electric current by chemical means, all of which are generally classed as primary batteries, as the current is generated directly from the action of chemicals on metals, but they are all open to the same objections as the dry cell, beside which they have other disadvantages, such as high first cost, noxious character of the solutions employed, and the like. Suffice it to say, no attempt has ever been made to utilize them for automobile work. This narrows the

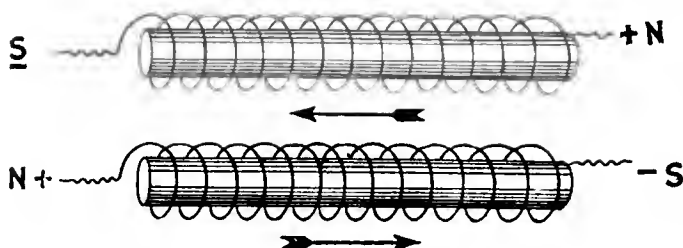


FIG. 4.—Illustrating principle of the electro-magnet.

field of chemical current producers down to the dry cell and the accumulator. The latter is the result of many years of experimenting and investigation and forms a subject that cannot be treated at sufficient length under this heading, so that merely an outline of its characteristics will be given here, and a chapter devoted to it later. All storage batteries are classed as secondary cells because an electric current must first be passed through them. They do not generate electricity as does a primary cell. In the popular sense, they store electricity which may again be drawn forth when required, but, as a matter of fact, the process is wholly one of chemical conversion and reconversion, the current passed through them in the first instance constituting the excitant. Early types of storage batteries were, in fact, made in this way. The lead plates which constitute the elements were scored or nicked and placed directly in the acid solution; they were then "formed" by passing and re-passing a current through them in different directions until a sufficiently heavy deposit of the required chemicals made their appearance on the plates. Modern accumulators are made with cast lead grids, much ingenuity being displayed in the design of the latter by various manufacturers.

As is the case with a primary cell, an accumulator consists of a positive and negative element and an exciting solution, usually termed the electrolyte. Any cell which is capable of regeneration after exhaustion by passing an electric current through it is an accumulator, but as the lead plate type is the only one in general commercial use it alone will be considered. The positive elements consist of peroxide of lead and the negative of metallic

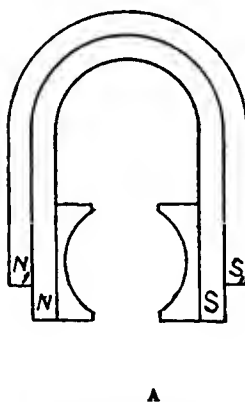


FIG. 5.—Magnetic field of a magneto.

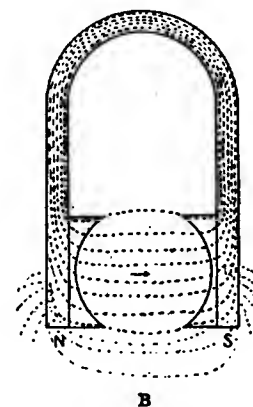


FIG. 6.—Magnetic circuit and lines of force.

lead in a spongy form so as to be pervious to the electrolyte, which is a dilute solution of sulphuric acid and water. The plates can be readily distinguished by their colors, the positive plate being a chocolate shade while the negative is a light gray. It is also easy to distinguish them by their number, as there is always one more negative than positive plates. Under modern methods these plates are made in the form of grids containing recesses or pockets into which the chemicals are pasted or pressed forcibly, so that they will not shake loose nor disintegrate owing to the action of the cell. Briefly expressed, the theory of the accumulator is about as follows: when the battery is discharging the current passing through it decomposes the water of the electrolyte, forming hydrogen and oxygen, the former at the positive plate and the latter at the negative. These gases again recombine to form water to a small extent, the oxidization for the most part, however, resulting in the formation of lead sulphate. As this substance is practically an insulator, it is evident that discharging a cell until its elements were converted into lead sulphate would render it absolutely worthless. There is, in consequence, a limit beyond which a cell should not be discharged. Up to this point the formation of lead sulphate is small enough to be negligible, the resistance of the cell not being unduly raised, thus permitting the passage of the recharging current and the reconversion of the elements and electrolyte to their original form, there naturally always being a

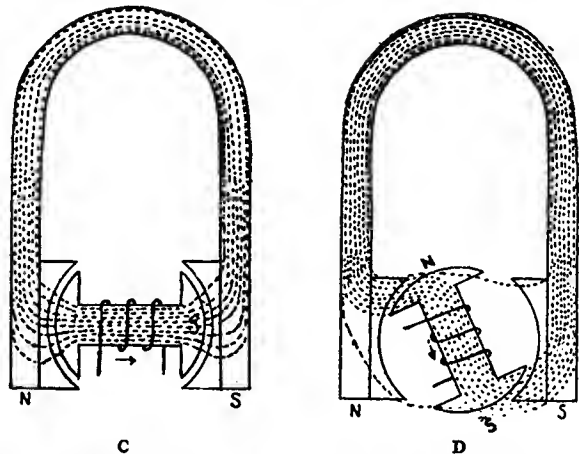


FIG. 7.—Magnetic circuit after inserting armature.

FIG. 8.—Position of maximum induction.

slight loss every time this takes place. Both the theory and practice of the accumulator with regard to ignition needs will be taken up at greater length in a subsequent article, an attempt being made to clear up those points upon which questions are most frequently asked by the uninitiated.

Mechanical Forms of Generators.

It seems strange at first sight that the average layman should accept the generation of electricity by chemical means as a fact not to be wondered at, and still regard its production by purely mechanical means as a mystery beyond his comprehension. The principles underlying the subject are few and readily understood when taken in connection with the facts concerning the characteristics of electric currents, already explained at some length. Magnetism and electricity are manifestations of an unknown force that are very closely related; whether they are in fact one and the same has not been established to a certainty. For our purpose, it will suffice to say that they are interchangeable quantities, though magnetism is producible by means other than an electric current directly applied. Probably the most familiar form of the magnet is the horseshoe-shaped toy of schoolboy days that would pick up some pins and not others, simply because they were brass, and that had such an odd effect on the needle of a pocket compass. This was because the needle was itself a magnet, and its action was merely an illustration of the fundamental principle that opposite poles attract and like poles repel one another, every magnet consisting of a north and south pole. When the north pole of the magnet was brought close to the northwardly pointing end of the needle, the latter swung quickly away on its pivot, but when the north pole of the magnet was placed close to the south pole of the needle they attracted one another and remained stationary at the point at which the magnet was held.

The action of this invisible and mysterious power is most readily explained by a very simple experiment. Spread some fine iron filings on a thin sheet of glass or paper and then bring an ordinary magnet up against the underside of it; the particles of iron will immediately arrange themselves in symmetric lines radiating from each of the poles of the magnet, illustrating graphically the direction in which the force is exerted. These lines have been technically designated as lines of force. Many schoolboys wondered what the small piece of metal, usually termed the "keeper," that came with the magnet was for, and promptly proceeded to lose it or throw it away. In time that magnet became so weak that it traveled the same road. While these lines of force radiate in the manner shown, they also travel in a circuit the same as a current, and if there be a gap between the poles much of the magnetism will be dissipated. It is commonly said to "leak away." Just what becomes of it is a mystery, but it is well known that unless the gap between the poles be occupied by some magnetic material such as iron or steel the magnet becomes weaker with age. This piece is technically termed an armature.

The first fundamental principle that illustrates the interchangeability, to so speak, of electricity and magnetism is the fact that if an electric current be passed through a wire wound about a piece of iron or steel the latter immediately becomes magnetic. In the former case this disappears as soon as the current stops, but in the latter a large part of the magnetism is retained, this being a property of steel that makes possible the manufacture of what are known as permanent magnets such as the toys referred to. On the other hand, if a magnet be brought close to a coil of wire or passed by or through it, an electric current is induced in the wire. This, in brief, represents the fundamental principles upon which the generation of electricity by mechanical means rests.

How These Principles Are Employed.

The manner in which these principles are taken advantage of practically is most easily explained by a reference to the magneto, as it is the simplest form of generator. Its two principal parts are known as the field and the armature, the former being illustrated by the sketch A. A compound magnet is used, one being placed over the other in order to increase the strength. The semi-circular blocks placed at the poles are termed pole pieces and are made in this form in order to closely embrace the armature which revolves between them. The direction of the so-called lines of force in such a combination are illustrated by B, and the manner in which the insertion of the armature affects them is shown at C. This armature in the great majority of magnetos is an H-shaped piece of soft cast iron, the recesses of which are filled with a winding of insulated copper wire. As shown at C, the armature is in what is termed the neutral position; the magnetic flux, or flow, is greatest but it is unimpeded and practically no current is generated; in other words, this is a dead point. The direction of the magnetic flux is indicated by the arrow, which also shows the direction in which the armature is revolved, that is, to the right, or clockwise. As shown at D, the armature has been given a quarter turn; although the magnetic flux is indicated as accommodating itself to the changed position of the armature, the latter is in reality cutting the lines of force, and at this point the current flow is at the maximum, starting when the edge of the armature first rises above the pole pieces, increasing until it is in the position shown at D and subsiding in the same ratio as it continues to turn, until it is again at a neutral or dead point, as shown at E. The same process is then repeated as the armature is revolved through the second half of its revolution. At F it is again shown cutting the greatest possible number of the magnetic lines of force and the current induced is again at a maximum, but the polarity of the magnet represented by the armature having reversed its relation to the polarity of the permanent magnet, the direction of the induced current is also reversed, so that the output of the machine is what is known as an alternating current. The passage of the armature past the maximum point shown at D induces a pulsation of current in one direction and,

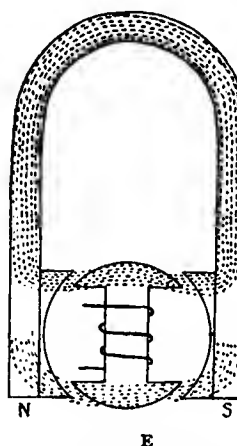


FIG. 9.—Electric "dead center" of the magneto.

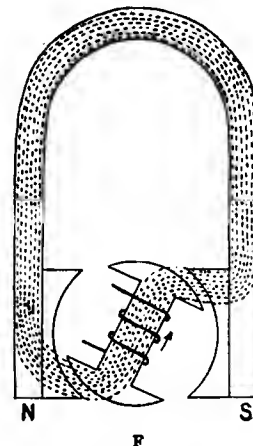


FIG. 10.—Second position of maximum induction.

as shown at F, in the opposite direction. To illustrate the principle that like magnetic poles repel and opposite poles attract, it may be assumed that a current is sent through the magneto and it is run as a motor. If the current were switched on with the armature shown in the position at C, it would not start revolving, as it is at what may be termed a magnetic dead center. But if given a quarter turn, as shown at D, it would immediately begin to turn. The north pole of the armature would repel that of the field and in moving away from it would come within the influence of the south pole of the field and be attracted, the same process going on at the other poles. If the current were sent through it in the other direction the polarity of the armature would be reversed, the upper end of it, as shown at D, then becoming south and attracting the north pole of the field so that the armature would begin to revolve toward the left. This also illustrates the interchangeability of most forms of current producers, in that when revolved mechanically they generate an electric current, and when the latter is sent through them they convert it into mechanical energy.

The dynamo or direct current generator is somewhat more complicated in that both its field and armature are electro-magnets. Both are wound with coils of wire and the current induced in each depends entirely upon the number of turns and the speed at which the armature is revolved, the latter of which reasons accounts for the fact that it is usually more difficult to start a motor when a dynamo is used for generating the ignition current than where a magneto is used. In the dynamo, also, the current generated is alternating, but it is converted into a direct current by the commutator. Both of these forms of current generating apparatus will be dealt with at length separately. The next part of this article will deal with the accumulator more in detail.

WHY THE ENGINEERS MEET IN INDIANA.

INDIANAPOLIS, IND., Feb. 25.—The semi-annual meeting of the American Society of Mechanical Engineers will be held in this city. The date of the meeting will be from May 28 to 30. One reason for choosing Indianapolis as the meeting place was that it has seven large automobile factories, with 18 additional factories in cities and towns adjoining. The number that will attend is variously estimated at from 500 to 800 persons, although the membership numbers almost 2,500 persons. On Thursday evening the banquet and reception will be given, and on Friday the visitors will be the guests of Purdue University, at Lafayette, where there are elaborate mechanical laboratories and an automobile testing plant.

All sessions will be held in the Claypool Hotel. E. R. Whittemore is chairman of the local committee on arrangements, and on the subcommittees the following chairmen have been named: Entertainment of visiting women, W. E. Sharpe; hotels, W. G. Wall, of the National Motor Vehicle Company; finance, L. M. Wainwright, of the Diamond Chain Manufacturing Company; entertainment, H. H. Rtee, of the Pope Motor Car Company, and printing and press, Theodore Weinsbank.

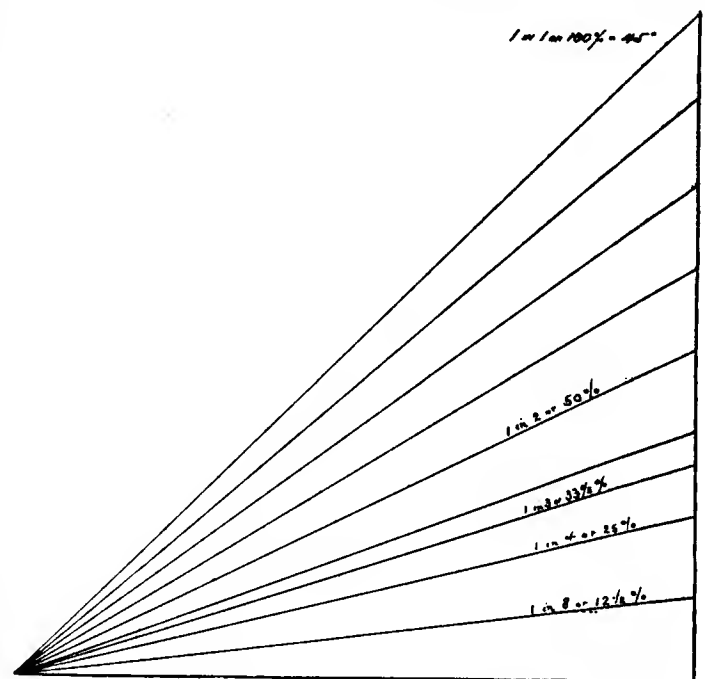
MANY AUTO STAGE LINES IN SOUTHWEST.

AMARILLO, TEX., Feb. 25.—Plans are now being made, which it is very evident will be fulfilled, for an auto line between Amarillo, Tex., and Tuseumcari, N. M. A. R. Carter, of Tuseumcari, has been in the city several times lately and has just gone over the route proposed for the line in an Orient buckboard, making a survey for the route of the line. The auto trip will be made over the route of the unfinished Choctaw extension west. There are few difficulties in the shape of bad and rough ground on the line proposed, and the promoters claim that the demand, both on account of passenger service and mail, will amply pay for the line. So far as can be learned, no machines have been purchased yet, nor is it known just what particular make is favored, but it is understood that a well-known American car will be employed.

AN EXPLANATION OF GRADE PERCENTAGES.

It is evident from the number of questions that continually crop up on the subject of grade percentages that little has been done toward removing the popular impression that a grade of 100 per cent. represents infinity, or a perpendicular line, despite the frequency with which the matter has been explained. There are two ways of stating the rise of a gradient, either in relative travel, which is more commonly used abroad than in this country, and in terms of percentage. The basic principle underlying either is the same, but it will doubtless be conceded that the English method conveys a better idea to the lay mind than does a percentage, particularly as the point upon which the greatest amount of ignorance exists is that upon which the percentage is calculated. The method of calculating grades generally used by civil engineers is graphically explained by the accompanying sketch. This represents a right-angled isosceles triangle, the base of which represents distance traveled horizontally and the upright side, distance traveled perpendicularly, while the sloping lines illustrate various grades.

If it be assumed that the base of the triangle represents a line 1,000 feet long and that the first sloping line represents a road



ILLUSTRATING METHOD OF CALCULATING GRADE PERCENTAGES.

having a rise that brings it 125 feet above the starting point, this is figured as 125 feet in a thousand, or 12 1/2 per cent. In other words, one foot of rise for every eight feet, but the latter distance does not mean distance actually traveled by a car in ascending such a slope, but distance measured horizontally with reference to that slope. The grade is measured by the tangent of the angle of inclination and not by its sine, so that a grade which represents 100 per cent. corresponds to an angle of inclination of but 45 degrees, and not 90 degrees, or perpendicular, as is commonly supposed. At the upper end of the next sloping line the elevation would amount to 250 feet, which is equivalent to a rise of one foot for every four feet traveled horizontally. So one in three corresponds to a 33 1/3 per cent. grade, one in two, to a 50 per cent. grade, and so on until a 100 per cent. grade is reached, which, as noted, is the equivalent of a 45 degree angle.

Closely connected with this is the question of how steep a grade can be overcome by a car, but as must be apparent it is one involving more than one factor, though in the end the chief consideration is that of the force of gravity. The first question is that of traction, and given this essential by providing a good road surface, very steep hills can be climbed, but sooner or later a point is reached where gravity rises superior to all other forces.

KEEPING THE MUD UNDER CONTROL

MUD, like poverty, is always with us. Its total abolition does not yet appear to be within the range of possibility; much, however, can be done to diminish this unwelcome companion, and whatever efforts are made will always be welcomed by the automobilist. One of the leading French body builders has given the results of his experiments in this direction in the columns of *La Vie Automobile*. The splashing of an automobile may be due to either its own wheels or those of other vehicles passing it on the road. Generally the automobilist is content to protect his own vehicle and is little concerned if his devices have as result the throwing of a stream of mud on foot passengers or other automobiles. There is no reason, however, why he should not only protect himself and at the same time prevent his mud striking his neighbors.

Mud splashes from the rear wheels are easily dealt with. Round mud guards, concentric with the wheel, or slightly eccentric, in order to increase the side entrance, practically resolve the question so far as the car is concerned. They do not, however, protect passers-by, and it is a pity that more attention is not paid to

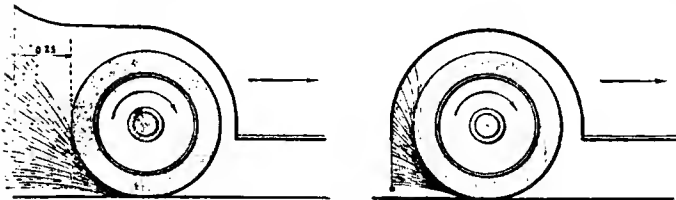


FIG. 1.—How road users are splashed. A leather shield is the remedy.

this, for by carrying the mud guards further round and fixing a leather splasher loaded on its lower end, all inconvenience to other users of the road would be abolished. When the wheels are very far to the rear, or the body is short, it often happens that the guard is not inclosed by the body, and in this case it is neces-

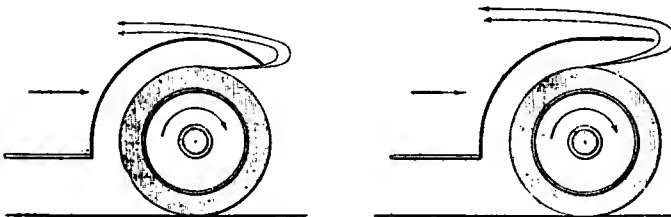


FIG. 2.—An effective front guard. An ineffective front guard.

sary to inclose the interior of the guard by a shield. Round mud guards have the serious inconvenience of being in the way when attention has to be given to the tires. For this reason many automobilists prefer mud guards with a raised rear. To be effective this type of mud guard should extend beyond the rearmost portion of the wheel at least nine inches. Even then it will not prevent splashing of other users of the road.

The problem of the front wheel is more complex, owing to the mobility of the wheels which distribute their crown of mud in every direction within their angle of turn. The particles of mud carried up by these wheels are drawn from their surface by centrifugal force and thrown according to the tangent of the wheel at the point where they leave it. They are driven rearwards by the wind and finally sucked in different directions by the air currents formed by the car.

The passage of the mud can be considered under four distinct heads, according to whether it goes under the front guard, is stopped by the guard below the chassis, above the chassis, or passes in front of the mud guard. Considering the right front wheel only, for the principle is the same in the case of all the others, when mud passes under the front guard it is largely

thrown under the footboard if the car is running in a straight line. If the vehicle turns to the right it goes under the chassis; if it turns to the left it is thrown outwards. To stop this shower of mud all that is necessary in the majority of cases is a leather

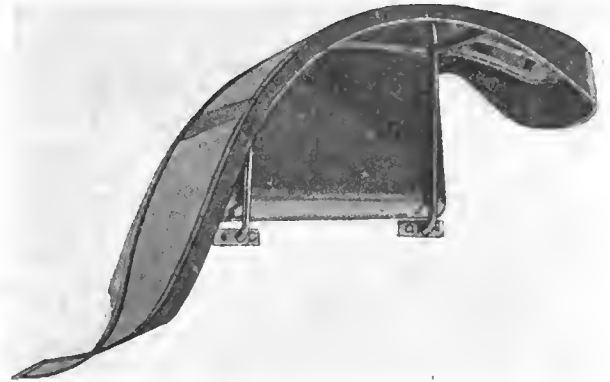


FIG. 3.—This type of guard prevents all splashing.

splasher stiffened at its base. It is this column of mud which causes the most trouble, for it is increased by the splashing caused by the falling of the wheel into occasional pools of water. This splasher thus cuts the column at its base. If the car turns to the right the direction of the column should be under the chassis, but it is thrown back by the strong current of air constantly passing under the machine from front to rear, caused by the displacement of the radiator, the front mud guards and the lower portion of the wheels. This current escapes not only at the rear, but at the two sides between the wheels. Driven from under the chassis, the mud spreads out on the outer side of the guards, splashes on the sides of the car and finally falls on the footboard. To stop these projections the space between the footboard and the chassis should be entirely inclosed by a shield which should be clean-cut, make no noise and be easily dismountable. It may be either in metal or in leather, though the latter is not to be recommended on account of its tendency to crack after a certain length of time as a result of its proximity to the hot exhaust and its continual soaking in water. Metal, on the other hand, gives perfect satisfaction; as will be seen by the accompanying illus-

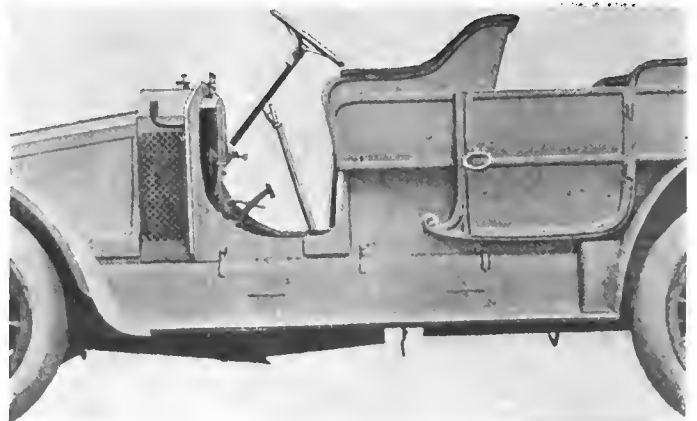


FIG. 4.—A shield between frame and footboard is clean and neat.

tration, it has the further advantage of hiding such inelegant organs as lubricating pipes, exhaust box and pipe, lower part of crankcase, etc.

If the automobile turns to the left, a column of mud is thrown outwards, but is again thrown back on the car by exterior air

currents. The mud splashing outside the action of the guards is thrown back on the body and spreads itself out on the rear mud guard, the panels and the footboard. To prevent this a 1 1/2-inch descending flange should be fixed along the entire outside edge of the front mud guard. All that has been said of the first column applies to the second, mud stopped by the guard below the chassis; for the third column—that in which the mud strikes the guard on its upper surface—it is advisable to inclose the interior of the guard by a metal shield which will completely protect the hood and the dashboard. Other projections will be stopped by the guard and its exterior border.

A final column has to be discussed, that which strikes the lamps and afterwards falls on the car. To get the best protection against this the guard should be entirely concentric to the wheel and be carried forward as far as possible. To obtain perfect protection against front and side splashes, carry the side flange forward, increasing its depth to the maximum with due allowance for the play of the wheel. When the front guards are carried far forward it may be necessary to specially shape them to accommodate the lamps. To lengthen the life of mud guards they should be mounted on the chassis, where they get the advantage of the springs, and never directly on the wheels. If fitted up in this way an automobile can face the muddiest roads, travel at a rapid rate and return to the garage without any other mud than that thrown up by passing vehicles.

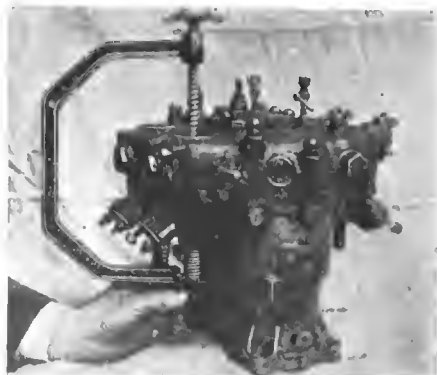
HOW TO GRIND HIGH SPEED TOOLS.

FROM *THE MECHANICAL WORLD*.

High-speed steel tools can be ruined very easily in the machine shop by grinding them on the emery wheel until they get hot and then plunging them into water. After doing this, the cutting edge of the tools will be found full of cracks. An American writer cites the case of a machine foreman who complained that the tool dresser was cracking the tools in hardening, but a careful investigation showed that the tools had been cracked by grinding in this way. The man was instructed how to grind the high-speed tools properly, and that put an end to the trouble from cracks in the tools.

A NEW AND EFFECTIVE VALVE TOOL.

An improved method of dismounting and grinding automobile valves is made possible by the tool illustrated herewith. By its use any person can dismount a valve entirely unaided, and without fatigue, simplicity being one of the good features of the tool.



VALVE TOOL IN WORKING POSITION.

As shown in the illustration, the valve spring has been contracted by simply screwing down the screw bolt, and the cotter pin is about to be withdrawn. To use the same tool for grinding valves, a kind of screw-driver is inserted in the opening at the base of the tool and held in position by a set screw, the appliance being then used as a brace, and the valve ground with much more ease than by the usual methods.

The tool is a French invention, placed on the market by M. Etienne Baudot, 231 Boulevard Pereire, Paris. It has been well received by French chauffeurs, and is already in use in a large number of garages. Although specially designed for the typical type of French motor shown in the illustration, and not adapted to certain American engines, the tool is certain to be adopted in this country.

A FAMOUS PIONEER MANUFACTURER.

Leon Serpollet, whose death was announced in a recent number of *THE AUTOMOBILE*, at the age of forty-eight years, gave proof of mechanical genius when a youth of seventeen. At this early age he built, entirely unaided, a curious wooden tricycle. At the age of twenty-three he had devised his first steam automobile, and in order to more profitably work out his idea removed from his native town of Culoz to Paris. He rented a small workshop and labored diligently at his new machines.

His first motor-driven vehicle was a steam tricycle with which, in 1888, he traveled from Paris to St. Germain, a distance of about ten miles. It was a curious single-seated structure with the engine carried behind the driver and had an unfortunate habit of overturning when rounding corners. At that time automobilists were an unknown quantity, and when Ser-



SERPOLLET IN HIS PARIS FACTORY.

pollet made application to the authorities for a license to drive his vehicle on the public highway he had to wait two years for the document. The license is dated April 17, 1891, and is the first driving certificate issued by the French authorities. After the single-seated tricycle came a larger two-seated machine with wooden wheels and engine in the rear and under the body. The most famous voyage on this machine was from Paris to Lyons, accompanied by M. Ernest Archdeacon, of aeronautic fame. Serpollet caused a sensation at this time by climbing the Montmartre hill at Paris, which has a grade of 17 per cent. In 1889 his first four-seated steam automobile was built at the Peugeot factory, and was exposed at the Paris exposition of the same year. From this time his success was rapid. His engines were adopted by the Paris Omnibus Company, and the extent of his business increased enormously. Partnership was entered into with Frank Gardner, under the title of Gardner-Serpollet, with works at Paris. About this time Serpollet gained considerable notoriety as a speed champion. In 1893, with a steamer which was christened the *Easter Egg*, he was the first to attain a speed of 75 miles an hour. For three years in succession he held the Henri de Rothschild Cup for speed records on the Boulevard des Anglais at Nice. At the end of last year Serpollet united with M. Darracq, in a combination known as the Darracq-Serpollet Company. Plans were laid for doing business on a gigantic scale, and it is probable that the company would revolutionize public transport service in Europe. Just as the works were nearing completion and at the time when Serpollet's name was on everyone's lips, a short illness carried him off in the prime of his career. The funeral service was attended by a huge crowd of automobilists and the general public.

Rollin H. White cabled a message of sympathy to the family of the late Leon Serpollet. The two men were firm friends and had much in common, for M. Serpollet upheld the reputation of the steam car in France just as Mr. White did in America and other parts of the world. Both worked along the lines of entirely eliminating the boiler and both were successful, although accomplishing their ends in an entirely different way. The best indication that their respective inventions were in no way alike is afforded by the fact that Rollin White secured patents in France on his generator and the several regulating and auxiliary devices, without in any way coming in conflict with the Serpollet patents.

LETTERS INTERESTING AND INSTRUCTIVE

Value of the Auxiliary Exhaust.

Editor THE AUTOMOBILE:

[597].—As an automobile user, I like to keep closely in touch with everything pertaining to the motor-propelled conveyance, and one of the details of gasoline-engine construction, concerning which I have somewhat of a hobby, is the auxiliary exhaust port. I cannot see why this feature is not more widely applied, since it unquestionably helps the cooling materially, besides appreciably increasing power and conferring other advantages. And surely it is simple enough. I am now running a car that was originally built in accordance with standard ideas of design, but to which I afterwards had auxiliary exhausts provided. The results have been in every way most satisfactory, with the natural consequence that I am unable to see why the same idea should not be applied to every engine built—air or water-cooled. Surely, the modern automobile engine is not so perfect that even the least possible improvement can be disregarded.

OTTO LEPPANEN.

Cheyenne, Wyo.

There is no question but that the auxiliary exhaust possesses considerable merits, among which are the ones you enumerate, but, like everything else, it also has objections. For one thing, unless some special arrangement is made to prevent this, oil is likely to blow out through the auxiliary exhaust port, thus wasting the lubricant as well as fouling the exhaust passages. As for simplicity it is true that a plain opening in the cylinder wall is hardly to be condemned as objectionable, but what about the extra piping required to connect it up with the muffler? And what about the further fact that in its most successful form, as applied to a well-known American air-cooled car, it is not deemed expedient to use it without a poppet valve to control its action? Nevertheless, it is of undoubted advantage as an aid to air-cooling, and there is now at least one American water-cooled car to which it is regularly applied, though it has been tried and discarded by prominent makes in the past. One of its greatest advantages is the relief it affords the regular exhaust valve from the onerous duties ordinarily imposed upon it. Not only is the major portion of the cylinderful of hot gases let out through auxiliary opening—what is left is greatly cooled by the consequent expansion before it passes out by way of the normal exhaust valve. The value of this effect is well attested by the immunity from pitting and warping enjoyed by the exhaust valves of engines equipped with the auxiliary relief.

Dismountable Rims and Removable Rims.

Editor THE AUTOMOBILE:

[598].—Will you please tell me, through the columns of your interesting periodical, what, strictly speaking, should be understood by "removable rim." Insofar as I have observed, the term first came into use in this country immediately after the winning of the Grand Prix last year, by a Renault car equipped with a device allowing the removal and replacement of complete, inflated tires. Now, however, "removable rim" seems to be used indiscriminately, not only in the sense just referred to, but also to denote that class of constructions simply facilitating the removal of the tire by some system of mechanical dismounting. In "The Automobile," as well as in other periodicals, I note that advertisers of systems of mechanical tire attachment do not hesitate to refer to their devices as "removable rims," even going so far as to point a direct analogy in pictures and text, when no such analogy exists. Is this not unwise, as well as unfair to the less well-informed portion of the automobile-using public, and could not some sort of concerted action be taken to create a nomenclature dealing with this subject, which could be by no possibility misunderstood?

Reno, Nev.

CHRIS. ELKINSON.

There is, undoubtedly, more or less of the misunderstanding you refer to, and, of course, there may be occasional instances of mild misrepresentation founded upon an indefinite use of terms that lack to begin with any clear definition. But it is scarcely possible to force usage, so we all must be content to wait until the situation clears itself in a natural manner. Already there is a tendency to apply the term "dismountable rim" to the type permitting the manipulation of inflated tire units, leaving "removable rim" to the other construction.

A Motor "Down by the Head."

Editor THE AUTOMOBILE:

[599].—Was glad to see my letter (No. 538) published in "The Automobile" of January 24. In answer to your inquiries, would say that I am sure the first cylinder gets more oil, for the reason that the spark plug in the said cylinder is always foul. Just the other day I was troubled with this cylinder missing fire, and when I went to take the plug out I found that the oil had worked around the plug, and was even on top of the cylinder. There is no serious overheating, scoring of cylinders or seizing of pistons. The oil I have been using is Mobil Oil A. I have this trouble all the time, even on the level. I am not sure that I keep a high enough oil level in the crankcase. I always feed enough oil so that there is a slight smoke at the exhaust. Do you think it advisable to drill a small hole at the bottom of the crankcase partition?

JOSEPH O. THOMAS.

Raleigh, N. C.

There appears to be no doubt of the fact that there is constantly an excess of oil in the forward part of the crankcase, and as everything else seems to be in proper condition, the only logical conclusion possible under the circumstances is that the engine on your car has either not been properly leveled or something has happened to the car "to bring it down by the head," to use a nautical expression. Try a level on it and see if this is not the case, making the test both with the car empty and with the passengers aboard, as the weight of the latter may account for the difference if examination should prove the engine to be level with the car empty. If the forward part of the engine is lower than the rear end, drilling a hole through the crankcase partition will serve to equalize the level to a greater extent than is possible where the partition at present keeps most of the oil forward of it, but there will still be too much oil in the forward end. The best remedy will be to level the engine. The set of the springs may be at fault.

Data Wanted on Engine Testing.

Editor THE AUTOMOBILE:

[600].—As an occasional reader of your paper would it be asking too much of you to lend me a little assistance in the matter of obtaining data and formula which will give accurately the brake test and apparatus necessary to make same for an air-cooled single and four-cylinder engine. I have an experimental plant at my local address, and these are my first products. I am now desirous of obtaining an accurate estimate of the power developed by my engine, which is of the four-cycle type without any carburetor or mixing valve, only valve-inlet being used. These original features, together with numerous others on which I hold patents, give me a great advantage, and, I believe, much higher efficiency than the modern automobile engine. It only remains to find some adequate means of measuring this power. Can you suggest some A-1 text or handbook which gives in detail light on the subject of Prony brake tests?

Toronto, Ont.

A. G. RONAN.

While a great deal has been written on the subject of engine testing in the shape of monographs and magazine articles, so far as we have been able to ascertain, there is no hand or textbook on the subject extant. Practically every volume on the gas engine includes a chapter or two on this subject, such as "The Gas Engine," by Hutton, or the "Gas Engine Handbook," by E. W. Roberts. We should be pleased to learn the result of your tests.

The Geared-flywheel Idea.

Editor THE AUTOMOBILE:

[601].—With the present straining for lightness and efficiency in automobile engines, how does it happen that no one ever seems to think of applying a flywheel driven by multiplying gears off the crankshaft, instead of directly mounted upon it? It seems to me that the obvious advantages of a great balancing effect with a very light weight would be secured in this way, because by making the flywheel small and running it much faster than the engine, it would do all that could be done by a larger wheel. And, besides its smallness, it could be so raised above the crankshaft that it would have less of a tendency to reduce the road clear-

ance than is present with the ordinary construction. Of course, the complication would be slightly increased, but I cannot see why two simple gears and a couple of extra bearings should stand in the way of the other advantages. I understand that the flywheels of many of the best automobiles weigh 100 pounds or more, and certainly, anything ought to be desirable that would eliminate three-quarters of this or more, in this way adding just that much to carrying capacity.

H. H. WEBB.

Garden City, L. I.

Every fact that can be urged in favor of the geared flywheel, except one, is in favor of it. That one, however, is sufficient to condemn it. It has been proved again and again, by tests and experiments made by the ablest engineers, that it is impossible to make gearing so perfect that it will run smoothly and continue to run smoothly without backlash or lost motion. And when it is realized that 1-500 of an inch play between a flywheel and the shaft on which it is mounted will occasion all sorts of serious trouble, due to the frequent reversal of stresses, it can be understood that gearing interposed between the power-developing element and the balancing element is hopelessly impracticable. The best results have been secured with herringbone gears, but even with these no real success has been achieved.

How to Clean Out a Radiator.

Editor THE AUTOMOBILE:

[602.]—I have been trying to find an article on cleaning out radiators in the back numbers of "The Automobile," but do not recall the date, and have been unable to put my hand on the number. If I remember aright, the use of caustic soda was advised, but I do not know how strong a mixture to use nor how long to let it remain, so will you kindly let me know when the article in question appeared, or give me the information desired?

Morristown, N. J.

B. MARSTON SMITH.

We do not recall the article you mention and have not found any specific reference to caustic soda in anything that has appeared on the subject of cleaning radiators within the past few months. A ten to twenty per cent. solution could be employed, dissolving the soda in hot water, and it would not be apt to damage the metal by permitting it to remain several hours, or even over night. We should, however, recommend the use of what is known as a pickling solution as being much more convenient than soda. This is made of sulphuric acid, or what is usually known commercially as vitriol, the proportions being about the same, though a ten per cent. solution will doubtless be found strong enough for all purposes. Mix with cold water by pouring the acid into the water slowly, never the reverse. The two combine chemically and considerable heat is evolved; if the acid be poured into the water too fast there is danger of cracking the vessel, which should be glass or porcelain. Let the solution cool before using. The sulphuric acid immediately attacks the copper or brass of the radiator and will clean it in a comparatively short time. The best way to follow the progress of its action will be to draw some off from time to time, refilling with fresh solution. When it runs off clear the process is at an end. The radiator should then be flushed out very thoroughly so as to eliminate every trace of the acid.

More Light on the Ignition Proposition.

Editor THE AUTOMOBILE:

[603.]—With a multicylinder engine, is the current consumption in extra proportion to the number of cylinders—that is to say, does a four-cylinder engine use four times as much current as a one-cylinder engine, and does a six-cylinder engine use half as much again as a four-cylinder engine? It is assumed, of course, that the motors run at equal speeds. I cannot see any reason why the proportionate current consumption should not be as I have stated it, all factors other than the number of cylinders being equal, but several friends of mine who use multicylinder cars say that their observation does not indicate anything like a proportionate increase in the current consumption.

JOHN HAGEN.

Brooklyn, N. Y.

It is perfectly obvious that the current required to produce sparks at four plugs in a given time must be four times as great as that required to produce a spark at one plug in

the same time, the plugs being the same and all other factors being equal. Probably the explanation of the contrary opinion you have found lies in the fact that most multicylinder cars run with less gear changing than is required for single-cylinder cars, so that though there may be more current consumed during each revolution of the motor there are less revolutions of the motor to a given travel of the car. Take, for instance, the case of two cars climbing a grade. One, a car with a powerful multicylinder engine, will take the grade on the high gear, with the crankshaft revolving rather slowly. The other, weaker, with a single-cylinder engine, will have to drop to the lowest gear and climb with the motor turning over at such extreme speed that the single cylinder will require nearly as many ignition contacts per given time or distance as is required by all of the cylinders of the engine in the other car, during the same time or in going the same distance.

Distance Stanleys Ordered, But Not Delivered.

Editor THE AUTOMOBILE:

[604.]—I was glad to see in your issue of February 14 "How a Stanley Agent Feels About It." My back has been up for some time, and were I a Stanley agent I would have taken a fall out of someone long ago. Your paper, as well as the others, has never used the Stanleys fair in reporting the races entered by them. I and others believe this to be simply owing to the fact that they are not advertisers. In the races they have entered they have given odds, but never asked any; all their races have been won fairly, and always a light-powered car against a heavier one.

I had to smile to see Mr. Stanley at Mt. Washington two years ago in a fully equipped stock runabout—no freak—while the others were in overalls and grease and stripping their cars of every available ounce. He easily made the ascent in record time, taking Mrs. Stanley along with him, and she is no featherweight. I am proud to say I know the Stanleys well; their drivers, Marriott and Durbin, and their Ormond Beach racing rig. I would like to have someone tell me where the freak element comes in on this car, except in the shape of the windshield. The machinery is identical, except in size, to their regular output; the construction of engine, boiler and connections being the same. The shape of outside is odd but very practical, and Marriott probably owes his life to its light construction. Most reports of accident gave the impression that it was owing to a breakdown. As I understood it, a bad place in the course was to blame, Marriott took long chances at this particular spot, and none realized it as well as he did; but that was his job. It was a shame that while the laurel wreaths were flying around a year ago one of them did not hit him. The driver of the 200-horsepower foreign freak got it, but I am just Yankee enough to think it did not belong to him. They called him "Speed King," but he certainly sat in the second row.

They who think that Stanley cars are only fit for short dashes know very little of them; I see no reason why they should not enter even the Vanderbilt race with fair chance of winning. They would have to take water every fifty miles, but could easily spare the time—the advantage they would have getting away on the turns would more than make up for time lost in watering. There is no automobile made so easy on tires, and this would go a long way to help win. I hope to see one of these cars entered in a long distance race, and when it does I will wager there will be more come the cry-baby act than at Ormond. I am, of course, a Stanley owner, and most enthusiastic over my little rig that is always ready for a 500 to 1,000 mile run.

Portland, Me.

HENRY R. STICKNEY.

For the 1906 American Elimination trial of the Vanderbilt Cup race, Charles J. Swain and John N. Wilkins, Jr., two well-known members of the Cape May Automobile Club, placed orders, after consultation with F. O. Stanley, for two steam racing cars. Subsequently Secretary J. Hiscock, of the Cape May Automobile Club, made a thorough explanation of the entire matter, and it appears on page 297 of the September 6, 1906, issue of THE AUTOMOBILE. If the Stanleys can construct a long-distance racer there is no reason why they would not receive a commensurate amount of publicity. Up to date it remains a fact that two such racers were ordered and not delivered, and it is an additional fact that the cars were actually constructed, and apparently found unsatisfactory, for Messrs. Swain and Wilkins saw fit to make public a signed statement in reference to the non-delivery.

Fording Streams with Carbureter Submerged.

[605.]—We have occasion in this part of the country where very few of the streams are crossed by bridges to make more or less frequent fords, and, in some cases, the water is quite deep. I would like to have you tell me how a stream can be forded when the carbureter is under water. R. W. EATON.
Watsonville, Cal.

We very much fear that this is a case in which the suggestion of the small boy is most apt to be in order. "Git out and push." It is evident that if the water level reach a point where the carbureter is submerged totally, it must perforce cease operations and the motor will in turn do likewise. If you know the bottom of the river to be safe at the point in question—i. e., free from treacherous holes or rocks and the stream is not too wide—the expedient usually adopted in such cases may serve. That is, to rush the ford, trusting to the momentum gained while the engine continues to run to carry the car to the opposite bank. This is done quite frequently in the case of narrow streams.

REGARDING SALE OF RENAULTS IN AMERICA.

Editor THE AUTOMOBILE:

[606.]—Regarding the matter of Renault Freres representation in this country, I wish to make clear to the public through your valued publication that we, the Renault Freres Selling Branch, are the direct branch house of Renault Freres in this country and are the only authorized agents. I will go further and state that no other concern can buy any Renault cars direct from the factory—all Renault cars in this country have to be purchased from the Renault Freres Selling Branch, or its authorized agents, which are as follows: Cryder & Co., New York City; Palais de l'Automobile, 1778 Broadway, New York City (who have a contract with us both for 1907 and 1908); C. P. MacNamara, New York City; J. L. Keir, 310 North Broad street, Philadelphia; Pardee & Canary, 1218 Michigan avenue, Chicago; Quinby & Co., Newark, N. J.

I have noticed in several papers that the C. A. Tilston Company advertise themselves as successors to Renault Freres Agency, trying to make the public believe that they are successors to ourselves. The positive facts are as follows:

Bernin and Tilston had a contract with Renault Freres, which expired September 30, 1906, and which was not renewed. Renault Freres, of Billancourt, France, decided to open their own branch house in New York, which is known as the Renault Freres Selling Branch. Owing to the fact that the firm of Tilston & Bernin could not make any contract with Renault Freres for 1907, Mr. Bernin severed his connection with Mr. Tilston, and is now with me as superintendent. Mr. Tilston has no right whatever to use the name of Renault Freres Agency, or call himself successor to Renault Freres Agency, as he is not. C. A. Tilston & Co. are successors to Bernin & Tilston and nothing more. Mr. Tilston has some cars left on his 1906 order, which, of course, he can sell, but he has no cars for 1907.

I would further state that all the cars delivered to Renault Freres Selling Branch bear our special plate, protecting them against any claim arising from the Selden patent. We are not licensees, and we defend all our customers against any prosecution from the Selden association. All purchasers of Renault cars should request their cars delivered with our special license plate in order to be sure of being protected in the event of any trouble arising from Selden patent.

I hope this letter will impress upon the public what the real facts are, and destroy any misunderstanding which may have occurred through misleading advertisements.

PAUL LACROIX, General Manager,
Renault Freres Selling Branch.

New York City.

THE EFFICIENCY OF FRICTION DRIVE.

Editor THE AUTOMOBILE:

[607.]—One of the most interesting questions at present before automobile engineers is the one relative to friction transmission. The accepted type of friction transmission seems to be that involving a flat-faced disk, which is traversed by a wheel rimmed with some frictional substance. So far as we have been able to find, this device does not occur in other field of power transmission, except in connection with very small powers, and the obvious reason for its rarity seems to be that it is a faulty element, both in theory and in practice.

It is obvious that all points in any radius drawn in the revolving disk are moving at different speeds. It is equally plain that the traversing wheel can only revolve at one speed at a time. It would seem, then, that this is the case: One line in the rim of the traversing wheel follows a line in the disk, all other

points in the line of contact slipping to a greater or less degree. Small wonder that under such conditions the friction rim requires replacing after comparatively few miles of car-travel.

All data regarding friction-transmission which is at present accessible naturally deals with the rationally-designed spur and bevel-frictions, but a glance at this data serves to make more glaring the faults of the traversing-disk transmission. Some time ago a series of exhaustive tests were conducted at Purdue University to obtain facts relating to friction transmission. From the results of these tests we find that a friction-wheel (spur) 24-inch diameter by 2-inch face at a speed of 1,000 revolutions per minute will transmit 11.42 horsepower, when the pressure between the surface is 150 pounds per square inch, which pressure was found to be most efficient. Now, a representative designer of the traversing-wheel device transmits, or says he transmits, 24 horsepower through a wheel 20 inches diameter by 2 inches face at practically all speeds of his motor. As pointed out before, this device has only a single point of perfect contact, while the device from which the foregoing data was obtained brought into play a 2-inch line of contact. Wherein lies the discrepancy? The only possible means of increasing the capacity of the transmission would be to increase the pressure between the friction-surfaces. This, needless to say, wastes enormous power through friction and throws unnecessary strain upon all parts of the mechanism. In view of these facts, some brake-tests taken from the transverse shaft would prove interesting.

It might be well to say that the foregoing has been written entirely from the standpoint of a student of mechanical engineering and is in no way dictated by partiality to any particular car.

W. Lafayette, Ind.

LOUIS RUTHENBURG.

MORE LIGHT ON CURRENT CONSUMPTION.

Editor THE AUTOMOBILE:

[608.]—I have been much interested in the discussion that has been running through your columns, concerning the amount of current consumed by the ignition systems of different engines, varying in accordance with the number of cylinders. One important point, though, I think has been missed by all of your correspondents, this having to do with the "surge" of current following immediately upon each contact. Each of these surges takes much more from the battery than does a single contact for a longer period, and therefore is a factor that cannot safely be left unconsidered. In fact, with many cylinders, and ordinary high-tension ignition with battery, I believe it can be shown that the current consumption is less when the vibrator is kept buzzing continuously and the current commutated only in the secondary. The Dock five-cylinder motor shown at the National Motorboat Show, at Madison Square Garden, New York City, during last week, had such an ignition system, and the makers claimed a very much lower current consumption than when a contact breaker was used in the primary.

Mt. Vernon, N. Y.

ERNEST KOBBE.

THE ORIGIN OF THE WORD LIMOUSINE.

Editor THE AUTOMOBILE:

[609.]—With further reference to the query of Funk & Wagnalls as to the origin of the word limousine, it may be interesting to state further that the type of half-closed-in carriage body which now, in automobilia, bears the name, is a species very common in Bas-Limousin, now the Département du Corrèze of modern France. The Paris carriage builder who gave this name to his carrosseries may have been from the Limousin; probably was, but the limousine is a type of carriage body for a sort of diminutive stage coach—already in use for long years, perhaps centuries, in that particular part of mid-France which was formerly the Limousin. The French peasants' sabot, if it is an ample, full-bodied one and not a mere shuffleboard, is also a limousine, being of the same origin.

FRANCIS MILTOUN.

Jonquiers—Martigues B. du R., France.

NO AUTO FATALITIES IN VERMONT.

Editor THE AUTOMOBILE:

[610.]—On page 324 of "The Automobile" of February 14 is a paragraph on Vermont's low ratio of automobile accidents. The paragraph shows how fast an arrow will travel. The St. Albans "Messenger" spoke inadvertently of one death from automobiles, but did not say that the death was that of a Vermont woman while visiting in Springfield, Mass.

The truth is that there was not one killed in Vermont during 1906 by automobiles, directly or indirectly. I called the attention of the St. Albans "Messenger" to its editorial in which, I told them, the inference would be that somebody had been killed in Vermont by automobiles; they corrected the statement in a subsequent edition.

Barre, Vt.

JOHN W. GORDON.

COPPOCK ONE-TON COMMERCIAL CAR



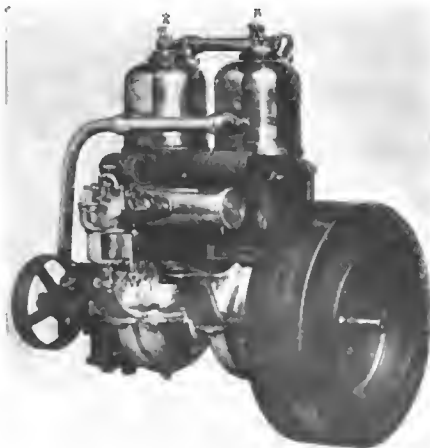
IN view of the totally unskilled class of drivers into whose hands commercial trucks are usually placed, it would appear that the two-cycle type of motor should be particularly suited for this class of work, for obvious reasons. More than this, such vehicles are expected to run eight to ten hours a day and seven days a week with a comparatively small amount of time in which to overhaul them, so that it will be evident that nothing can be too simple to insure regularity of running coupled with endurance. The latest entrant into this field is the Copcock Motor Car Company of Marion, Ind., and in designing trucks for this purpose every effort has been bent toward preserving that utter simplicity of design and fewness of parts which tends toward the realization of a foolproof piece of mechanism—something that is of paramount importance, considering the purpose in view. For the present this firm is specializing on one and three-ton trucks, bodies being built to order.

Motor.—The power plant of the one-ton truck known as Model A consists of a two-cylinder, two-cycle motor of the three-port type, the cylinder dimensions being 4 1-2-inch bore by 5-inch stroke. They are cast without water jackets and the exterior of the cylinders round the jacket space is machined in order to insure a perfectly round cylinder at all points and to equalize expansion. A spun copper jacket weighing but 16 ounces complete is em-

ployed and is held in place by hexagonal bronze nuts top and bottom, permitting its ready removal and providing insurance against leaks at these points. The weight of the finished cylinder, minus its jacket, is 16 1-2 pounds, so that complete it only weighs 17 3-4 pounds. Its appearance without the jacket is clearly revealed by the illustration, showing cylinders ready for assembling

The cylinders are finished by a special reamer, the pistons and rings being ground to size. The last named are the Cartwright type of steam packing rings, the outer ring being 5-8 inch wide by 1-8 inch thick and split at 45 degrees. This is the master ring and under it are two eccentric rings measuring 3-16 by 1-8 inch. All the rings are held by a single pin passing through the lap of the master ring and between the two eccentric rings, an allowance of 1-16 inch in depth of the ring groove over the height of the two rings being made to facilitate lubrication. Exhaustive tests have shown this method of arranging the rings to be proof against carbon deposits working under them, which is said to be a more or less common fault with the two-cycle engine. The crankcase is of a special aluminum alloy, the lower half being made in two pieces flanged together at the center to permit of adjustments being made on either rod without the shaft dropping out during the operation. The crankshaft bearings are babbitt and bronze, the outer bronze shell having 24 studs cast on it, extending through the babbitt lining. The babbitt metal is forced into these shells under heavy hydraulic pressure and afterward machined to size in order to produce the best possible wearing surface. Three 4-inch bearings support the shaft. The latter is a hand forging of 30-point carbon steel and is finished all over, the journals being ground to size. The big end bearings of the connecting rods are split in the usual manner but are overlapped as in steam practice. Each half is held by a 3-16-inch dowel to prevent the hox from rotating. These holes are drilled with special jigs so as to insure perfect fitting of renewals, which is an important consideration.

Motor Accessories.—The carbureter is of the standard float-feed, automatic compensating type. One set of hardened nickel-steel spiral gears working at a 45° angle, serves to drive both the water-circulating pump and the timer, the timer shaft being mounted on three ball bearings, due provision having been made for adjustment in case of wear. The driving gears are encased in a bronze housing at the front of the motor and work in grease. The pump is of the standard gear type, having 3-4 inch inlet and outlet. The remainder of the cooling system comprises a vertical



TWO-CYCLE POWER PLANT COMPLETE.

fin tubular radiator placed forward under the footboard and having 176 lineal feet of tubing. It is supplemented by a four-bladed fan belt driven directly from the crankshaft, provision being made for maintaining the belt tension by means of an adjustable vertical support. The fan itself is mounted on ball bearings carrying sufficient oil for a year's service without replenishing supplies.



FINISHED PISTON AND RINGS.

Lubrication. — A gear-driven, force-fed oiler provides a positive means of lubricating the piston and connecting rods. One oil lead terminates at a boss on the outside of the cylinder communicating with a groove 3-16 inch wide by 1-8 inch deep inside the cylinder. This groove extends around from one side

of the piston pin to the other, thus entirely surrounding the piston with the exception of the space occupied by the pin, which is 1-8 inches in diameter. This groove is never uncovered by the travel of the piston, the latter coming within 1-8 inch of it at top and bottom. For the lubrication of the big end bearings the piston pin is hollow two-thirds of its length. A second oil lead registers with this hollow end. The wrist pin is drilled so that when the crank is in a vertical position oil is fed to the end of the rod, and when in a horizontal position the hole in the pin registers with a tube running down the channel of the rod to the big end. This system has been designed to run with a minimum amount of oil and no waste, and to test its efficiency the crankcase of a car that had been in service steadily for two months was removed and found to contain hardly an ounce of oil in the bottom of either of the compartments.

Grease is used to lubricate the crank journals and is fed from cups placed on the dash, the leads consisting of 3-8-inch 18-gauge copper tubing. Placing these cups away from the heat of the engine prevents the grease from melting and also keeps them under the eye of the driver at all times.

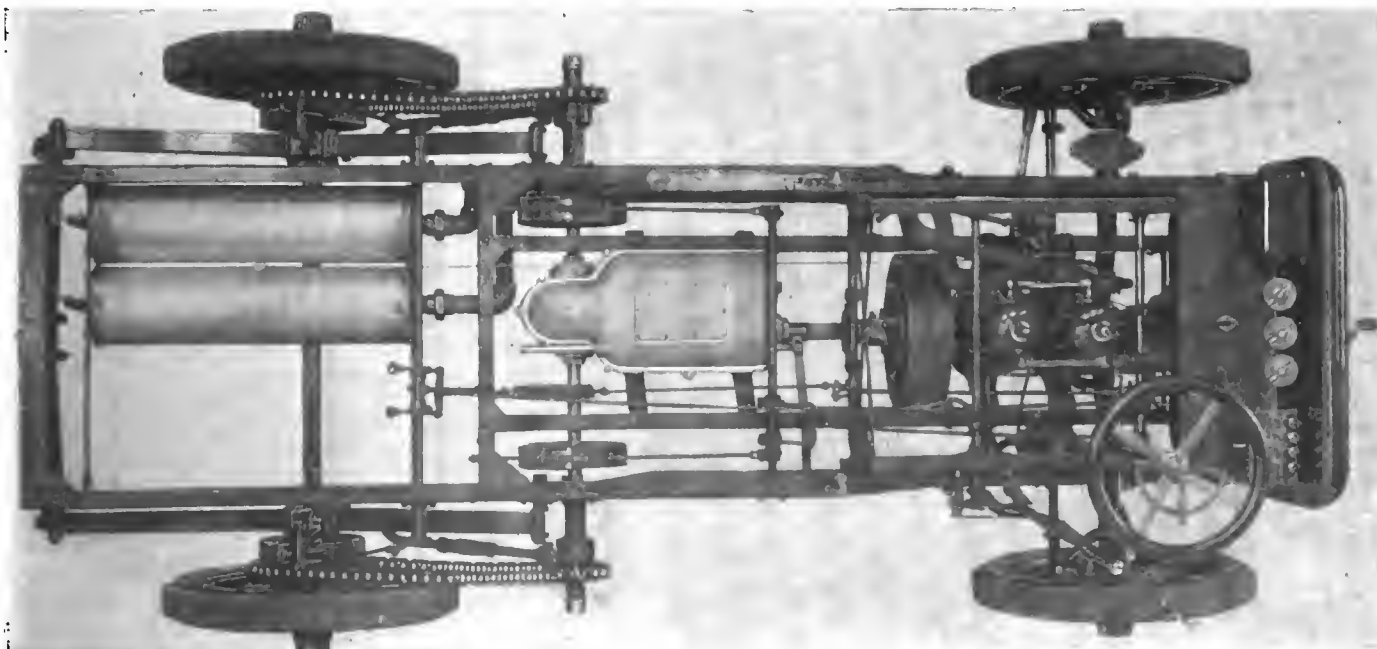
Transmission.—The clutch is of the internal expanding type, consisting of a bronze shoe 10 inches in diameter and having a

2 1-4-inch face, 8 per cent. of which consists of cork inserts. The two parts of the shoe are hinged and expanded by means of a flat cam; they are supported by a cast steel web, the drive being taken from this point to the square shaft of the transmission. The latter is of the progressive type providing three speeds forward and reverse, the pinions all being of hardened nickel steel with a 1-inch face of 6 pitch. The bevel pinions are also of the same material but of 4 pitch. All shafts run on Timken roller bearings of large size. The cross countershaft is squared where it passes through the differential case to permit of easy removal. The outer ends of this shaft run on American roller bearings. Final drive is by means of generously proportioned double side chains.

Running Gear. — The frame is of cold-pressed nickel steel, supported on semi-elliptic springs front and rear, the former measuring 2 by 40 inches and the rear 2 1-4 by 48, both having eight leaves. These are supplemented by a cross spring at the rear measuring 38 inches in length and also having eight leaves. The front axle is a 1 3-4-inch drop forging of I-beam section, while the rear is a 1 3-4 piece of square section. The wheels are 32 inches in diameter and run on Timken roller bearings. They are shod with 3 1-2-inch solid Diamond tires front and 4-inch rear. Brakes are carried on the cross countershaft, one being placed on either side of the differential, in addition to which there is a set placed in drums on the driving wheels, the latter being of the contracting type, cast steel shoes bearing on a steel drum 10 inches in diameter by 2 1-2-inch face. As is customary in touring car practice, the former set or countershaft brakes are operated by a pedal and used for running while the hub brakes are operated by a side lever and constitute the emergency.



CYLINDER AND JACKET SHOWING LOWER RETAINER.



HOW THE CHASSIS OF THE COPCOCK COMMERCIAL CAR LOOKS FROM ABOVE, WITH BODY DISMOUNTED.

AUTO CLUB NEWS FROM ALL SECTIONS

Windy City Autoists Prepare for a Season of Activity.

CHICAGO, Feb. 24.—The directors of the Chicago Motor Club have accepted the resignation of President William H. Arthur and named F. C. Donald to succeed him, choosing David Beecroft to fill Mr. Donald's place on the directory. It has been decided to arrange for a reliability contest, a hill climb, an economy test and a braking and skidding contest. The first three events were held last summer by the Chicago Automobile Trade Association, but the Chicago Motor Club believes that the dealers will be pleased to turn over these affairs. The braking and skidding tests are a new venture and it is believed will provide a novel and interesting competition. To handle these events a committee has been formed consisting of Charles P. Root, chairman; Joseph F. Gunther and Walter L. Githens.

Rules for the economy test have already been outlined, though the event will probably not take place until next August. There will be an eliminating competition over a 100-mile course and three cars will qualify for the finals against the Silent Knight machine, instead of one as first proposed. This means that four high-powered machines will be in competition for the trophy which the Chicago Motor Club will purchase with the \$500 check put up by Charles Y. Knight when he challenged any car in the country to an economy test. The test will be over a 100-mile course and the final over a 300-mile route, the last part taking three days to decide. Touring machines only are eligible; they must weigh about ten and a half pounds to the cubic inch of piston displacement and must carry a stipulated load of dead weight. No limit will be placed on the size of the machines, competitors are free to make any carbureter adjustments they desire, curtains may be placed over the radiator and fans disconnected, but no additional water supply can be obtained. A standard body and tires must be used as well as a standard gasoline tank; the placing of a tank on the dash will not be allowed.

Considerable activity is being shown in the Chicago district on the signboard movement. Joseph F. Gunther, chairman of the runs and tours committee of the Chicago Automobile Club, is trying to secure the co-operation of the Chicago Motor Club and the Chicago Automobile Trade Association with his own club to give to the district a complete series of signboards.

Chicago automobilists are only partially satisfied at the recommendation of the American Automobile Association to start the Glidden tour from their city. Formal action in the matter was taken when the Chicago Motor Club appointed a committee to work for the terminating of the tour at Chicago. The committee favors a start in New York City and a westerly run by what is known as the national route leading through Syracuse, Rochester, Buffalo, Cleveland, Toledo, and South Bend. It is expected that the two other auto associations, the Automobile Club and the Automobile Trade Association, will form similar committees and that the three will work together for the common end.

Edw. Kneeland Elected President Pittsburg Club.

PITTSBURG, PA., Feb. 25.—At the annual election of the Automobile Club of Pittsburg, held February 18, the following board of officers were elected for the ensuing year: President, Edward Kneeland; first vice-president, George E. Painter; second vice-president, W. N. Murray; third vice-president, Frederick Byers; secretary, Paul C. Wolff; treasurer, George G. Glass; board of governors, one year, William P. Baum; two years, Jno. C. Bragdon; three years, Philip S. Flinn, Dr. John A. Hawkins, C. M. Miller. The attendance and interest shown were greater than at any time in the club's history. The treasurer's report showed the organization to be in excellent condition financially, and the report of the secretary showed an increased membership list.

Jersey Autoists Eat Their Annual Dinner at Newark.

NEWARK, N. J., Feb. 25.—The third annual dinner of the New Jersey Automobile and Motor Club, which has now a membership of 800, took place at Achtel Setter's Wednesday evening of last week. Autoists from all sections of the State were present, and among the guests were State Commissioner of Motor Vehicles J. B. R. Smith, of Trenton, and Winthrop E. Scarritt, of East Orange, ex-president of the A. A. A. A number of plans were discussed informally, covering all fields of automobiling, sporting, legislative, touring and the holding of various tests of public utility. Mr. Scarritt, who was the principal speaker, said that New Jersey had more miles of macadam road than any other State and of the 4,000 miles in the United States this State boasts of 1,100 miles. Soon the greatest friend of the automobile would be the New Jersey farmer, because the good roads that are being constructed will increase the price of every farm. Considerable interest was displayed in the plans for the five or six-day endurance run that the club has decided to hold early in the spring, probably late in April or early in May. It is proposed to map out a 500 or 600-mile tour, probably into Pennsylvania, with rules framed somewhat on the lines of the Glidden Cup tour regulations. They will be stringent enough to provide that the cars must not only cover the prescribed distance without making repairs, but also within a stated time. H. A. Bonnell, secretary of the club and chairman of the contests committee, expects to announce the route and conditions very shortly.

R. I. Automobile Club Names Its Standing Committees.

PROVIDENCE, Feb. 25.—Standing committees for the current year were appointed at the recent meeting of the board of directors of the Rhode Island Automobile Club. With the election of the new house committee, the entertainment committee passed out of existence, the functions of both committees being combined in the house committee, of which Dr. Church retains the chairmanship. On the runs, tours and contests committee Eugene M. Sawin takes the place of R. Lincoln Lippitt.

In addition to selecting the make-up of the committees, the directors named its representatives on two of the boards of the American Automobile Association. Four new names were also added to the membership rolls. The personnel of the chairmen of the committees is as follows: Membership, Charles O. Read; house, Dr. Wm. P. Church; runs, tours and contests, Elliot Flint; laws and ordinances, Dr. Julian A. Chace; auditing, B. J. Horton.

Elliot Flint was chosen to represent the club on the touring committee of the A. A. A. and J. Jerome Hahn was reappointed as the Rhode Island representative on the law committee of the National Association.

Complete Harmony in Missouri on Legislative Matters.

ST. LOUIS, Feb. 23.—Roy F. Britton, secretary of the Automobile Club of St. Louis, has taken exception to the statements published in THE AUTOMOBILE of February 14 relative to automobile legislation in the Missouri General Assembly. Complete harmony, declares Mr. Britton, prevails between the St. Louis and Kansas City clubs. The two bodies have always worked in unison, and up to the present time there has been no disagreement between them and only the best of feeling prevails. No automobile was used at Jefferson City to make demonstrations to members of the Legislature. The Botsford bill referred to is a bill introduced by Mr. Botsford at the request of the Automobile Club of St. Louis. The St. Louis and the Kansas City clubs had each a representative at Jefferson City to further the interests of the bill, but they are working in perfect accord.

In connection with the St. Louis automobile show, to be held in the Jai Alai Building from April 1 to 6, an automobile floral

parade will be held on the morning of Monday, April 1. It is expected that at least 150 machines will take part in the parade, which will go over the downtown streets. Ten silver cups will be awarded to the best decorated machines. Dave Strauss, promoter of the show, states that while in Chicago he made arrangements to have the moving pictures of the Vanderbilt Cup exhibited at the St. Louis automobile show.

The members of the St. Louis Automobile Club have approved of the plan to establish a chauffeurs' information bureau. Club members have pledged themselves to employ only drivers who possess certificates issued by the club secretary. Drivers will be required to file an application stating their occupations during the last five years, give references to their character and their ability to operate machines. If the secretary is satisfied with the information the applicant will receive a certificate, which will entitle him to consideration for employment by club members. By this plan it is hoped to materially reduce the number of irresponsible drivers.

Ohio Valley Autoists Elect Officers.

WHEELING, W. VA., Feb. 23.—At a recent largely-attended meeting of the Ohio Valley Automobile Club, held in this city, a constitution and by-laws, prepared by Attorney F. A. Chapman, of Wellsburg, were adopted and the annual election of officers was held, resulting as follows: President, M. F. Giesey, of Wheeling; vice-president, F. A. Chapman, of Wellsburg; S. Ott Laughlin and A. W. Paull, of Wheeling, and S. W. Meals, of Moundsville; secretary, T. A. Westmeyer, of Wheeling; treasurer, A. A. Wheat, of Wheeling. A board of directors consisting of six members was also elected.

It has been decided by the club to place danger signs along the roads wherever they are needed. An amendment to the bill now before the legislature limiting the speed of automobiles to four miles an hour is now being prepared and will propose a six miles limit. Several other changes are also asked for, some reducing the existing penalties and others asking for an increase, it being the opinion of the club that the present penalties err in some cases by leniency and in others are unnecessarily severe. The club has a membership of forty owners of automobiles.

Denver Autoists to Build a \$10,000 Clubhouse.

DENVER, COL., Feb. 22.—Ten thousand dollars will be invested in the new clubhouse of the Colorado Automobile Club, the preliminary plans for the erection of same having been submitted to and approved by the members at the recent annual meeting of the club. Probably there was never a more successful club, considering the length of time since its founding and the difficulties to be contended with, than the combination of good citizens which bears the name of this grand State and automobile club as the other two-thirds. A good roads movement has been so ably pushed that indications are that within a short space of time tourists from all over the world will flock to Colorado with their cars to enjoy this unsurpassed climate, scenery and the coming unsurpassed highways.

The annual election resulted as follows: President, Dr. F. L. Bartlett; vice-president, J. W. O'Connor; secretary, Dr. W. H. Bergtold; treasurer, Louis Searing; two additional members of the executive committee, F. O. Stanley, J. H. Carson. James H. Pershing, a prominent member of the Denver bar, delivered an entertaining lecture on "The Law of the Road."

Wisconsin to Form a State A. A. A. Association.

MILWAUKEE, Feb. 25.—Wisconsin automobilists can now become affiliated with the American Automobile Association through a State organization. At the recent meeting of the Milwaukee Automobile Club it was decided to organize a State division of the A. A. A. in Wisconsin, and Secretary Drought will apply for admission into the national body at once.

James Drought was recently elected a director of the A. A. A., and it was chiefly through his missionary work that Wisconsin was brought into the fold.

THE AUTOMOBILE CALENDAR.

AMERICAN.

Shows.

- March 2-9.....—Minneapolis, Automobile Show, First Regiment Armory, Minneapolis Automobile Dealers' Ass'n.
 March 2-9.....—Chicago, Second Annual Power Boat Show, Seventh Regiment Armory. W. C. Andrews, manager, 19 E. Huron St.
 March 4-10.....—Kansas City, Mo., First Annual Automobile Show, Convention Hall. Frank L. Woodward, manager, Willis Wood Theater Building.
 March 9-16.....—Boston Automobile and Power Boat Show, Mechanics' Hall and Horticultural Hall, Boston Automobile Dealers' Association. C. I. Campbell, mgr.
 March 13-16....—Omaha, Auditorium, Second Annual Automobile Show, Omaha Dealers' Association. T. Gillman, manager.
 March 18-23....—Providence (R. I.) Automobile and Power Boat Show, Infantry Hall. F. M. Prescott, manager.
 April 1-6.....—St. Louis, Mo., Automobile Show, Jal Alai Building, St. Louis Automobile Dealers' Association.
 April 6-13.....—Montreal, Canada, Second International Automobile and sportsman's Exhibition. R. M. Jaffray, manager, 309 W. Notre Dame Street.
 April 8-13.....—Pittsburg, Pa., First Annual Show of the Pittsburg Automobile Dealers' Association, Duquesne Garden.

Races, Hill-Climbs, etc.

- April 8-9.....—Harrisburg, Pa., Two-day Endurance Run, Automobile Club of Harrisburg.
 May 30.....—Philadelphia, Hill Climb, Quaker City Motor Club.
 Oct. 19.....—St. Louis, Mo., International Aerial Race for the Gordon Bennett Prize. Aero Club of America.

Motor Boat Races.

- June 8.....—670-Mile Ocean Motor Boat Race, New York to Bermuda. Motor Boat Club of America and Royal Bermuda Yacht Club.
 July 20.....—New York to Marblehead, Mass., 270-mile Motor Boat Race. New Rochelle Yacht Club.
 Sept. 2-6.....—Jamestown (Va.) Exposition, Motor Boat Races.

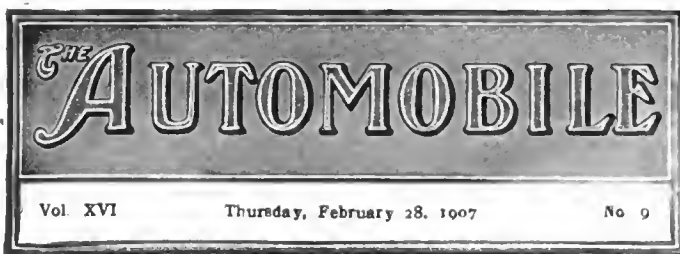
FOREIGN.

Shows.

- March 7-16.....—London, Olympia Commercial Vehicle and Motor Boat Show.
 March 15-23....—Edinburgh, Scottish Cycle and Motor Show.
 April 6-13.....—London, Agricultural Hall Motor Show.
 May 4-15.....—Madrid, Spain, Automobile Exhibition, Palace of Fine Arts, Royal Automobile Club of Madrid.
 May 15-26.....—Zurich, Third Annual Swiss Automobile Show.

Race Meets, Hill Climbs, etc.

- March 20-27....—Nice (France) Automobile Week.
 April 1-16.....—Spring Wheel Competition, A. C. of France.
 April 2-15.....—Monaco Motor Boat Exhibition and Races.
 April 21.....—Targa Florio Tour (Sicily), Auto Club of Milan.
 April 25-28....—Touring Contest, Automobile Club of Touraine.
 April 28.....—Chateau Therry Hill Climb.
 May 24-27.....—Vulturette Contest, Automobile Club of Austria.
 May 29-June 1..—Irish Automobile Club Reliability Trials.
 June 3-12.....—Herkomer Cup, Automobile Club of Bavaria.
 June 14.....—German Emperor's Cup, Taunus Circuit, Imperial Automobile Club.
 June 20-22.....—American Gold Cup, Start from New York of European Tour for American Cars. Georges Dupuy, secretary, 1402 Broadway, New York City.
 June 14-29.....—Scottish Reliability Trial, Scottish Automobile Club.
 July 2.....—Grand Prix, Automobile Club of France.
 July 14, 1908....—Paris to London, Aerial Race.
 July 15-18.....—Ostend Week, Record Trials, Automobile Club of Belgium.
 July 21.....—Ardennes Circuit (Belgium).
 July 31.....—Liedekerke Cup for Touring Cars, Ardennes Circuit, Belgium.
 July 31-Aug. 8.—Belgium Regularity Contest for Touring Cars. A. C. of Belgium.
 August 1-7.....—Criterium of France, 1,750 Miles Touring Competition and 250-mile race for the Press Cup. (Exact dates to be fixed.) A. C. of France.
 Sept. 1.....—Italy, Brescia Circuit, Florio Cup. A. C. of Italy.



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**European Autoists Have In less than two months Europe
a Mixed Program.** will have opened its annual competitive campaign, and the small army of professional drivers will once more be plunged into the strenuous life. The slack period is only of short duration, for the return home from the autumnal Vanderbilt contest is followed by a few minor competitions, and it is not until the end of the year that the racing and demonstration machine is allowed to take its ease. April 21 Italy will set the ball a-rolling with its Targa Florio, driven by officialism to the island of Sicily. Germany enters the arena shortly after with its Herkomer Cup contest for amateur drivers, and its Kaiser Cup race with ninety-two professional drivers. July will be ushered in by the French Grand Prix in Normandy, with the Sporting Commission Cup as a feeble prelude. Attempts will be made to lower world's records at Ostend during the middle of the month, and towards its end Belgium will organize its Ardennes Circuit for racers and Liedekerke Cup for fast tourists. The first week in August will see the familiar crowd of auto enthusiasts in the neighborhood of Trouville for the tourist competition and race that the Marquis de Dion has at last persuaded his club to undertake. Britishers will betack themselves to the Isle of Man towards the close of the summer to glory in the tourist race which the cast iron laws of the Empire forbid on the mainland. Brescia, in Northern Italy, will be the scene of a big September race. Minor contests will fill in the gaps between these big events and carry the season along until the muggy weather of November puts a cloud over all.

The outstanding feature of the European program is its diversity. There is intense activity but no unanimity as to the most profitable type of contest. France has abolished the old weight limit and imposed a fuel allowance of such latitude that there is no fear of a diminution in the speed of her flyers. Italy and Germany have something in common in that both have imposed a limited cylinder area; Belgium remains true to old conditions, and Great Britain has its fuel allowance hedged around with numerous restrictions.

This condition of affairs is not altogether advantageous. Each nation is proud of its own formula and jealous of the success of rival events. The manufacturer has his difficulties, for under the new conditions he is unable to participate in as many events as formerly, owing to the diversity of regulations and the impossibility of building a special machine for each race. That the year will be a profitable one cannot be doubted, but it will prove the necessity of more uniformity of action.



The Two-Cycle Motor for Commercial Use.

There appears to be every reason to believe that the two-cycle motor will find its first great development in the field of the gasoline-driven commercial vehicle rather than in the pleasure type. For unvarying reliability, coupled with great endurance, no mechanism that is to be trusted to the tender mercies of an unskilled driver can be made too simple. What appears to the mechanically versed to be the very acme of simplicity, not infrequently puzzles the uninitiated unduly, its very lack of apparent complication lending it an air of mystery. Be this as it may it is obvious that the two-cycle type of motor, with its lack of small moving parts, offers a very high factor of safety against breakdown in the hands of drivers whose knowledge is so limited that they are apt to overlook such a thing as the need of lubrication.

The power plants of such vehicles must, not alone, be as nearly fool proof as it is possible to contrive them, but they must also be as nearly automatic as it is possible to make such a piece of machinery. The two-cycle motor lends itself to these requirements admirably. In the three-port type, which appears to represent the most advanced form in use to-day, there should be no need whatever for the driver to pay attention to anything other than the regularity of the lubrication and the needs of driving during the course of a day's work of ten or twelve hours. Moreover, the absence of small parts removes the temptation to fuss and fiddle in the attempt to find, what is more frequently than not, a wholly imaginary wrong. By giving such trucks a reasonable amount of attention night and morning, by one versed in their mechanism, it should be possible to keep them running through an entire season's work without serious repairs. In other words, without any necessity for being in the shop any oftener than the ordinary dray or its four-footed power is.



All-the-Year Autoing Now Holds General Sway.

Nothing has accentuated the fact that there is no longer a closely defined automobile season so strongly as the easily demonstrated superiority of this form of transportation during the extended periods of inclement weather that have marked the present winter. The transition from the time when it was considered a worse than profitless undertaking, by all but the few who gloried in a strenuous pastime, to keep a car out of storage once the ground was covered with snow, to the present, when it is an exceptional case in which a car is put away at all, has been very rapid. The closed body has brought comfort with it, but only the vastly improved reliability of the machine as a whole has made its continued use under such conditions a possibility.

There is still a closed and open season, however, though the line of demarcation is no longer well-defined. While the majority of autoists now keep their cars in commission the year round, it is principally for city use or short trips when the weather favors. Touring is still a summer pastime, and balmy weather marks the coming of the open season.

AMERICAN DRIVERS FOR AMERICAN CARS.

Albert L. Pope, first vice-president of the Pope Manufacturing Company, commenting on the next Vanderbilt Cup race, expresses the following views:

"The subject of another Vanderbilt Cup race is of widespread interest, not only throughout the United States, but across the Atlantic. A good many inquiries are being made concerning the details of this event, and I have on many occasions expressed myself to the effect that we expect to enter several cars for that race. We feel that it is not an essential feature to fix a maximum limit of horsepower in the contesting machine, although we do believe in the present French system of fixing an outside limit of weight.

"The season of the year has been more or less discussed, but we are inclined to the opinion that October furnishes the best environment and weather conditions to run this contest, and we know of no better place in America than the new automobile highway on Long Island, provided that is completed in season. Otherwise, any course similar to the one already used on Long Island, which would cover a distance of approximately 300 miles, seems most advisable. Long Island is particularly well located, and its topography well suited to the general conditions required in a fair automobile contest of this kind.

"We are strong believers in the policy of having American machines driven by American-born citizens, and we would like to see the next Vanderbilt Cup race run under approximately these conditions, with the addition of such other details in arrangements as are found necessary to the proper regulation and safe-guarding of the contest."

THOMPSON SAYS PARKWAY WILL BE READY.

"Enough of the Long Island Motor Parkway sufficient for the holding of the Vanderbilt Cup race will be completed beyond any possible doubt," said Chairman Jefferson DeMont Thompson, of the A. A. A. Racing Board, when asked the other day, probably for the thousandth or more time. Duncan Curry, of the *New York American*, was the questioner, and according to what Chairman Thompson told him, the race may take place in the vicinity of Riverhead, which will be at the east end of the parkway. Since the international balloon race of the Aero Club of America will take place at St. Louis, October 19, it appears probable that October 12 will be the date of the Vanderbilt race, the American Elimination trial being held a fortnight previous. Mr. Thompson is treasurer of the parkway, in addition to being chairman of both the Racing Board and the Vanderbilt Cup Commission. Therefore, he should know what he is talking about.

MARRIOTT ACTS AS A STARTER AT ORMOND.

ORMOND, FLA., Feb. 22.—At some impromptu automobile races held to-day at the Ormond end of the beach, Fred Marriott, who nearly lost his life at the recent meet, acted as starter, and has apparently thoroughly recovered from his frightful experience met with in the wrecking of the Stanley "Teakettle." To-day's winners included C. W. Seamans, of Brooklyn, two-mile event; W. A. Adriance, of Poughkeepsie, potato race, and R. H. Kimble, of Omaha, obstacle and novelty races; J. H. McCarthy, of Boston, figured as the winning owner in the motor boat race, in which there were seventeen participants.

FRANCE AFRAID OF THE INVADER?

A cablegram from Paris to the *Sun* announces that *Les Sports*, one of the leading French daily automobile journals, violently attacks the proposed tour of American automobiles through France as dangerous to the French industry, and demands that it be prohibited. *La Presse*, a leading evening journal, concurs in this demand. Both papers maintain that if American manufacturers want to advertise the capabilities of their cars they should enter the French tests or allow French cars to participate in the tour.

CHRISTIE'S GRAND PRIX ANNOUNCEMENT.

Walter Christie, the solitary American entrant for the Grand Prix, last week gave an informal dinner at Martin's, New York City, which function was utilized by Mr. Christie in informing the metropolitan press representatives of his intention to compete in the big French race. Besides the press men, the guest list included Alfred Reeves, Sumner Healey, ex-Senator Barcus of Indiana, S. M. Butler, J. B. Lozier, Samuel Bogart, A. Carter, Georges Dupuy, and Harry Treadwell. Louis Strang, who will serve as mechanic, as in the past, on the Christie craft, was also present. The newspaper men told Mr. Christie that he had supplied them with more or less sensational news in the past, and they hoped that the foreign chapter which he was to contribute would be equally interesting. The indefatigable American intends to locate on the French course several weeks before the race and become thoroughly familiar with every kilometer. The Christie racer is very nearly completed, and will be ready for trying out in less than a month.

NEW JERSEY'S REVENUE FOR ONE YEAR.

TRENTON, N. J., Feb. 25.—Commissioner J. B. R. Smith, of the Department of Motor Vehicles, estimates that the automobile receipts for the fiscal year ending May 1 will be about \$80,000, which money will be expended in repairing the improved roads of the State, providing the legislature legalizes this expenditure.

Up to January 1 the department registered 13,759 vehicles and issued 15,269 licenses to drivers. At that date the amount of fees collected was \$62,233.91. The receipts of the department in January for registration and licensing amounted to \$1,193.17, and at the close of business last Saturday the receipts from these sources were \$506, making the total receipts from May 1, \$63,933.08.

Up to January 1 there had been collected \$991 in fines. In January the fines collected amounted to \$111 and in February \$470, making the total receipts from this source \$1,572.50. The aggregate receipts of the department to date are \$65,505.58.

"DIPLOMAED" CHAUFFEURS INELIGIBLE.

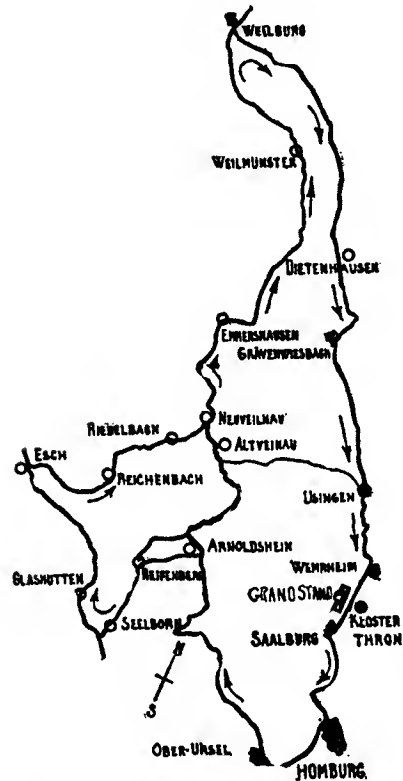
As in every other walk of life, the man who has gained his knowledge of automobiles entirely in the hard school of experience looks down contemptuously upon the would-be chauffeur and his "book-learning." To judge from the statements of some of the speakers at the preliminary meeting of graduates of the New York West Side Y. M. C. A. to form a club, the contempt takes the form of positive enmity. "College graduates" need not apply, seems to be the feeling, and the advice to say nothing about being such was freely handed round. After much discussion, it was finally decided to call the new organization the Motor Club of the West Side Y. M. C. A., though the last part of the name occasioned much trouble, and it was seriously proposed to omit it owing to the prejudice referred to. The lengthy appellation was finally adopted, however.

MORA CAR MAKES INTER-CITY RECORD.

One of the cars exhibited by the Mora Motor Car Company, of Rochester, was run to the Buffalo show under its own power in the record time of 2 h. 30 min. Mr. Mora made this statement in the course of a conversation, and A. Vernon Hart, a Rochester dealer who has had experience over the roads in question, immediately laid a wager that it could not be done in such a time under prevailing conditions. The wager was accepted. Driven by W. M. Birdsall, its designer, the car left Buffalo at 8 A.M. Sunday, reaching Batavia at 9:07, where Ray Hollis took the wheel. The entire drive was in the face of a blizzard, but the car arrived at Rochester at 10:13:45, having done the distance in 2 h. 13 min. 15 sec., or with 16 minutes and 15 seconds to spare. Robert Thompson and William Likly acted as referees and timed the arrival of the car at the Rochester end.

EMPEROR'S CUP HAS 92 ENTRIES.

BERLIN, Feb. 15.—Five European countries will this year organize five important speed contests, all on different lines. England has its Tourist Trophy, a speed test for touring machines with a limited fuel supply and a weight limit; France has its Grand Prix, a racing event pure and simple, with a limited but generous fuel supply; Italy holds to its Targa Florio, with a limited cylinder area; Belgium has its fast Ardennes circuit, in which racers must submit to the old weight limit, and Germany has its Emperor's Cup, nominally for touring machines, but in reality for racers with a limited cylinder volume.



OFFICIAL COURSE FOR EMPEROR'S CUP.

The main regulations of the German event, which will be held June 14, are cylinder volume limited to 10.56 pints; minimum wheelbase, 118 inches; minimum height of seats, 93.4 inches; minimum weight, 2,585 pounds; road clearance, 6 inches. Ninety-two entries have been received for the race, the number being the largest on record for any speed contest. The nations represented are: Germany and Austria, 33; France, 23; Italy, 20; Belgium, 10; England, 4; Swiss, 2. Owing to the large number of contestants, some difficulty has been experienced in finding a suitable circuit, and for a time it was thought that the number of cars per firm would have to be reduced from three to two. This has been avoided by lengthening the course to seventy-five miles without any controls or neutralizations. Even with this length of course the leading cars will be round to the starting point before the last starters have begun their run, but special precautions will be taken to prevent accidents from this cause.

As will be seen from the accompanying map, just issued by the Automobile Club of Germany, the course is a modification of the Taunus circuit, on which the 1904 Gordon Bennett race was run. On that occasion the course was taken left-handed; this year the German race will be run right-handed. The headquarters of the circuit will probably be Kloster-Thron, a few miles to the north of Saalburg, where the Gordon Bennett headquarters were fixed. From this point the arrival of the racers can be seen for a considerable distance; they will descend the hill towards Werheim and climb up the short hill leading to the grandstands.

It is expected that the Emperor will be present in person at the race, and every effort will be made to make the grandstand worthy of their royal occupant. The Imperial pavilion will occupy a central position with a grandstand on each side, the whole placed obliquely so as to obtain a good view of the machines from the time they begin to descend the hill towards the grandstands. Seventy thousand dollars have been received in entrance fees, and the club officials declare that they will not spare the funds to obtain a perfect course and elegant stands. The weighing-in ground will probably be at the west side of the course, a considerable distance from the start. A special loop has been built on the course to allow of turning after the race.

GRAND PRIX DATE IS JULY 2.

PARIS, Feb. 18.—Although no official announcement has yet been made, we are able to state that the Grand Prix of the Automobile Club of France will be held on the Dieppe course on Tuesday, July 2. In fixing a date account has to be taken of the local markets, for although the Norman population is enthusiastic over the auto race, and would make no objection to the pulling down of a bridge or the stoppage of the entire railroad service, the disarrangement of the little country markets would not be tolerated. As Tuesday is the only day on which no market is held in the towns on the course, it will certainly be the day chosen for the race. A formal assurance has been given by the prefect, the local deputy, and other officials that a subvention of \$20,000 will be handed over to the Automobile Club of France and that certain road improvements will be carried out and the telegraph service reorganized at Government cost.

It has been practically decided to erect the grandstands at Pollet, four miles from Dieppe, facing the sea, and on the side of the triangular course running parallel with the English Channel. This is conceded to be the most suitable spot and will be accepted if satisfactory terms can be made with the owners of the land on which it is desired to build the stands.

Entries for the Sporting Commission Cup, to be run on the same circuit as the Grand Prix, only number nine, as follows:

- | | |
|-------------------------------------|------------------------------|
| 1. Gillet-Forest (De la Touloubre). | 6. La Bulre (———). |
| 2. Darracq (Wagner). | 7. Porthos (Strickert). |
| 3. Darracq (Hanriot). | 8. H. I. S. A., Italy (———). |
| 4. La Bulre (———). | 9. H. I. S. A., Italy (———). |
| 5. La Bulre (———). | |

These machines will cover about three hundred miles on exactly half the fuel allowance given to the Grand Prix racers. The contest was put forth as a rival to the German Emperor's Cup race, which has now obtained 92 entries, and was expected to unite a big number of machines of approximately the same horsepower as those for the German event, though running under entirely different conditions. With such a diminutive entry list the club officials have decided that it is impossible to run the race as a separate event, and the Sporting Commission Cup will consequently be run the same time as the Grand Prix. Here difficulties arise, for Wagner and Hanriot of the Darracq team and Strickert of the Porthos firm have been entered as drivers in both events. Should either of these firms object to the late change in the conditions of the race, there will be a deadlock. The failure of the Sporting Commission Cup could not be more complete, for, excepting Darracq, none of the five firms have had experience in long-distance speed contests.

WELCOMES THE GOLD CUP TOUR.

Commenting on the visit to Europe of American automobilists engaged in the American Gold Cup tour, Charles Faroux, one of the best known of French automobile writers, says that the project is one of special interest. "In the new world there are no roads; in the old countries, on the contrary, the national highways are one of the countries' glories. The organizers of the tour have wished to prove to the Yankees that a tour in Europe is not especially reserved to a few millionaires, but that a family of five can travel through these wonderful countries in automobiles cheaper than by rail, and in the hands of the agent who would treat them as so many bundles. This is not an American invasion, as some appear to think, for transatlantic manufacturers know full well that the hour of the Yankee commercial superiority will certainly not be in 1907. On the contrary, the desire of those engaged in the tour is to contemplate for once, and very widely, the marvelous panoramas of Eastern Europe. It is a project of the highest interest, which cannot fail to directly impress the prosperity of our tourist regions; that is why we will accord all our assistance to the American chauffeurs to assure them a welcome as worthy of them as of us."

NEWS BUDGET FROM BRITAIN.

LONDON, Feb. 20.—The chief recent event of competitive importance has been the preliminary test of the Side-Slip Prevention Competition. Out of the original total of forty-one devices entered, twenty-seven were rejected as impracticable at the examination of the drawings and withdrawals further reduced the number, with the result that only seven devices remained for the test at the Clement Talbot Works. The track had been carefully covered with a mixture of mud and soft soap, and on this compound the 'buses to which the devices were fitted had first to effect a sudden stop with brakes hard on, and in the second test a double right-left turn was attempted. The results were anything but encouraging, and the only effective device seemed to be Molesworth's six-wheeled vehicle, with back and front steering. However, the abnormal conditions created by the presence of the greasy compound must have materially affected the efficiency of the remaining six devices, and possibly better results will be attained in the long-distance trial in London streets, which completes the competition.

The 5,000 miles tire trials will be postponed till the spring of 1908. The best time of the year for these trials is February and March, and it has not been possible to make a start this month. Half of the trials will be run in England and the remainder in France.

Since the beginning of the year there has been the customary round of provincial exhibitions, few of which contain any improvements or alterations on the models introduced at Olympia. The show season will culminate in the Agricultural Hall Exhibition early in April, but before this event commences there is to be the big Commercial Vehicle Exhibition at Olympia, from March 7-16. The Society of Motor Manufacturers and Traders promotes this show, which is really an overflow of the November Olympia, and interesting evidence of progress in commercial vehicle and motor boat construction may be expected.

Probably the longest officially observed motor car trial yet entered upon commenced on Monday from the A. C. G. B. and I. clubhouse. A standard 30-horsepower Siddeley is now following a carefully mapped out tour of 10,000 miles through Great Britain in charge of the club's observer, who will note every delay and adjustment. A rather interesting record should result, particularly in the case of the tires, which are fitted with tubes of the new rubber substitute, Elastes. The claims advanced on behalf of this unpuncturable and resilient compound by many motor authorities will thus be afforded good opportunity of confirmation.

MINNESOTA AUTOISTS HAVE A BILL TO KILL.

MINNEAPOLIS, MINN., Feb. 25.—A protest against the Nelson "anti-automobile bill," as it is known, which has been introduced in the Minnesota Senate, was made by the Minneapolis Automobile Club at a meeting at which representatives of the St. Paul club were present. The automobilists characterized the bill as "too absurd for consideration." It is drastic in its provisions, reducing the speed limit materially, requiring examination of drivers and owners, and allowing county commissioners to close roads to automobile traffic whenever deemed necessary. A campaign for the passage of the bill has been started in the southern part of the State, and papers and legislators are being flooded with "anti-automobile" literature.

POST & LESTER CO. SETTLE AT THE HUB.

It has been rumored that the Post & Lester Company, the big supply dealers of Hartford, Conn., have been contemplating a descent on Boston for some time, and the report has now been verified. They are opening a branch at 815 Boylston street, which will be in charge of E. L. Thompson, formerly with the Angier Company. The new store will be in operation by March 15, and will carry a very complete line.



FINISHING POINT OF ATLANTA CLIMB—ROAD WAS EXCELLENT.
Photograph by Percy H. Whiting.

ATLANTA HAS A NOTABLE HILL-CLIMB.

ATLANTA, GA., Feb. 22.—The first hill climb ever held in Atlanta was run off to-day, and, barring the refusal to act of the timing apparatus, the affair went off smoothly.

The best time of the day was made by John Toole in Ed Inman's Stearns car. He covered the seven-eighths of a mile in 1:06 1-5, winning the free-for-all with a big margin.

Next to the Stearns and D. C. Lyle's Apperson, which took the hill in 1:19 2-5, Lowry Arnold's Buick runabout was the star of the collection. This car won the race for runabouts in 1:38 4-5 and the event for cars listing \$1,500 or under.

A Stoddard-Dayton, with James Todd at the wheel, won the race for cars costing \$3,500 and under in 1:25 1-5, and also, with the same car, the race for cars listing \$2,500 and under.

Handsome cups were given in every event. So successful was this hill climb, in which there were twenty-nine starters in the various events, that local enthusiasts are planning an endurance run from Atlanta to Macon—a distance of about 200 miles over all kinds of roads, mostly bad, and a Fourth of July race, perhaps forty miles in length, from Atlanta to Roswell, Ga., and return.

APPRAISER'S DECISION REVERSED.

On a recent invoice of cars sent to this country by the Societe Mors, Paris, one of the machines was invoiced as worth 21,000 francs, while another was entered at 6,300 francs. They were turned over to Appraiser Fowler, who reported that the cars were of a value in excess of the invoice prices. An appeal was taken from this ruling, and in a decision by I. F. Fischer, the Board of U. S. General Appraisers sustained the importers, reversing the appraiser in the first instance.



STARTING POINT OF THE ATLANTA HILL CLIMB, FEBRUARY 22.
Photograph by Percy H. Whiting.

REASSURING SITUATION AT ALBANY, N. Y.

ALBANY, N. Y., Feb. 25.—So far, legislation affecting autos has not progressed beyond the committee and introduction stage. But three bills have been let out of committees, and they are all of a character desired by automobilists or not objected to except one; and that is desired by some owners who frequently drive to New Jersey or Pennsylvania, is retaliatory in its nature and not calculated to accomplish the object it seeks. These three bills are:

Assemblyman Young's bill amending the insurance law so as to permit the formation of companies to guarantee against loss or damage to property resulting from accident to a duly licensed automobile; or loss or damage resulting from accident to a duly licensed automobile. This bill has already passed the Assembly and is in the Senate committee on insurance. This is the farthest advanced of any of the auto bills.

The next in order of advancement is the G. H. Whitney bill, which was reported while the delegation of the New York State Automobile Association were in Albany last week and was shown to them and they expressed no objection to it and have not interfered with its progress. It is now on third reading in the Assembly. It is an act to fix and prescribe rates of toll for autos on toll bridges and toll roads. The law now gives the corporations owning the toll-bridges and toll roads the right to collect toll from drivers of horse-drawn vehicles. This is the first legislative measure which has seen fit to place the motor vehicle on an equality with the animal-drawn vehicle, and the autoists hail it as an encouraging sign of progress, since they have been submitting to restrictions which do not apply to other vehicles which injure the roads more than the automobile ever can. For the most part toll roads and toll bridges have been collecting tolls without this special warrant of law and fixing their own rates. The legislative committee of the State association deemed it a good bill to allow to pass, as it will establish a precedent for equality of vehicles on the highways.

The other bill which escaped from committee did so by reason of an oversight on the part of those watching the legislation here in Albany. It is the Weber bill, and is the retaliation measure to make non-resident owners of automobiles coming into this State register and take out a New York license, just as New Jersey and Pennsylvania laws require of New York autoists. This is the same as the Apgar bill in the committee on internal affairs, which the legislative committee opposed at the hearing last week so successfully that it was not reported. The Weber bill was sent to the general laws committee, which reported it out and it is now on second reading in the Assembly. Had Chairman Charles T. Terry made his argument before that committee it would probably have held the Weber bill as the Apgar bill was held. Mr. Terry informed the committee on internal affairs that the retaliation measure would do no good and it would only hit the two States mentioned above, and that in New Jersey the association's representatives had succeeded in convincing the authorities of the unwisdom of their law, and Mr. Frelinghuysen was preparing to repeal the objectionable clause.

Other Attempts in Automobile Law-making.

The bill of the late Assemblyman Stanley, to establish a State automobile commission to take care of the registration of automobiles and create a new State department with a legal end represented by a counsel at a fat salary, and a retinue of clerks to enforce the motor-vehicle law, is still in ways and means committee, where it died last year and where it is liable to remain.

That freak proposition of Assemblyman Stevenson to amend the motor-vehicle law to provide for a system of taxation of motor-vehicles by taxing each \$2.50 per seat in said vehicle was torn apart artistically and completely as a legal proposition and as proper legislation of any sort by Attorney Charles T. Terry,

who appeared before the Assembly committee on taxation for the New York State Automobile Association and the National Association of Automobile Manufacturers last week. It is an indefensible proposition, ridiculous in its terms, unconstitutional in form and altogether drastic and unusual in its penalty features. It is still in the committee, where it went on introduction, and even should the committee report it there is little chance of its being seriously considered.

Another vicious bill is the Hamn amendment to the town law, which has not been reported from the internal affairs committee, where a hearing was given on it last week. This bill in brief would confer upon any municipal corporation, such as a town, village or city, the right to enact its own rules and regulations for the use of public highways by motor-vehicles, and is an impossible proposition. Attorney Terry told the committee on internal affairs, and forced several of its members to acknowledge the justice and reasonableness of his contention, that no motor vehicle could use the highways at all under such conditions, as the bill sought to establish with a new and strange set of regulations on either side of an imaginary line dividing two towns or a town and a village. The legislators were insistent on some legislation which should properly restrain the automobilists who recklessly violate all rules of the road and take delight in causing discomfort and injury to others and showed it in their remarks on this bill at the hearing. But Attorney Terry argued that their proposed local regulations would not accomplish it, and that there was plenty of law now on the statutes, and the trouble was that those complaining did not learn its provisions and take proper means to enforce it. The same complaints at times could be made against reckless drivers of horses, both at night and in the daytime, but that did not warrant the enactment of oppressive, unjust and restrictive laws to govern the whole class of horse drivers, nor should it govern the minds of legislators in framing laws for the government of motor cars on public highways. The bill was not reported.

Another of the bills still in committee is the Northrup bill amending the motor-vehicle law to provide that "No person shall operate a motor vehicle on a public highway that is geared to run at a rate of speed greater than one mile in four minutes." This bill is in the general laws committee of the Assembly, where it was referred on introduction.

A measure introduced this week in the Assembly requires that automobiles be retained as security for the appearance of the person arrested for violating the law.

CONCERNING THE PROPOSED ILLINOIS LAW.

SPRINGFIELD, ILL., Feb. 25.—Some members of the Illinois legislature are objecting to certain provisions of the automobile bill introduced early in the session by Senator Humphrey. Opposition is heard particularly against a portion of Section 13 of the bill, which provides that "no city, town, or village, or other municipality shall have power to make any ordinance, by-law, or resolution limiting or restricting the use or speed of motor vehicles, and no ordinance, by-law, or resolution heretofore or hereafter made by any city, village, or town, or other municipal corporation within the State, by whatever name known or designated, in respect to or limiting the use or speed of motor vehicles shall have any force, effect, or validity, and they are hereby declared to be of no validity or effect."

The bill, however, would have motor vehicles used for public hire regulated, a provision in this respect reading "that nothing in this act contained shall be construed as affecting the power of municipal corporations to make and enforce the ordinances, rules and regulations affecting motor vehicles which are used within their limits for public hire."

A. A. A. TOURING BOARD REPRESENTS 32 STATES

THE Touring Board of the American Automobile Association for the current year has been announced by President W. H. Hotchkiss. It comprises 77 members and represents 32 States. While such a board in ordinary circumstances would prove unwieldy, it is understood to be the intention of Chairman F. B. Hower to divide the board up into numerous committees, each charged with some function and work important to the motorists of the country.

Chairman Hower has called a meeting of the board for Buffalo, March 1, at which time it will undoubtedly adopt board rules and subdivide its work. Among the representative motorists on this board are Paul H. Deming, Philip S. Flinn, H. W. Smith, J. C. Kerrison, Waldron Williams, L. E. Myers, Isaac Starr. The complete list follows:

American Automobile Association—Touring Board—1907.

CHAIRMAN, F. B. Hower, 760 Main street, Buffalo, N. Y.
SECRETARY, Dal H. Lewis, 760 Main street, Buffalo, N. Y.
CALIFORNIA—L. P. Lowe, 21 Presidio avenue, San Francisco; Chas. B. Hopper, 402 Laughlin Bldg., Los Angeles, Cal.
COLORADO—Dr. W. H. Bergtold, 610 California Bldg., Denver, Colo.
CONNECTICUT—Geo. W. Beach, 54 Main St., Hartford; W. L. Hatch, New Britain; Frank Miller, Atlantic Hotel, Bridgeport.
FLORIDA—Geo. E. Sebring, Daytona; Fred E. Gilbert, Jacksonville.
GEORGIA—Frank B. West, Macon.
ILLINOIS—A. D. DeMange, Bloomington; H. D. Grider, Decatur; L. E. Myers, 1117 Monadnock Bldg., Chicago; L. F. Hoy, Woodstock; N. M. Van Sicklen, 309 Michigan avenue, Chicago; F. H. Pietsch, Eighteenth and Canalport avenue, Chicago.
INDIANA—Herbert H. Rice, care of Pope Motor Car Co., Indianapolis; J. A. Spekenhler, Richmond; E. C. Briggs, Box 154, South Bend.
IOWA—A. H. Ruebsam, Davenport; Harold R. Wells, Des Moines.
KENTUCKY—Pike Campbell, Fifth Avenue Hotel, Louisville.
LOUISIANA—Hart D. Newman, New Orleans.
MARYLAND, Frank W. Darling, Pikesville; W. B. Littleton, Hagerstown.

MAINE—Chas. C. Adams, Portland.
MASSACHUSETTS—J. C. Kerrison, care the "Boston American"; R. C. Guptill, Maiden; L. H. Greenwood, Gardner.
MICHIGAN—Paul H. Deming, 128 Lafayette avenue, Detroit; C. S. Mott, Flint; H. E. Shiland, Jackson; J. R. Jackson, Grand Rapids; Edwin S. George, Detroit.
MINNESOTA—Geo. S. Daggett, Minneapolis.
MISSOURI—Jas. G. Butter, 4484 West Pine Boulevard, St. Louis; W. W. Cowen, 307 Board of Trade Bldg., Kansas City.
NEBRASKA—D. C. Bradford, care the Bradford Kennedy Co., Omaha.
NEW HAMPSHIRE—Herbert O. Prime, 61 Union street, Portsmouth.
NEW JERSEY—Chas. D. Cook, Paterson; Geo. Frisbie, Asbury Park; Henry W. Leeds, Atlantic City; Chas. S. Van Syckel, Trenton; Geo. E. Blakeslee, 2565 Boulevard, Jersey City.
NEW YORK—F. E. Barnes, Binghamton; J. P. McMurich, Oswego; R. H. Johnston, New York; Augustus Post, New York; Robt. E. Hopkins, Tarrytown; Howard Martin, Albany; Geo. H. Leonard, Auburn; F. M. Fast, Geneva; G. E. Mosher, Rochester; Chas. Jerome Edwards, Brooklyn; R. B. Billings, 211-2 Summit place, Utica; Waldron Williams, 254 West End avenue, New York; H. W. Smith, 701 East Washington street, Syracuse.
NORTH CAROLINA—Walter Sprunt, Wilmington.
OHIO—Foster H. Bradley, Cincinnati; Thomas Curtin, care the Curtin Williams Co., Columbus; F. E. Avery, 1197 Franklin avenue, Columbus; Chas. N. Coit, Cleveland; C. Gordon Neff, 3518 Teleford avenue, Cincinnati.
PENNSYLVANIA—Edw. Kneeland, 2301 Farmers' Bank Bldg., Pittsburg; Chas. J. Swain, Philadelphia; H. F. Rawlin, P. O. Box 472, Harrisburg; Isaac Starr, 240 Dock street, Philadelphia; Philip S. Flinn, 320 Diamond street, Pittsburg.
RHODE ISLAND—Elliott Flint, 212 Union street, Providence.
SOUTH DAKOTA—F. D. Fitts, Madison.
TENNESSEE—S. T. Carnes, 316 Tennessee Trust Bldg., Memphis.
TEXAS—G. A. C. Haiff, San Antonio.
VERMONT—W. H. Riddle, Cottage street, Rutland.
WASHINGTON—Alfred Bornstein, 315 First avenue, South Seattle.
WEST VIRGINIA—W. E. Minghini, Martinsburg.
WISCONSIN—Jesse L. Potter, Milwaukee; Richard T. Robinson, Racine.
VIRGINIA—Frederick Lewis, 510 Atlantic Trust Bldg., Norfolk.

CHICAGO WANTS THAT A. A. A. TOUR IN SOME MANNER

CHICAGO, Feb. 25.—The movement to have the Glidden Tour end in Chicago is gaining new supporters daily. The Chicago Athletic Club and the South Shore Club have now joined hands with Chicago Automobile Club and the Chicago Motor Club in an effort to secure the honor for Chicago. Both the Athletic Club and the South Shore Club would throw open their respective clubhouses for the entertainment of the guests should the committee see fit to make Chicago the objective point. The committee appointed last week by the Chicago Motor Club to endeavor to convince the Touring Committee of the wisdom of this choice of route has held several meetings, and is formulating plans upon which to act. This will include the extending of invitations to the Chicago Golf, Glenview and Onwentsia clubs to join with the Athletic, South Shore and Chicago Automobile clubs in keeping open-house for the Gliddenites should the committee end the tour in Chicago.

Activity of the Trade Association.

During the week the plans of the Automobile Trade Association for placing guide posts along the principal roads leading to Chicago and used by automobiles have assumed definite form. It is proposed to use a 2x24-inch signboard on a 5-foot angle iron post set in cement. The cost of these signs and the surveys which will have to be made will bring the cost of each sign up to at least five dollars for every one placed.

The second annual meeting and election of officers of the Trade

Association will be held next Thursday evening. The ticket nominated as the "members' ticket" is as follows: President, Joseph F. Gunther; vice-president, W. J. Mead; treasurer, W. L. Githens; secretary, Thomas Hay. The officers and members of the Trade Association feel gratified with the results of its first year's work and look forward with hopefulness to the success of the contests which will be arranged for the summer in conjunction with the Chicago Motor Club. These include reliability, endurance, economy, and braking and skidding contests.

President Ira M. Cobe feels that these are red-letter days for the Chicago Automobile Club, as the membership is increasing by at least twenty each week.

MARYLAND CHAUFFEURS HOLD ELECTION.

BALTIMORE, Feb. 25.—At the annual meeting of the Chauffeurs' Club, which was recently held at the clubrooms in the Mount Royal Garage, the following officers were elected for the coming year: President, William Stevenson; first vice-president, A. R. Qualey; second vice-president, Fred Charpait; secretary and treasurer, W. D. Wehland; board of governors, William Stevenson, William Thornberg, John Harris and W. T. Carter.

Following the election of officers an enjoyable smoker was held. The club was organized in 1905 with a few members, and since then its membership has been considerably increased.

BUFFALO'S SHOW A RECORD BREAKER.

BUFFALO, N. Y., Feb. 23.—Dai H. Lewis, manager of the Fifth Annual Show of the Automobile Club of Buffalo, said to-night: "This has been the most satisfactory exhibition since shows were held in Buffalo, and it means that there will be a similar event in 1908 on a much larger and grander scale. The attendance was larger and the sales were a substantial increase over a year ago."

Amid the screech and din of hundreds of automobile horns, the show came to its end in Convention Hall to-night. Thousands of Buffalonians attended the show every night, and delegations came from Rochester, Syracuse, Toronto, Niagara Falls, Lockport and small cities. "Sold" signs were many, and every exhibitor had one or more on the machines he displayed. So successful has been the 1907 exhibition that the talk of abandoning local automobile shows, which was the rumor several weeks ago, has dissipated, and the 1908 automobile show is already assured. The Great Arrow cars had many admirers, and some sales are reported as a result of their presence in the hall. The Thomas Flyers also called forth an abundance of admiration, while many persons desiring horseless transportation gazed admiringly at the Babcock electrics. The non-stop Thomas was on exhibition a part of the week, and the Thomas Vanderbilt car was also shown. The Great Arrow, which won the Glidden trophy, was shown by the Pierce Company.

MABLEY FAVORS ANOTHER OUT-DOOR SHOW.

When approached on the subject of an "automobile trade show week," in accordance with the suggestion made at the last meeting of the New York Automobile Trade Association, Carleton R. Mabley, of Smith & Mabley, Inc., was not altogether enthusiastic for reasons that appear.

"Of course, like any other new and untried proposition, it is hard to say whether or not the plan would be a good one," he said. "My personal opinion, however, is that in view of the fact that the various New York representatives receive their new models at different times, it would be an awfully hard proposition to select a week that would suit even the majority. The outdoor show that was held last year under the auspices of the trade association, as far as I could learn, was very successful, inasmuch as the event was in its infancy, being tried then for the first time. Many things were brought to the notice of the association, which, if the show were held again, would be taken advantage of and bettered. Therefore, I feel that another outdoor show would be preferable to a spring show week."

GOVERNOR WILL OPEN MINNEAPOLIS SHOW.

MINNEAPOLIS, Minn., Feb. 25.—The Northwestern Automobile Show, to be held next week, is rapidly approaching completion as to detail of decorations and exhibits. The Chicago show decorations have been received and are being installed, and an elaborate scheme of adornment has been built up around them. An elaborate program in connection with the show has been laid out, including music by the Minneapolis Symphony Orchestra. In the evenings noted soloists will appear. Governor Johnson and Mayor Haynes of Minneapolis are to officiate at the opening of the show, Saturday, March 2.

The entire Northwest is tributary to Minneapolis and St. Paul in the automobile field, and dealers, owners and prospective owners from all parts of Minnesota, Wisconsin and the Dakotas, and as far west as Montana, will attend the exhibition.

NEW HAVEN'S SHOW TO BE HELD MARCH 21-30.

NEW HAVEN, Conn., Feb. 25.—Arrangements have been completed for an automobile exposition to be held March 21-30 in the Second Regiment Armory. All of the local dealers will be represented, some of them entering as many as eight or ten cars. The Bridgeport Motor Company will have an exhibit of motor boats and engines, and two other large Bridgeport firms will be represented.

CLEVELAND SATISFIED WITH ITS SHOW.

CLEVELAND, O., Feb. 23.—George Collister, manager of the Cleveland automobile show, to-night said: "This show has done its share in demonstrating to the public the promising present and the great future of automobiling. Local shows unquestionably are of substantial value to the dealers of the cities in which they are held."

All week long Central Armory has held interested crowds, afternoon and evening, and the exhibitors, with scarcely an exception, expressed themselves as thoroughly satisfied with the results that have been secured. The artistic decorating of the show, with its absence of signs in the center of the building, was an attractive feature which brought forth much praise. It was a case of the commercial instinct being subordinated so as not to interfere with the artistic conception of the decorator.

While Clevelanders buy cars made in other cities, it is a fact that the majority of them make their selections from the home product, all of which were well represented in the show, and of course included Winton, Peerless, White, Baker, Cleveland, Royal, Gaeth, and R. & L. electric.

One of the impromptu pleasant social gatherings of show week was a dinner in the Bohemian room of the Cleveland Automobile Club, at which George Collister and W. F. Sayle were the hosts of the occasion. Those present included D. J. Post, W. E. Metzger, J. W. Gilson, James Becker, "Gov." Fred Castle, O. J. Woodward, G. J. Bradley, J. Cramp, L. C. Boardman, T. J. Wetzel and A. G. Batchelder. The rooms of the Cleveland Automobile Club answered for a general gathering place every evening, and Secretary Asa Goddard, in behalf of the club, extended the hand of welcome to the many visitors. One of the recent subscribers to the club's fund for the building of a model highway in the suburbs of Cleveland was John D. Rockefeller, who gave substantially.

A. M. C. M. A. TO FATHER ENGINEERS' SOCIETY.

According to officers of the American Motor Car Manufacturers' Association, the business of building automobiles is the only great industry that has no organization whose avowed purpose is general scientific research of the subjects of most interest to the members of the industry supporting it. That is, there has not been up to the present time any organization or society on this order that is open to all who wish to enter, regardless of trade affiliations. With this in mind, the American Motor Car Manufacturers' Association plans to foster an organization to be known as the American Society of Automobile Engineers. The members of the former will form a nucleus for the new organization, any designer of known ability being afforded an opportunity to participate in its meetings, and membership being open to all automobile engineers, whatever their connections may be.

It is expected that General Manager Alfred Reeves will issue a call for a meeting to organize the new society within a very short time. In addition to this, the A. M. C. M. A. is planning the establishment of a laboratory to further a higher grade of work of a similar character, the benefits of this, however, being confined to the membership of the organization. An option has been obtained on an old factory building at Yonkers, N. Y., and it is expected that the negotiations now under way will shortly be brought to a successful culmination, in which case a lease of the building will be taken and a complete plant for chemical and mechanical tests will be installed. Work on both the projects in question will be pushed, it being intended to hold the first meetings of the new organization during March, as it is planned to make them bi-monthly during the busy season of the year.

BOUGHT CARS OF HOME MANUFACTURE.

SPRINGFIELD, MASS., Feb. 25.—The Board of Fire Commissioners has decided to place an order for two 30-horsepower Model H Knox machines for the use of the chief and deputy chief of the department. The order was placed through Charles R. Culver, the city sales agent.



DAVID L. CANNON A PROGRESSIVE MICHIGAN AEROCAR OWNER.

AN UP-TO-DATE MICHIGAN STOCK BUYER.

DETROIT, MICH., Feb. 25.—With steady strides, the automobile is rapidly pressing forward and is being used to shorten distances and time in almost every line of work. One of the very latest uses for an automobile is novel indeed. David L. Cannon, a drover and stock buyer in the eastern part of Michigan, uses an Aerocar for getting about the country and looking up stock among the farmers. Many miles in a day can be covered in this manner, and the time spent between the different homes is practically nothing as compared with what it was when he made the same trip with a team of horses. It is during the winter months that the greatest rush of business is on. With his air-cooled car he drives up to a farm house, shuts off the power, leaving the machine anywhere, and is soon engaged in trying to make a deal with the farmer for his fatted cattle. This drover is a student of human nature. He has learned that one of the nearest ways to a man's heart is through his stomach, but that you can get pretty close by pleasing him. It is, therefore, a common occurrence to see him spinning along the road with the car filled with broad smiling agriculturists, who, perhaps, had never before ridden in a horseless vehicle. After such a ride very few objections are made even if Dave's price for beef on the hoof is not quite what they had expected.

The accompanying picture shows this up-to-date drover on a return trip, driving a herd of young cattle. He rides in his car, toots the horn, and, with his two Collie dogs, drives his purchases in a manner that is in keeping with the enterprising spirit of the man and the times.



MISS ZABELLE ENJOYING A CONSTITUTIONAL IN HER POPE-TOLEDO

AUTOMOBILING AS A WINTER PASTIME.

In its earlier days the automobile was a fair-weather bird pure and simple. Rain was sufficient to cause it to stay at home, and mud proved such a strong deterrent to its underpowered engine that pleasure was only to be found beneath fair skies and along smooth roads. At the head of the column is shown Miss Flora Zabelle taking a constitutional in Chicago's parks with the aid of her new 50-horsepower 1907 Pope-Toledo, while below, the leading ladies of one of the companies now playing in New York, Miss Agnes Cain Brown and Miss Lillian Hudson, are shown in Miss Brown's new 22-horsepower Berliet, which she has used regularly to take her back and forth between her home at Tarrytown-on-the-Hudson and the theater in the city.

Major C. J. S. Miller is seen in his new American Mors. Automobiles have been his hobby, and it is not too much to say that he has probably owned as large a number and as great a variety of different makes of cars as any amateur on this side of the Atlantic, not even excepting Colonel John Jacob Astor, who also has a strong penchant that way. For the first ten days of his American Mors ownership the Major ran up a total of 600 miles, all of which were through snow and no little part of it through heavy drifts, which were negotiated without difficulty.

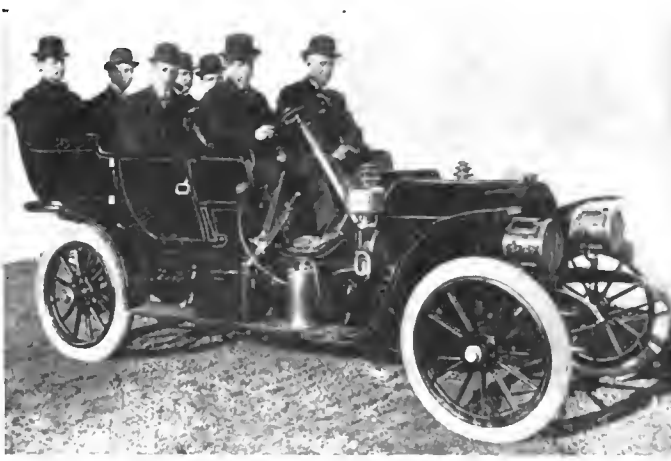
Equipped with chains on the drivers to procure the necessary traction, the modern automobile no longer fears the snow. It is a detriment, to be sure, for six inches or more of the "beautiful white" constitute a speed-reducer that has a marked effect on even the most powerful of cars, while heavy drifts frequently call for a shift of gear even on the level.



MAJ. C. J. S. MILLER WINTER RIDING IN HIS AMERICAN MORS



MISS AGNES BROWN'S BERLIET WHICH PLOUGHS THROUGH SNOW.



A 1907 MOON: DESIGNER L. P. MOOERS AND J. W. MOON.

MOTOR PARTS COMPANY, W. W. BURKE, MGR.

With headquarters at 25 West Forty-second street, New York City, a capitalization of \$100,000, and with W. W. Burke as its president and general manager, the Motor Parts Company is announced as a selling corporation partaking of the nature of a co-operative buying company. Mr. Burke will be well remembered as manager of the Electric Vehicle Company's Boston and New York branches, and associated with him are some prominent automobile tradesmen of wide experience.

"One of the greatest evils in the automobile business has been the taking of orders by parts people in excess of their production," said Mr. Burke, "and this has resulted in manufacturers being held up for their parts. A maker of parts would take orders for 6,000 or 7,000 sets to cover himself thoroughly, when he knew that his output would not be more than 5,000 sets. It was to remedy this trouble, besides securing inside prices, that a number of prominent manufacturers have interested themselves in this idea, which I have had in mind for more than a year. The company will handle only the very best products and only after they have been tested out in our laboratory at Yonkers.

"It is the idea of those interested to push only one article in a line, and to be able to assure our customers that the article in question is the best. The company intends to take outputs on a reasonable basis, thus relieving factories of the expense of selling departments. The accounts which we start with are such as to give the company a standing at once.

"The Motor Parts Company will be a sort of clearing house between the maker of the parts and the builder of the automobile, with the former being assured of a sale for his output and the latter being assured of deliveries and proper prices.

EZRA KIRK A TOLEDO GARAGE MAN.

Ezra Kirk, a well-known cycle trade graduate to automobiling, has resigned as sales manager of the E. R. Thomas Motor Company, of Buffalo, and in company with a brother will conduct a mammoth garage in Toledo, Ohio. Mr. Kirk's old home is in Toledo, from which city he went to Buffalo.

R. H. CRONINGER TO SELL PENNSYLVANIA CARS.

R. Harry Croninger, formerly Stoddard-Dayton sales manager, has gone with the Pennsylvania Auto Motor Company, Philadelphia, to act in a like capacity. It is understood that the Pennsylvania company intends to make extensive additions to its factory in the near future.

NOTABLE ADDITIONS TO EMPIRE TIRE STAFF.

H. H. Githens and W. R. Whitlock are well-known additions to the selling staff of the Empire Automobile Tire Company, of Trenton, N. J. Both were formerly of the G & J Tire Company.

C. A. BENJAMIN TO BE AEROCAR ADVOCATE.

C. Arthur Benjamin, one of the pioneers of the automobile trade, first with the Locomobile Company of America, then with the H. H. Franklin Manufacturing Company, and now leaving the sales managership of the Babcock Electric Carriage Company on March 15, will become vice-president and general manager of the Aerocar Company, of Detroit. Mr. Benjamin's change of base was somewhat unexpected, but it is understood that the inducements offered were of a substantial character.

WARNER LEAVES MUNCIE PARTS COMPANY.

H. L. Warner, up to recently connected with the Muncie Auto Parts Company, Muncie, Ind., has just severed his connection with that concern, and will organize a corporation to be known as the Muncie Gear Company, which will manufacture bevel and spur gears, sliding-gear transmissions of both types, disk and cone clutches, control levers and the like.

JAMESON GOES WITH DAYTON INTERESTS.

Charles Jameson, late of the Orlando F. Weber Company, Chicago, has given up the retail end of automobile selling for the wholesale, having just gone with the Dayton Motor Car Company as sales manager, and will from now on push the Stoddard-Dayton cars. He takes the place of R. Harry Croninger, who resigned recently to go with a Pennsylvania concern.

L. D. PARKER, BILLINGS & SPENCER DIRECTOR.

At the annual election of the Billings & Spencer Company, Hartford, Conn., which was held last week, L. D. Parker, formerly president of the Hartford Rubber Works Company, was elected a director to fill the vacancy caused by the death of Franklin Clark. All the other officers who served during the past year were reelected.

HOW FRANKLINS ARE SHIPPED NOWADAYS.

SYRACUSE, N. Y., Feb. 25.—The photograph gives a very clear idea of the cars now being furnished by the Lackawanna Railroad for automobile purposes. In construction these cars are cut along the line of furniture and wagon cars, except that the doors, instead of being directly opposite one another, are staggered in such a way as to make extremely easy the loading of motor cars. In size they are roomy, being high and wide, the inside measurements being 40 feet long, 13 feet 11 3-4 inches wide and 9 feet 4 5-8 inches high. These measurements are such as to admit of loading the largest Franklin cars with the top up, as will be seen in the photograph.



AUTO CAR NOW SUPPLIED BY LACKAWANNA R.R.

IN AND ABOUT THE AUTO GARAGES

ONE of the popular garages for automobilists touring in Northern New Jersey is that of the Perkins Automobile Company at Rockaway. This thriving Jersey town is situated on the Rockaway river, near Dover, on the road leading out from Newark to the north of the Oranges, and through Montclair, on



A MODERN GARAGE AT ROCKAWAY, NEW JERSEY.

the direct route to Port Jervis, N. Y. As will be noticed by the photograph, the garage is roomy, and the entrance arrangements show an appreciation of up-to-date requirements. The Perkins company are also agents for the Corbin car in that vicinity.

Rochester's Big Garage to Be Extensively Enlarged.

ROCHESTER, N. Y., Feb. 25.—Fulton Avenue Motor House has purchased the property adjoining it in the rear, and the buildings on the newly acquired property will be connected with the Fulton, thereby making one of the largest garages in the city. The property purchased has a frontage on Lake avenue of 92 feet, and is 225 feet deep. Lake avenue is one of the principal business and residence streets of Rochester, and is the main boulevard to Lake Ontario. During 1907 the business will be conducted under the name of "The Autohospital," as the management of the concern has been somewhat changed. Howard M. Stone, who has been exclusive manager for the past two years, has taken into partnership with him Charles D. Barrows, who was connected for four years with the Knox Automobile Company.

A Modern Garage for Vancouver Island.

VICTORIA, B. C., Feb. 20.—The Pilmey Automobile Company will have its new garage on James Bay ready for occupancy on May 1. The total cost of the building is estimated at \$10,000; there will be housing room for about forty cars. Advantage will be taken of the growing tourist traffic on Vancouver Island to run an automobile tally-ho with a capacity for carrying sixteen persons. Trips will be made at stated intervals during both winter and summer to various places of interest. The company, which will handle English cars exclusively, has a capital stock of \$100,000, subscribed by Victoria people.

Winnipeg to Have a Modern Garage at Once.

WINNIPEG, MAN., Feb. 20.—Canada's most progressive city is to maintain its reputation by shortly erecting the most modern garage that the entire Dominion can boast of. Though not as well situated regarding population or opportunities for the use of the automobile, Winnipeg is about set out to astonish its sister

cities further east. The new building is to be erected for Joseph Maw, and construction will be started as soon as the weather permits, which in the Northwest means much later than here. The property, which has a frontage of 66 feet and a depth of 200 feet, is now occupied by a livery stable, so that it will be another instance of horse giving way to the automobile. The construction will be of steel and brick, and though the entire area will be covered by the garage there will not be a post to obstruct the floor. The Maw Company, owners of the new garage, have just received a new 12-passenger sightseeing 'bus which will be put into active service immediately.

Increased Garage Facilities at Burlington, Vt.

BURLINGTON, Vt., Feb. 25.—Plans have been completed for the erection of a new building which will double the present car capacity of the Van Ness garage, in this city. When completed there will be accommodation for about twenty-seven cars. A feature of the garage which will be welcomed by tourists visiting Burlington will be the twelve-passenger Rapid sightseeing automobile recently purchased by Capt. E. P. Woodbury, of the garage. It will be used on excursion parties, and will also make regular trips to the wharf of the Champlain Transportation Company, on Lake Champlain, in place of the horse-drawn 'bus previously used. The Van Ness garage now has the agency for Western Vermont of the Rapid, the Reo, and the Premier cars.

GARAGE NOTES FROM ALL OVER.

Yakima, Wash.—The Yakima Garage and Automobile Company of North Yakima, Wash., has been incorporated, with a capital stock of \$5,000, by R. H. and A. F. Mitchell.

Houston, Tex.—On a recently purchased lot on Travis street, just above Texas avenue, Levy Brothers are building a brick structure designed as an automobile garage.

Ft. Dodge, Ia.—W. W. Eggers, formerly of Nora Springs, has signed a lease of the Crawford building on Public square, where he will open and operate an automobile garage.

Los Angeles, Cal.—A. J. Crawford has secured the contract to build a two-story brick building at the southwest corner of Main and Fifteenth street for George Wilson King. The lower story will be arranged for an automobile garage.

Philadelphia.—J. E. & A. L. Pennock, of this city, have just completed plans for a three-story and basement garage to be erected at 216-220 North Broad street. Construction will probably be undertaken as soon as the spring opens.

Canton, Ill.—James Duvall and A. M. Champ have just completed the purchase of a lot 40 by 80 feet on East Pine street, and will immediately begin work on the erection of a one-story garage building. This will be of brick, and will cover the entire lot.

Toledo, O.—Mirk Brothers have leased the ground floor of the building about to be erected on Jefferson street next to the Zenobia building, and will fit it up as a garage as soon as ready for occupancy. It has a frontage of 50 feet and a depth of 100. Construction has already been begun.

Wilmington, Del.—On April 1 the Wilmington Automobile Company, which now occupies half of a large building at Delaware avenue and Tenth street, will take possession of the re-

mainder of the building, thus more than doubling the present floor space. A new feature will be separate doors for entering and leaving the garage.

Chicago.—The automobile business is about to invade the residence district in Michigan avenue, south of Twenty-sixth street, Richard T. Crane having sold his large vacant holding in this block to purchasers who plan to erect upon it a five-story building for the purpose indicated. The proposed building will cost about \$100,000. The names of the purchasers are withheld.

Des Moines, Ia.—The garage of the Iowa Automobile Company is being entirely remodeled. The south twenty-two feet of the large room is being partitioned off for a retail sundries room. A new office will be built and the old one torn down. A new front will be put in and a new floor laid, and several of the center supports will be removed to give more room. New machinery is being added to the repair department.

Washington, D. C.—The corporation commission of Virginia has granted a charter to the Dupont Garage Company, of Alexandria, Va., which will conduct a general automobile business in Washington, D. C. The capital stock is to be not less than \$29,000 nor more than \$50,000. The officers and incorporators are as follows: W. S. Washburn, president; G. P. Sacks, vice-president; C. F. Sponsier, secretary; R. A. Klock, treasurer. The company has a large garage on M street, in Washington, and handles the Cleveland, Rambler and Orient.

Charleston, S. C.—The Army Cycle Manufacturing Company, the first concern to introduce gasoline cars in this section, is now planning to erect a modern garage adjoining its present establishment at 130-132 Meeting street. The building will be of brick, with cement floors, and will have a plate glass front. Included in its equipment will be a modern repair shop fitted out with machine tools of every kind needed for doing auto repair work. Among the recent sales made by this concern has been one of a four-cylinder Buick to the local fire chief.

■ MANY TOLEDO GARAGES AND AGENCIES.

TOLEDO, O., Feb. 25.—Local garages are getting in their stock of 1907 cars for prospective purchasers who are becoming more numerous every day. The Kirk Brothers have on hand a goodly number of Thomas Flyers at their Jefferson street garage, and incidentally it might be stated that before the season progresses very far this company will be installed in one of the finest garages in the city. C. S. Ashley is now starting the erection of a building on Jefferson street, between Tenth and Michigan streets, which is to be occupied by Kirk Brothers as a showroom. It will have a floor space of 50 by 100 feet.

Adjoining the site of the Kirk Brothers' new garage is located the Lichtie garage, which will continue to handle the Cadillac machines. To better display his automobiles, Mr. Lichtie has just had a large electric sign placed in front of his garage.

The Jackson machine will be introduced to Toledo buyers by the Rivers-Jacoby Automobile Company, which is located on Monroe street in the residence section. Along with the newcomer, the concern will handle the Rambler. Both stocks are well represented, but both are to be greatly increased as soon as the floor space of the company can be enlarged by an addition.

The Atwood Automobile Company, also located on Monroe street, will act as sales agents for the Elmore, Franklin, Pope-Waverley and Pope-Hartford cars during the coming season. The company has the largest garage in the city, being able to house 125 cars. Shipments of all these cars have been received.

The Central Automobile Company, on Ontario street, not far from Jefferson, will sell the Maxwell cars, a large consignment having just arrived. The company will also handle the Mitchell.

The Toledo Car Company, on Madison street, will act as sales agents for the Pope-Toledo cars and, with the home of the car in this city, the company ought to have something of an advantage over its rivals.

The new garage of the White Company, which the Spitzer Brothers are erecting for it at 1211-15 Madison avenue, will be open within a few days, and the White cars will be shown there.

ATLANTA HAS LARGEST SOUTHERN GARAGE.

ATLANTA, GA., Feb. 25.—There has been a considerable shake-up in the Atlanta automobile trade since the beginning of last season. The Atlanta Automobile Co., at that time a large concern, has been absorbed by the Capital City Automobile Co., a stock company backed by very considerable capital. This company has secured the old Peachtree Auditorium and fitted up the largest garage in the South. The cars carried by the Capital City Co. are the Stevens-Duryea, Peerless, Stearns, Franklin, White and Buick.

In addition to this corporation there are three other dealers—F. C. Steinhauer, 56 Edgwood avenue, who sells Thomas cars; James B. Todd, 322 Peachtree street, who handles the Stoddard-Dayton line, and John E. Smith, 122 Auburn avenue, who has the agency for the Reo line.

A "MOOSE" COLUMBIA DINNER AT HARTFORD.

HARTFORD, CONN., Feb. 28.—Sixty members of the office and factory force of the Electric Vehicle Company attended the annual moose dinner, the *picée de resistance* of which was supplied, as usual, by George E. Risley, of the sales department, who once a year travels to the wilds of Maine and returns therefrom with a moose. Three consecutive seasons has Mr. Risley been successful, and the third affair, held at Parson's Café, was the banner one of the series. Each course on the menu bore the name of some part or accessory of a motor car, and "Deacon" Henry A. Castle made a versatile toastmaster. Speeches and recitations were rendered by Messrs. Castle, Higgins, Hill, Bee, Wilson, Hathaway, Whitney, Nuckols, Fisher, Strout, and Risley, with songs sung by Messrs. McAneeny, Mertens and Hathaway. While the menu bore the caption of "All Speed Limits Removed," the autoists observed a reasonable pace and none was apprehended for scorching, or flooding his carbureter with alcohol.

DURYEA POWER COMPANY GOES UNDER.

What has long been predicted by the business-wise, if mechanically unlearned, has at last come to pass. Charles E. Duryea's persistent adherence to ideas that were beautiful theoretically and mechanically, but not practical from the point of view of the public demand, has brought him to financial ruin. How the company has managed to exist has long been a matter of wonder, so that its downfall is not wholly unexpected. It has always been hampered for lack of capital, and was finally compelled to go to the wall. The Pennsylvania Trust Company has been appointed receiver, and it is rumored that Herbert N. Sternbergh, of Reading, Pa., one of the stockholders, will buy in the plant and consolidate it with that of the Acme Motor Car Company, which he recently bought from the receiver of that concern.

BRISCOE MFG. CO. DENY UNAUTHORIZED RUMOR.

DETROIT, MICH., Feb. 25.—Owing to the statements which have been circulated among the trade that the Briscoe Manufacturing Company, of Detroit, Mich., intends to discontinue its radiator business, it has been found necessary to issue an official denial. The mistake probably arose from the fact that the company has discontinued the manufacture of galvanized ware, stoves, etc., this being rendered necessary in order to make room for the manufacture of radiators and other automobile parts. The Briscoe Manufacturing Company is now making plans for a larger business. In addition to the new brass foundry, a complete machine shop for automobile work has been opened.

BRIEF ITEMS OF NEWS AND TRADE MISCELLANY

John Duer, of Hastings, Neb., has disposed of his automobile business to C. L. Jones & Company, who will occupy the First street garage.

In the issue of *THE AUTOMOBILE* for January 31 the Holsman Automobile Company's machine was described as having "rope" drive. The company states that this should be "steel cable" drive.

The DAC Automobile Supply House controlled by Wyckoff, Church & Partridge, has changed its name to the W. C. P. Automobile Supply House, and Raymond H. Weaver, well known to the local trade, has been appointed manager.

John C. King, of Chicago, has ordered a 35-horsepower Fiat chassis to be fitted with a four-seated runabout body. He will take delivery of this car this month at Turin, Italy, and will spend the entire summer touring about Europe.

At a recent meeting of the D. C. Stover Company of Freeport, Ill., it was decided to change the name of the firm to the Stover Motor Car Company. For some time the engineers of the company have been busy on an engine for railroad and track inspection trips.

An order has been received by the Ajax-Grieb Rubber Company for 5,000 sets of tires for the well-known runabouts built by the Ford Motor Car Company. The tires will be shipped in pro rata lots during the next seven months. The Ajax people now occupy the three floors in the building at Broadway and Fifth-seventh street, with the factory at Trenton, N. J.

M. C. Hutto and Claude Nolan, of Jacksonville, Fla., have closed a deal with the Clark Auto & Launch Company whereby they become the sole owners of the plant, comprising fourteen second-hand automobiles, machinery, tires, tools, etc., and two new touring cars. This combined equipment will give the firm one of the most extensive repair shops and supply stores in the South.

While standing outside the Coliseum at Chicago at the end of the show week, the Stearns demonstration car was stolen. The automobile was a 30-60-horsepower model, bearing factory No. 202. It was painted with red sear panels, black under body and red running gear, and was equipped with a folding glass front. The F. B. Stearns Company would be glad to hear from any person having observed this car.

The limousine body building department of the Packard Motor Car Company, of Detroit, having completed its work of building the season's output of limousines for Packard "thirty" chassis, the company has decided to build a special lot of limousine bodies for summer delivery. These will be of standard Packard design and will be interchangeable with the touring body on either the Packard "twenty-four" or the "thirty."

One of the old landmarks of Main street, Buffalo, the Sheldon homestead, is to be removed to make room for a new automobile store for the Imperial Motor Company, of Buffalo, of which C. B. Penny is president. The building, which will be two stories in height, will have

a frontage from 1094-1100 Main street and a depth of 436 feet to Linwood avenue. A selling business only will be carried on, the building not to be used as a garage.

The Court of Common Pleas of Berks county, Pa., has entered a decree conveying to H. M. Sternbergh, of Reading, Pa., the entire property and assets of the Acme Motor Car Company of that city, terminating the receivership of D. J. Driscoll, which commenced in July, 1906. The price paid was \$66,000, and creditors will be paid in full therefrom by the receiver. Pending the organization of a new corporation the Acme Motor Car Company's business is continued without interruption by the purchaser.

A tester for the Wayne Automobile Company, of Detroit, Mich., who was discovered with the nose of his machine firmly planted against the factory wall, the high gear in and the rear wheels spinning merrily over the road, retains a rather unpleasant memory of the result of his inventive genius. He was trying to demonstrate to his own satisfaction the pulling powers of the engine and the staying qualities of the clutch. However, so pleased were the officials of the company with the idea that it was decided to submit every car to the test before shipping.

"Captain the Hon." William Stanley, noting the difficulty of beginners and others in the matter of speed-gear changing, set himself to design a device which would automatically and efficiently perform the work, remarks an English exchange by way of introductory to a description of the mechanism in question. It further describes a test of the device, which is said to work "charmingly" and in a most amazing and satisfactory manner. A car that will dispense with the services of a driver altogether should be next in order.

According to the figures which have been compiled at Albany by a Rochester automobile agent, 1,525 automobiles have been licensed in Rochester up to February 15. The automobile man was put to considerable expense to get the figures from the State records and believes the following numbers of the makes in use in that city to be authentic: Cadillacs, 107; Columbia electrics, 135; Wintons, 75; Packards, 59; Fords, 56; Franklins, 55; Pops (Pope-Toledo, Pope-Waverley, Pope-Hartford), 51; Olds, 48; Columbus electrics, 32; Bakers, 21; Jacksons, 13; Royals, 13.

NEW AGENCIES ESTABLISHED.

W. C. Jaynes & Company, 721 Main street, Buffalo, N. Y., have been appointed agents for the Royal.

The McDuffee Automobile Company, of Chicago, will very shortly move into the new branch salesrooms and garage in Milwaukee.

The George Lowe Company, 509 Tremont street, has taken the Boston agency for the American Mors, manufactured by the St. Louis Car Company.

The International Automobile Company, Montreal, is about to erect a \$40,-

000 garage on St. Catherine street and will represent in Canada the Dragon car, and for Eastern Canada the Wayne and Gale lines.

New agencies established by the Wayne Automobile Company are as follows: A. F. Solliday, Milwaukee, Wis., entire State of Wisconsin; Johnstown Automobile Company, Johnstown, Pa.; P. Pawler, Calumet, Mich.

W. W. Haskell has been appointed manager of the New York branch of the automobile oil department of the Alden Speare's Sons Company, of Boston. The New York branch of this firm is located at 654 West Thirty-fourth street.

Toronto, Can., has obtained a new automobile show room and garage, recently opened at 6 East Adelaide street by the Toronto Automobile Company. The new firm will handle all the well-known Pope models. W. R. Kicks is manager of the company.

Frank F. Weston, sales agent for the R. H. Smith Manufacturing Company, announces that his firm has leased the store, 1303 Michigan avenue, Chicago, to open a branch for the sale of the Springfield Motometer. W. L. Bowman will act as Western branch manager.

The Firestone Tire & Rubber Company will shortly open a Pittsburg branch at 5904 Penn avenue, East End, one square from the center of the "bunch." A complete stock of solid and pneumatic tires will be kept and a first-class tire repair shop will be installed.

A strong combination has been formed in New Jersey to handle the Lozier car in the eastern section of the State. Salesrooms have been opened at 17 Bank street, Newark, and it is proposed to establish branch headquarters in other localities. The members of the firm are C. Linkroum and L. W. Smelser.

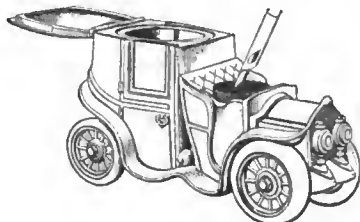
Automobile dealers in Indianapolis, Ind., are constantly adding to their agencies and more than twenty-five foreign lines will be represented in that city this season. The Indiana Automobile Company has just taken the State agency for the Pope-Hartford, Thomas, and Baker Electric lines; the Gibson Automobile Company has contracted for the agency of the Logan Construction Company and will make a specialty of one and two ton trucks.

OLD CARRIAGE FIRM ENTERS AUTO BUSINESS.

The Hume Carriage Company, one of the oldest firms engaged in the carriage industry, has opened an automobile department in connection with its works at Amesbury, Mass. A specialty is made of all styles of high-grade automobile tops in leather, twill or khaki. Repair work and do-over of automobile bodies will in future be an important branch. The company will carry automobile patent bumpers, patent foot rests which can be raised or lowered to fit any person, patent folding seats for limousine and touring cars, as well as a full line of headlights, searchlights and lamps of the best makes.

INFORMATION FOR AUTO USERS.

Auto Jewelry Novelties.—Automobile jewelry is one of the important lines handled by Chas. E. Miller, manufacturer, jobber, exporter and importer, of 97-101 Reade street, New York. The jewelry line is a branch of a large automobile supply trade, and includes such



AUTOMOBILE INKSTAND.

articles as charms, hatpins, and fobs copied from the automobile and automobile parts. The latest of these interesting novelties is the automobile inkstand, illustrated herewith. The top of the car opens, revealing an ink well. Other articles made from the same model are an ash receiver, match holder, jewelry case and pin cushion. All these are finished in a rich ormolu gold or French gray silver, and the length is 5 1-4 inches and height 3 1-8 inches. The price in either style is \$2 each.

The firm's 1907 catalogue has just been prepared, and can be had upon request.

Novel Lock Switch.—With the constantly increasing spread of knowledge of how to operate automobiles, and particularly in view of the strong temptation held out to the unscrupulous chauffeur out of work to make way with a car standing at the curb, a lock of some kind becomes an absolute necessity. And the great trouble with any form of lock requiring a key is that the owner him-



BRANDOW LOCK SWITCH.

self most often mislays the key and has to smash the lock. To remedy this and provide a simple and effective lock which is proof against anyone but the owner or employee with knowledge of its working, Dr. Frank W. Brandow, of Pittsfield, Mass., has devised a simple combination lock. But unlike the usual article of this

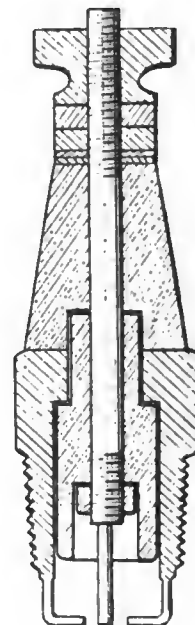
kind, there is no dial or number plate, the lock being operated solely by the sense of hearing or touch. It is a click lock and it is only necessary "to count the clicks." It may be operated by one, two or three numbers and an almost endless number of combinations are possible. One turn of the lever shown disconnects the batteries and a revolution of the dial advances the lock bolt, short-circuiting the magneto. The lock switch is enclosed in a neat hard-rubber case and lists at \$10.

A smart, attractive booklet has been issued by the A. W. Harris Oil Company, of Providence, R. I., dealing with their famed oils. Printed in yellow, black and red, the booklet is gotten up with considerable skill and is of a catchy nature. Le Blon, one of France's crack drivers, Barney Oldfield and F. E. Stanley, America's speeders, give their opinion on these oils, and the compiler of the booklet sets forth the different qualities of the firm's products and gives advice on the most suitable grades to use for different weather conditions and on various types of engines.

Merkel Motorcycle.—Numerous changes and improvements have been effected in the 1907 model of the Merkel motorcycle, manufactured by the Merkel Motor Company, Milwaukee, Wis. Wheelbase is six inches longer than formerly. The motor, 3 1-4 bore by 3 inch stroke, developing three horsepower, is set in an upright position and carried in the loop portion of the main frame tube. An entirely new float feed compensating carbureter, designed to give considerable variation of speed, has been utilized. Engine control is a grip device devoid of any angles or parts liable to wear loose or rattle. It is entirely inclosed in the inside of the handle bar, except that portion extending from the center portion of the main handle bar to the throttle lever of the carbureter. The Merkel type of suspension, so designed that it carries the weight of the rider entirely suspended on the springs housed within the rear stays, is retained as a feature of the new model. In addition a spring fork is now employed. A 1 1-4 inch flat, two-play belt is used, and the driving belt idler is so arranged that it can be adjusted while the machine is in operation and can be used in practically the same manner as

the clutch of an automobile to free the motor and allow it to run independently. The gasoline tank has a capacity for a 200 miles journey, while the lubricating supply is sufficient for 350 to 450 miles. An efficient muffler is provided, making the motor almost silent when under way.

Big 4 Spark Plug.—The spark plug put on the market by the Big 4 Spark Plug Company, 104 John Street, Detroit, is so named from the fact that it has four



CROSS SECTION BIG 4 SPARK PLUG.

electrodes, from which under all ordinary circumstances a flame is obtained from each point at one and the same time. Perfect insulation is obtained by the use of the best imported porcelain in two pieces, the front piece passing through the steel head, one-fourth inch, therefore giving no possible chance for the current to jump through from the central adjusting pin to the steel head. In this plug the large threaded bushing in the rear of the steel head, common to most plugs, is abolished. The steel pin, 3-16-inch in diameter, in the center of the plug, is that from which all adjusting and tightening is done. A special grade of wire is used for making the contacts, which has been proved by long tests not to corrode, scale or in any way break the spark.



1907 MODEL OF THE MERKEL MOTORCYCLE.

THE AUTOMOBILE



BOSTON, March 7.—And, finally, of the big shows comes Boston, with its Fifth Annual Automobile and Power Boat Exhibition, housed in spacious Mechanics Building and overflowing into Horticultural hall, and even then not having enough room for all comers. From Saturday night next to the following Saturday night the New England patrons of automobiles and motor boats will attend in thousands, and the allied industries will benefit to the extent of thousands of dollars in sales.

"Bigger, Better, Busier Boston" was the slogan that landed Boston's energetic mayor, John F. Fitzgerald, in the coveted place in City Hall, and since the campaign his alliterative war-cry has become almost indelibly associated with the commercial activities of the Hub. The phrase cannot be applied with greater truth than to this fifth show of the Boston Automobile Dealers' Association. Each one of the adjectives by itself, or the three as a unit, describe the collection of motor vehicles for land, and power craft for sea that has been assembled for the edification of New Englanders next week fully and completely.

That the Boston show is "Bigger" than any of its historic or immediate predecessors, here or elsewhere, needs only a brief and cursory examination of the halls to prove. Every foot, every inch even, of the exhibition space in the great halls of Mechanics Building, the largest of its kind in New England, and of Horticultural Hall, has been sold. Late comers who, though they moved heaven and earth, could not buy or beg floor space have had to be content to show their products on the side walls or in the aisles. And they consider themselves lucky to be a part of the biggest automobile show of the country. The automobiles have even invaded the precincts of Paul Revere Hall in Mechanics Building, a handsome apartment whose polished floor is rarely revealed except for dancing purposes. That this hall might be used required several special meetings of the trustees

of the buildings, and the bringing to bear of every possible influence by one of the oldest and largest automobile concerns in the country, which, through misunderstandings, had been shut out from obtaining space on the main floor. Up the avenue in Horticultural Hall the huge motor trucks look strange in the halls where the Boston public is accustomed to view rare orchids, roses and the other products of the best greenhouses of the State. More different makes of automobiles will be on exhibition at the Boston show than at either of the New York exhibits, and nearly, if not quite, as many as at the two combined.

That the show is "Better" than ever before cannot fail to be the verdict of the host of enthusiasts when it is admitted to the apple orchard and rose garden into which Manager Campbell has transformed the show buildings. Not only is the idea of the decorations unique, but it is effective, and the orchard in full bloom and the trellises loaded with roses, sheltering the mechanical masterpieces of the 1907 product of the automobile factories, cannot but delight the New Englanders who have been so badly buffeted about by the raw North winds this exceptionally cold and severe Winter. It will be like a jump forward of two months into the springtime atmosphere of early May. But it is not alone in its decorative features that the Boston show claims superiority. Its main claim rests on the fact that here, and only here, in the eastern half of the United States, can the season's progress in automobile construction be observed and studied at one time, in one place and without distinction between exhibitors. Selden licensees of years' standing, and the youngest comer from some local machine shop are aligned side by side and invite comparison. It is the boast of the management that nowhere east of Chicago is there so thoroughly representative an exhibition of motor vehicles as that which has been arranged for the delectation of New England people.





When it comes to the third adjective, "Busier," evidence, in its nature circumstantial, must be relied upon to prove the case, for it will not be until the end of the show, when the exhibitors have had a chance to figure results, that the business will be definitely known. But circumstantial evidence is often stronger than direct, and all that at hand points to the Boston show as a record breaker in point of attendance and sales. Since the 1907 models made their appearance three months ago, the local dealers have been conducting a strenuous campaign, and many are the buyers whose appetites for motoring have been whetted by the accounts of shows in other cities and by demonstrations in Boston, and who have been brought to the point where they just want "to look 'em over" once more before signing the order and making the deposit. There are so many of these that all the previous records of the Boston show for business are likely to go by the board. Another thing that has always made the Boston show noted for its sales, is that the spring riding season is only a few weeks away, and even the most inexperienced know that if they wait any longer the 1908 models will be out before they have a chance to ride in their 1907 cars.

Why the Boston Show Is Held in the Spring.

It has often been said, particularly within the past year, that the Boston show ought to be earlier in the season, and the change has been advocated to some extent. It is claimed that the show now comes in the midst of the selling season and interrupts business for a couple of weeks just when the dealers need their time for giving attention to customers. It is also claimed that being so late it keeps purchasers from placing their orders and makes deliveries late. This argument, of course, has some weight, but the great fact remains that in Boston and at the Boston show the dealers come in contact with the purchasers, instead of the factories with agents. It is in no way an agent's show, though more or less agency work is done. It is a show that is retail rather than wholesale in its character; and, therefore, its closeness to the open riding season is an advantage, for purchasers do not want to put up their money or receive their car any earlier than necessary before they desire to make use of it.

At the opening of the show this year it is planned to have some little ceremony. The Boston management cannot get the diplomatic corps from Washington to grace the affair, and it has not invited the President, but it will have some of the prominent men in the automobile line on hand for the preliminary opening. Nothing elaborate will be attempted, but there will be a select few who will get a glimpse of the apple orchard before the great Saturday night crowd is admitted. This is an innovation, as heretofore the doors have been thrown open to all at the appointed hour and when the thousands got ready to leave the building it required all day Sunday to put it in presentable condition for the real interested parties who make it a point to stay away from the opening night. The real opening will take place at 8 o'clock Saturday evening, but beginning Monday the doors will be open from 10 o'clock in the forenoon until 10 o'clock at night. One ticket will admit to all departments of the show.

STATISTICS THAT TELL OF ITS BIGNESS.

According to Manager Chester I. Campbell, the following statistics illustrate how great will be Boston's fifth show. The Paris Salon figures somewhat spoil the leadership in the accompanying statistics, and so nothing is said of the French affair.

The Number of Exhibitors.

A. C. A. Show, Grand Central Palace, New York, December, 1906	230
A. L. A. M. Show, Madison Square Garden, New York, January, 1907	249
Chicago Show, Coliseum, February, 1907	270
London Show, Olympia, December, 1906	290
Boston Show, March, 1907	342

Individual Makes of Automobiles.

A. C. A. Show, Grand Central Palace, New York, December, 1906	85
A. L. A. M. Show, Madison Square Garden, New York, January, 1907	45
Chicago Show, Coliseum, February, 1907	96
Boston Show, March, 1907	121

Total Number of Cars Exhibited.

A. C. A. Show, Grand Central Palace, New York, December, 1906	251
A. L. A. M. Show, Madison Square Garden, New York, January, 1907	238
Chicago Show, Coliseum, February, 1907	359
Boston Show, March, 1907	423

NEW CARS AT THE BOSTON SHOW.

Though the closing event of the show season held at the Hub has always been productive of novelties in the shape of new entrants into the field of automobile builders, this has seldom, if ever, been the case to the same extent as will mark this year's show. Gasoline, steam and electric cars are all represented. No less than eight of the first-named type will make their debut.

These are the Bay State Forty, Bay State Automobile Company; the Bailey, Bailey Automobile Company; the Aurora, Brown Motor Car Company; the Gearless, two-cycle and four-cycle, Gearless Transmission Company; the Holmes, Holmes Motor Vehicle Company; the Heyman, Edward Heyman; the Mason, Puritan Motor Co.; and the Broubot, K. A. Skinner.

The Clark steamer, built by Edward S. Clark, is the sole new representative to appear in this class, while in the electric field there are the Bailey, S. R. Bailey & Company, Inc.; and the Boston, made by the Concord Motor Car Company.

A SHOW LAUNCH WITH FEATURES.

One of the Maine exhibitors will show in the boat department a launch built expressly for a young woman who has attained a wide reputation as a daring racer of motor boats. The launch is built on very graceful lines, of approved design, and has many noticeable features, one particularly, which the women will admire, is the enclosed engine, as no motor is in sight, and all danger of a woman's skirt becoming entangled in the moving parts of the machinery is eliminated.



WHY THE BOSTON SHOW IS A NECESSITY

WITH the rapid spread of the automobile show idea throughout the country, until every city where there are a few agencies, is clamoring for a show and the agents are asking the manufacturers to help them out by supplying show cars, it is no wonder that the manufacturers are much disturbed at the prospect, and look with favor on the suggestion to limit the number of shows to the so-called national exhibitions in New York and Chicago. Boston representatives who have been called upon by their agents in other New England cities to supply cars and help out at the local shows can sympathize with the manufacturers to a certain extent, for these small shows require very much time and do not yield an adequate return. When it comes to a suggestion that the Boston show be eliminated, the Boston and New England dealers, however, are at once in arms, for they believe that the annual Boston show is as necessary from an industrial standpoint as are the New York and Chicago shows. New England people, they argue, cannot be forced to go to New York to select their cars, especially when, in order to see all the machines, two trips would be necessary. Furthermore, the Boston show has always been a big seller, and as a means of arousing enthusiasm for automobiling and as an agent of publicity is unequaled.

There is, however, among the Boston dealers, a feeling that while it is better to have the Boston show in the late rather than the early Winter, as it is in effect a retail show, business being done between agents and owners, rather than between manufacturers and agents, it might be a good plan to advance the date a few weeks so as to bring the show into February, having it come a little nearer after the Chicago show. The middle of March as a show time is a little too late, for it comes just in the midst of the selling season, and tends to delay orders, and in consequence make deliveries late. The movement for an earlier show has not taken definite form just yet, but there is a possibility that when the Dealers' Association gets ready to make its preliminary plans for the 1908 show, it may decide to have it in February instead of March.

As the Manager of the Shows Looks at It.

Speaking of the place in the industry occupied by the Boston show, Chester I. Campbell, who has managed the Boston show for the past three or four years, said:

"The Boston show is entirely different from the national shows in New York, but has as important bearing on the industry in its way as the earlier exhibitions. The Boston show is not for the purpose of giving the manufacturers a chance to show their agents the new product and to place new agencies, nor is it to give the agents an opportunity to become familiar with the cars for the coming season. On the contrary, our show is to instruct individuals and prospective owners. It is essentially a retail show, so to speak; it comes too late for agency business. The people who have made up their minds just what car they want may buy earlier, but there is always a great host that is undecided, and the Boston show creates enthusiasm among these. We have considered the question of holding the show earlier in the season, and while there is some feeling among the members of the Automobile Dealers' Association in favor of an earlier show, I do not think that the majority would want it much earlier than at present. It might be advisable to move back the date to the middle of February, providing we could secure the halls for that time, but no earlier. Even in February there would be less chance for demonstrations, which are an important part of a show held primarily for those who are going to buy cars for their own use and drive them. The importance of the Boston show from an industrial standpoint is best demonstrated by past results. Sales have always been very large and the attendance remarkable, while in point of space the Boston show is the largest in the country. We have already received sixty applications for

space in the 1908 show and it is not at all improbable that we will have to separate the motor boat show in another year in order that there may be sufficient space for the growing number of automobiles."

According to the Treasurer of the Association.

Harry Fosdick, who has been an automobile dealer in Boston ever since the trade was concentrated in two or three types of steam buggies, and who is now treasurer of the Dealers' Association, is enthusiastic over the advantages of the Boston show.

"The manufacturers may call our show local, but it is as much national in effect as the Chicago show. If the show were omitted the manufacturers would hurt themselves as much as the local dealers, for the New England trade is a large one and important. Boston and New England people do business different from the way it is done in New York. In that city sales are made quickly; here the buyer wants to investigate thoroughly and be sure of what he is getting before he pays his money. He doesn't buy on the spur of the moment and therefore doesn't like to buy in New York. Besides, New England people take an interest in things in Boston and will come here from Maine, Vermont and New Hampshire; Boston sets the style, so to speak. Some Boston people go over to New York, but they go to get ideas, and don't buy there to any extent. Our show might be a little earlier, perhaps, but it occupies a peculiar place in the industry; it is a place where actual business is done and as such does not need to be so early as the shows where the larger part of the sales are by the manufacturers to their agents."

From the President of the Association.

J. H. MacAlman, president of the Dealers' Association, when asked for his opinion concerning the industrial importance of the Boston show, said:

"The anxiety of the manufacturers to secure space in our show and its growth in the past two or three years are proof enough, if any is needed, of the high place the Boston show holds in the estimation of the manufacturers. We are absolutely unable to accommodate all who have applied to us for exhibition space this year. Boston is one of the largest automobile centers in the country and Boston people demand an exhibition where they can see all the cars before deciding which they will buy. The Boston show is a retail exhibition for New England. The New York shows come at a time when all the cars are not ready and the product that is shown is more in the nature of machine shop cars. The cars at the Boston show, on the other hand, are the manufactured product ready for delivery from the floor. The attendance and sales of the past shows indicate clearly that Boston people are ready and willing to support a show and are anxious to see the cars."

The Opinion of the Vice-President.

George H. Lowe, vice-president of the Dealers' Association, has been in the New England trade since the automobile made its first appearance, and he has had more or less to do with Boston show promoting since it began. He commented in this vein:

"To my way of thinking, the Boston show is an absolute necessity to the automobile trade of New England. There are many down Easters who have neither the time nor the money to make the long trip to New York, but they desire to look over all the cars, even though they select a later model of the cars which they might be driving. In point of immediate results, it is pretty safe to say that the Boston show results in the sale of more cars than any other exhibition held in the country. People certainly come to the Boston Show for the purpose of buying, and in the majority of cases the experienced expositors see to it that they do not go away empty-handed. And New Englanders are cautious buyers."

HISTORY OF BOSTON AUTOMOBILE SHOWS

IT is so long since Boston had an unsuccessful automobile show that most of the people who crowd their way into the big Mechanics Building this year will probably have forgotten all about it. Some of them will recall that the big shows previous to last year were given in Symphony Hall, farther up the avenue; but they will remember the Symphony Hall shows merely as good displays that proved tremendously popular with the show-going public and automobile enthusiasts of all sorts.

The fact is, automobile shows in Boston beginning with that of 1903 have been remarkably successful. They have needed no apologies, even on the score of lateness in opening, for the Boston public has shown itself perfectly ready to wait until March for a look at the local offerings, regardless of the fact that new models have usually been seen and discussed pretty generally at the big shows in New York and Chicago, earlier in the year.

One new thing about the show in Boston this year is the organization back of it. Since last year's exhibition a reorganization has been effected, and this year's show is given under the auspices of the Boston Automobile Dealers' Association, Incorporated, instead of the Boston Automobile Dealers' Association.

But to get back to the last unsuccessful show: It was in Mechanics Building, in 1903. It failed of success because of a split between the local automobile clubmen and the dealers. All hands started early in the winter to work together for a show; but when it developed that each faction wanted to be the guiding influence, the parties separated. The clubmen, organizing what was known as the New England Automobile Association, gave a show in the main hall of Mechanics Building in February, at the same time that the New England Kennel Club's dog show occupied Exhibition hall, in the same building. But most of the dealers held back their cars for the dealers' show, which was then planned for Symphony Hall in March; and the result was a meagre display of vehicles at the club show, and the substitution of "stunts" on the broad floor instead of an exhibition of new-model autos.

The show of the dealers, in March, proved doubly successful on account of the fiasco in February; the gate receipts were in excess of the dealers' wildest anticipations, and dealers and public were alike gratified. Another successful show was given in Symphony Hall in 1904; but thereafter more room was imperative, and the dealers moved down to Mechanics Building in 1905, taking the whole building with such success that they have continued there until the present season, with a show each March. Meanwhile, certain dealers had a rival show in Symphony

Hall in show week of 1905, and last year Symphony Hall was used in the show week for an exhibition composed largely of imported cars—virtually an overflow exhibit of cars crowded out of Mechanics Building. Horticultural Hall has been used each year for a power boat show, except last year, when the power boats were in the basement of Mechanics Building.

Early automobile shows in Boston were always in conjunction with some other and larger exhibition. The first was an adjunct to the Mechanics Fair, so-called, or customary exhibition of the Massachusetts Charitable Mechanics Association, in Mechanics Building. It was given in November, 1898, and while the main floors of the building were occupied as usual in the Mechanics Fair by all sorts of machinery, a section of the basement was given especially to automobiles. This section was visited by many persons interested in the automobile as a novelty, but it attracted little popular notice. The Charitable Mechanic Association, however, did much to stimulate interest among inventors of that day by offering \$1,100 in prizes for automobile events given one afternoon during show week at the Charles River Bicycle Park, near the Cambridge end of the Harvard Bridge.

Subsequent automobile shows in Boston were merely small displays in connection with industrial shows or food fairs until 1901. In that year a company of professional show promoters came to town prepared to run a big automobile exhibition and reap a harvest. They engaged Mechanics Hall; but they charged such amounts for floor space that comparatively few manufacturers or dealers cared to bid for popular favor through their show, and as a result the exhibition was a fizzle. The public did not attend in large numbers and those who went saw comparatively few machines.

Partly to overcome the ill effect of this show on the public mind, the dealers and the members of the newly-formed automobile club in 1902 joined with the promoters of a big fair that was to be held in Mechanics Building, and arranged for an automobile section. All hands, dealers, clubmen and users of commercial vehicles, joined to make this exhibit a good one; and for a small show it was a pretty good success. One of its interesting features was a street parade, starting from the Mechanics Building and touring the business and financial districts in mid-forenoon. The 1902 show was the first to convince the public that steam, gasoline and electric cars were all being developed successfully; and it paved the way to the enlarged public interest that has been in evidence at all shows since that year.



BOSTON'S 1906 SHOW OPENED WITH IDEAL WEATHER.



LATER A SNOWSTORM MADE DEMONSTRATIONS DIFFICULT.

THE EXHIBITORS OF THE 1907 BOSTON SHOW

THOSE WHO WILL SHOW GASOLINE CARS.

Exhibitor.	Exhibit.	Space.	Exhibitor.	Exhibit.	Space.
Butler Motor Car Company	Pierce Racine.....	1	Jenkins, W. M. & Company	Mitchell	24
Butler Motor Car Company	Cleveland	1	Jeffery, Thos. B. & Company	Rambler	53, 54
Butler Motor Car Company	Rapid	1			
Butler Motor Car Company	Rapid Commercial.....	304, 805	Kimball, E. T., Company	Corbin	44, 45
Boston Automobile Exchange	Crawford	12	Knox Motor Truck Company	Atlas	306
Bay State Auto Company	Bay State Forty.....	69			
Bay State Auto Company	Queen	241, 244	Lowe, Geo. H., Company	Aerocar	11
Boston Motor Company	Pungs-Finch	91	Locomobile Company of America	Locomobile	73, 74
Boston Motor Company	Acme	92	Linacott Motor Company	Wayne	100, 101
Buck & Price Company	Rainier	93	Linscott Motor Company	National	102, 103
Bond Bros. Company	Deere	99	Linscott Motor Company	Reo	104
Berkshire Auto Company	Jackson	106	Litchfield, Everett S.	Austin	109
Blake, E. P., Company	Logan	107			
Blake, E. P., Company	Berkshire.....	110	Maguire, J. W., Company	Pierce Great Arrow.....	14, 13
Blake, E. P., Company	Logan Truck.....	318	Mills-Kennedy Company	Weich	23
Blake, E. P., Company	Logan Light Delivery Wagon.....	318	Mills-Kennedy Company	Springfield	23
Bailey Automobile Company	Bailey	311	Matheson Motor Car Company	Matheson	25, 26
Brown, George M.	Apperson.....	330, 331	Maxwell-Briscoe-Boston Co.	Maxwell	63, 64, 61
			Morrison, A. E., Company	Stearns	67
			Morrison, A. E., Company	Oldsmobile	68
			Moore, Alfred Cutler, Agent	Panhard	94
			Metropolitan Automobile Co.	Moon	810
			Napier Motor Co. of America	Napier	55
			Northern Auto Agency	Pennsylvania	76
			Northern Auto Agency	Pullman	76
			Northern Auto Agency	Northern	76
			Nichols, D. P., & Company	Frayer-Miller	222, 223
			Prentiss Motor Car Company	Studebaker	15
			Park Square Auto Station	Berliet	41
			Peerless Motor Car Company	Peerless	70, 71
			Panhard & Levassor Auto Co.	Panhard	94
			Parker, F. R., & Company	Elmore	113
			Puritan Motor Company	Dolson	307
			Puritan Motor Company	Mason	307
			Reed-Underhill Company	Knox	6, 10
			Randall, Frederick E.	Stevens Duryea.....	20, 21, 22
			Royal Automobile Company	St. Louis.....	73
			Reed-Underhill Company	Knox Truck.....	300
			Reliance Motor Car Co. Agency	Reliance	309
			Smith, Fred S.	Autocar	16
			Stratton, H. C., & Company	American Mercedes.....	16
			Stratton, H. C., & Company	De Luxe	49
			Stratton, H. C., & Company	Klesler-Kar	46
			Squirer, Geo. C.	Premier	75
			Sturtevant Mill Company	Sturtevant	77
			Stranahan-Eldridge Company	Bulck	85, 86, 87
			Skinner, K. A.	De Dion Bouton.....	202
			Skinner, K. A.	Brouhot	302
			Shawmut Motor Company	Shawmut	112
			Sumner, B. D.	Commercial Truck.....	303a
			Winton Motor Carriage Co.	Winton	4, 3
			Whiting, H. E., Automobile Co.	Mora	39
			Whitney, C. F.	Stoddard-Dayton	40
			Wing, Frank E.	Marmor	50, 51
			Waltham Manufacturing Co.	Waltham-Orient	82

STEAM CARS AND THEIR SPONSORS.

Boston Auto Livery	Ambulance	105	Stanley Motor Carriage Co.	Stanley	2
Clark, Edw. S.	Clark	84	White Sewing Machine Co.	White	5, 9
Ross, Louis S.	Ross	47			

ELECTRICS HAVE THE FLOOR AT THESE STANDS.

Babcock Electric Carriage Co.	Babcock	43	Prentiss Motor Car & Supply Company	Studebaker	15, 312
Bailey S. R. & Company, Inc.	Bailey	117a	Rauch & Lang Carriage Co., The	Rauch-Lang	115
Columbia Motor Vehicle Co.	Columbia	62	Sumner, B. D.	Commercial Trucks.....	303a
Fosdick, Harry, Company	Baker	56	Concord Motor Car Company	Boston	90
Henshaw Motor Car Company	Columbus	80			

MAKERS AND DEALERS IN MOTOR BOATS, ENGINES, AND ACCESSORIES.

Exhibitor.	Space.	Exhibitor.	Space.	Exhibitor.	Space.	Exhibitor.	Space.
Asro & Marine Motor Co.....	260	Detroit Engine Works.....	242	Jager, Charles J., Co.....	274	Racine Boat Mfg. Co.....	210, 211
American Gas Motor Co.....	266a	Detroit Boat Co.....	243	Lamb Boat & Engine Co.....	261	Richardson Engineering Co.....	250a
Atlantic Co., The.....	198, 199, 200, 201	Davis, F. E.....	283	Metropolitan Canoe Co.....	212	Rathburn-Lacy Co.....	265b
				Manufacturing Equipment & Engineering Co.....	232		
Buffalo Gasoline Motor Co.....	219	Emerson, Joseph B.....	212	Morse, A. S., Co.....	236, 237	Stamford Motor Co.....	266a
Boynnton's Imp. Oil Clothing Co.....	250b	Emmons, E. Gerry, Corp.....	231	Michigan Steel Boat Co.....	239	Stuart-Howland Co.....	251
Brownell-Trebert Co.....	254a	Electro Radiation Co.....	254c	Moore, C. Frank.....	256	Stanley, The, Co.....	264
Bridgeport Motor Co.....	254b	Emery, V. J.....	268	Murray & Tregurtha Co.....	257, 301, 302	Small Brothers.....	261
Broadhead, W. H. & Co.....	259	Essex, The, Engine Co.....	285	McLellan, Chas. P.....	207	Sterling Engine Co.....	266
Bath Marine Construct'n Co.....	275	Fay & Bowen Engine Co.....	206	Michigan Wheel Co.....	288	Sterling Mfg. Co.....	267
Briggs & Wade.....	281	Forbes, Walter J.....	258, 265	McLellan, Chas. P.....	207	Standard Engine Co.....	252
Binney, Arthur.....	282	Fairbanks, The, Co.....	276, 277	Norfolk Motor Co.....	210a	Stuart, John, Co.....	264a, 273a
Burgess, Hollis, Agt.....	306a	Ferro Mach. & Fdy. Co.....	289	Norton Company.....	234		
		Gray Motor Co.....	256	Poyen, John S.....	196, 197	Termaat & Monahan Engine Co.....	252
		Gulliford, Geo. A.....	262	Progressive Mfg. Co.....	203, 204	Toppa Boat Mfg. Co.....	269, 270
		Hanna Machinery Co.....	326	Poole & Price Mach. Co.....	210a	Terry, Geo. H., Co.....	261
		Holmes, The, Motor Co.....	230	Palmer Brothers.....	253	Tuttle, D. M., Co.....	265a
		Hodgson, E. S.....	263	Plug Umbrella Co.....	266b	Truecott Boat Mfg. Co.....	271
		Harvard Marine & Auto Co.....	284	Perkins Launch & Motor Co.....	291a		
		Hurd, A. W.....	292			Wells, A. E. & Son.....	286
		Ideal Gas Engine Co.....	268a			Western Launch & Engine Works	290

EXHIBITORS OF AUTOMOBILE ACCESSORIES.

Table listing exhibitors of automobile accessories with their names and addresses. Includes companies like Auto Goods Company, Atlas Manufacturing Co., and various tire and electrical suppliers.

PUBLICATIONS REPRESENTED AT THE SHOW.

Table listing publications represented at the show, including Automobile, Boston Transcript, Boston Herald, and various regional newspapers and journals.

TO TAX AUTOISTS FOR ROADS BUILDING?

NEW HAVEN, CONN., March 3.—A bill for the bonding of the State for a large sum for the building of a comprehensive system of highways is now before the Connecticut legislative committee on roads, bridges and rivers.

Representative Charles G. Allerton, of Middlebury, Conn., house chairman of the committee on roads, bridges and rivers, is in favor of a bill taxing all automobiles in the State.

"The bonding of the State, say for \$5,000,000, to meet the expense of building an efficient system of highways would entail practically no burden on the people of the State and the result would be of inestimable benefit to rural communities.

"There is now, I learn, 400,000 horsepower in automobiles in use in this State. If a tax of say 50 cents a horsepower were levied on the owners, \$200,000 a year could be raised which would pay the interest on \$5,000,000 worth of bonds.

Mr. Allerton, being a successful farmer in Middlebury, thoroughly appreciates the value in facilitating the marketing of farm products by good highways.

GOVERNMENT DOING LITTLE FOR ROADS.

WASHINGTON, D. C., March 2.—Logan W. Page, director of the Office of Public Roads, recently appeared before the Committee on Expenditures in the Agricultural Department and gave the members considerable information about the work being done by his bureau.

Director Page informed the committee that he and his staff must get means for meeting this problem, and they are making experiments with every known material that they thought will accomplish the desired end.

STATUS OF THE AUTOMOBILE IN NEW ENGLAND

By C. F. MARDEN.

NEW ENGLAND is recognized by automobilists everywhere as one of the best touring districts in the country; if any proof were necessary it could be found in the fact that the last two contests for the Glidden trophy, the great national touring event, have entered New England. The district has better roads than can be found in any other six States in the Union; it is better equipped with hotel facilities, and automobilists are treated better than in most other places. In addition to this are its great natural advantages. It is difficult to find a more pleasant destination for a tour than the White Mountains, which have come to be very popular with automobile owners in the past two or three years, due partly, perhaps, to the hospitality of the hotelkeepers and their efforts to make things interesting.

It is no wonder, then, that automobiling in New England has made such giant strides forward. It is conservatively estimated that there are registered in the six States in New England nearly 30,000 cars. If this is a correct estimate, then New England has nearly 20 per cent. of all the cars registered in the States which have registration laws. According to the latest statistics available, there were 26,377 automobiles registered in the New England States. Massachusetts was in the lead with 17,299, Connecticut second with 3,900, Rhode Island third with 1,714, Maine fourth with 1,364, New Hampshire fifth with 1,253, and Vermont last with 847. These figures were made up some time ago, so that it is likely that a total of 30,000 cars in the six States is nearer correct at the present time.

In the organization of automobilists also New England is well to the fore, and few States can boast as many clubs as there are in these States. Massachusetts alone has not less than half a dozen well organized clubs. Among these are the Massachusetts Automobile Club, Bay State Automobile Association, North Shore Automobile Club, Worcester Automobile Club, Fitchburg Automobile Club, Springfield Automobile Club, and others of lesser importance. Maine has a club at Portland, New Hampshire a flourishing organization at Manchester, Rhode Island the Rhode Island Automobile Club, and Connecticut several organizations in the larger cities.

Though there seems to be a tendency to swing the national

competitive events away from New England in 1907 to satisfy the clamoring of the growing West, New England has always been prominent in these affairs, being represented by several citizens in touring contests ever since the famous Pittsburg mud run. New Englanders were prominent in the first Glidden tour from New York to the White Mountains and return, and in the tour last summer from Buffalo to the same destination.

In racing, too, New England has set the style. One of the first race meetings in the country was that at Newport, when William K. Vanderbilt, Jr.'s *Red Devil*, John Jacob Astor's steamer, Kenneth Skinner's motor tricycle and an electric car were the contestants in the free-for-all that was the final event on the programme of the races on the half-mile Aquidneck Park dirt track. Few more successful track meetings have been held anywhere than those at the Peadville track, near Boston.

It is as a manufacturing center alone that New England has to give place to other sections of the country. Less favored by proximity to the sources of supply, by labor and by transportation conditions, than some of the States of the Central West, the manufacturing of automobiles has not grown as fast here as in other places. Yet some of the best known cars in America come from the six States in the northeast corner of the United States. Such cars as the Columbia, the Pope-Hartford, the Locomobile, the Knox, the Stevens-Duryea and the Napier are manufactured in New England, and in a summary of production the output of these factories would give New England a not inconspicuous place in the industry.

As a selling community New England is one of the best, standing second only to New York, and its possibilities have as yet not been fully developed. Boston has been exploited to a considerable extent and probably has more automobiles per capita than most of the larger cities, but there is a large territory in Maine, New Hampshire and Vermont that is only now being opened up. Boston dealers are reaching out into these States, establishing agencies and preparing for a campaign which, during the next year, is likely to largely increase the number of cars in use in these States. The future of the industry has no more promising field than the above territory.



INDICATIONS OF EARLY SPRING IN NEW ENGLAND.—A CORBIN UPON A MODEL CONNECTICUT HIGHWAY.

THE FLOURISHING AUTOMOBILE CLUBS OF BOSTON

CLUB life of Boston automobilists has had two periods of almost kaleidoscopic change. The earliest was in the days when the possibility of getting motorists enough together to carry on a respectable organization first made itself evident. The second was within the last three years after the big local shows had stimulated enthusiasm.

The club idea first spread to Boston in 1900. It came as a unit, but it found two factions of automobile enthusiasts waiting to appropriate it. One wanted to turn it to the building of a comfortable clubhouse in the country; the other saw no sense in any kind of a club unless it established an "automobile stable," as they called it in those days, in the midst of the city. The first aggregation developed into the old New England Automobile Club; the other organized the old Massachusetts Automobile Club.

They were rivals in about everything, at the start. The New England got in first with its organization—October 8, 1900—but was not incorporated until January 11 following; whereas the Massachusetts had the foresight to organize as a corporation at the start, thus antedating the other on the official records with a charter dated October 31, 1900. The Massachusetts had J. Ransom Bridge for president, Conrad J. Ructer for treasurer, and L. E. Knott for secretary. The New England's leaders were Arthur W. Stedman as president, Francis R. Hart as vice-president, George McQuesten as secretary, and Royal R. Sheldon as treasurer. The Massachusetts had on its original Board of Governors, Capt. Homer W. Hedge, John Brisben Walker, Jr., Ernest Rueter, Dr. W. A. Rolfe, and others; while the New England's executive committee included such enthusiasts as F. E. Stanley, Knight Neftel, Henry Howard and C. L. Edgar.

Both organizations were keen after a clubhouse, but the New England, composed very largely of members of the Country Club of Brookline, managed very soon to get control of the house and grounds of old Suburban Club, a driving club, in the heart of Brookline just across the road from the Country Club park; and with a housewarming here on February 22, 1901, the New England inaugurated a brief but active career. Its activity was largely confined to the ensuing season, when it had the distinction of running the first automobile race meet ever attempted east of New York, and on June 16, the day after this meet, had the first big club run, which was from Brookline to Marblehead and return. The race meet took place on the Country Club half-mile oval track.

The Massachusetts club had the biggest club run ever held in this State, so far as mere stringing out of vehicles is concerned, on June 17, when the club got together automobiles and their owners from all parts of the district and ran from Boston to Sharon. What a string of sixty or seventy autos can do in the way of raising a dust on a hot June day was shown so conclusively at that time that nobody in Boston has ever attempted that kind of a club run since.

The Massachusetts Automobile Club.

Events of that summer, however, showed that while the two clubs might own to slightly different ideals, their objects were in fact about the same; and in the fall they got together, buried the hatchet, and formed a new organization under the name of the Massachusetts Automobile Club, with Col. James T. Soutter as president, Elliot C. Lee as vice-president, Dr. J. C. Stedman as second vice-president, Royal R. Sheldon as treasurer, Dr. F. L. D. Rust as secretary, and A. W. Stedman, C. J. Glidden, George McQuesten, Henry Howard, J. R. Bridge, Newton Crane, Dr. W. A. Rolfe and Ernest Reuter as directors. Plans for a city clubhouse were at once drawn up; the building was pushed to completion; and on the evening of January 1, 1902, there was a splendid housewarming. This clubhouse is on Boylston street, with garage on the first floor and basement; club parlors, billiard

rooms, and dining-rooms on the second floor; and repair rooms on the third floor. As a convenient place for storing cars the club has always been prosperous, and this feature of its activity increased so rapidly after the first year that in 1904 the three-story brick building on Boylston street was enlarged to three times its original size, and provisions made for caring for a largely increased number of automobiles.

Flourishing Life of the Bay Staters.

The Bay State Automobile Association came into being in January, 1905, with the idea of benefitting all users of motor vehicles with merely nominal expense to individual members. The social features of automobile ownership were to be kept well to the fore, yet it was also intended to foster the good roads movement, to give conservative protection against drastic legislation, and to work for rational rules and regulations governing the use of all classes of cars.

The first headquarters were a pleasant and convenient suite of rooms on the ground floor of the Hotel Lenox, about a minute's walk toward Copley square from the house of the Massachusetts Automobile Club. But as the season developed, the club members began to interest themselves in club runs and racing plans; they became eager for a house in the country. They had successful race meets at Readville that first year, with club runs to Rye Beach and other places. On December 1 the association took possession of what was known as the Annex of the old Woodland Park Hotel, at Auburndale; and in those quarters they enjoyed all the comforts of a well-equipped clubhouse, with the hotel to supply the dining room. Many meetings, dinners and smokers were enjoyed there; and the annual meeting was turned into a New Year's party, celebrating the conclusion of a very successful year. The association had at that time 394 members and a cash balance of about \$3,000.

From these quarters the association was obliged to retire by reason of a fire that destroyed the building; but on May 1, 1906, the organization decided to take a five-year lease of the five-story brick dwelling, 283 Dartmouth street, in Boston, with the idea of making this the permanent club home. Almost next door to the Hotel Vendome, within a few steps of Commonwealth avenue on one side and Copley square on the other, and with a broad stretch of unbroken asphalt to form the street surface in front, this house was at once recognized as particularly well located; and for two months all sorts of workmen were employed, remodeling and refitting and refurnishing the commodious interior. On July 12 the house was informally dedicated, with speeches by President L. R. Speare, who received the keys from Secretary James Fortescue, and by Vice-President H. W. Whipple, President P. J. Coghlin, of the Worcester Automobile Club, and others. The association entered its new building with a membership of 600.

The association has held a number of race meets and hill climbs, all successful, and last November tried its hand at gymkhana sports.

The officers at present are as follows: President, Lewis R. Speare; vice-president, Harlan W. Whipple; secretary, James Fortescue; treasurer, Harry Knights; directors, Charles E. Fay, Arthur Hinchcliffe, Arthur P. Underhill, John C. Kerrison and George W. McNear. Mr. Speare has been president since the association was first organized, and has proved a popular and efficient officer.

Other organizations which have played their somewhat more utilitarian part in the automobile activities of Massachusetts in the past two years are the Massachusetts State Automobile Association, an A. A. A. organization composed of all the leading clubs; the Automobile Owners' Association, largely for protective purposes; and the Boston Automobile Dealers' Association, which has continued to look after the interests of the trade.

MOTOR BOATING IN NEW ENGLAND WATERS

SCRATCH the skin of a New Englander and you disclose a man who loves the sea. On no section of our country's coastline is there such a marked development of the sailor instinct as is inherently engrafted in the citizen of the New England States, notably those of Massachusetts and Maine. In any foreign port one is sure to find the Yankee salt aboard some vessel in the harbor, and usually in some position of command, a significant truism.

Nature's prodigal hand has lavishly bestowed on New England's picturesque coastline a magnificent series of deep indentations—bays and admirably sheltered harbors, the equal of which would be hard to duplicate in any other 2,000 miles of rocky shore. Every favoring condition has fostered the aquatic temperament and it needed but the advent of the motor boat to crystallize this phase of character into a ruling passion.

From the Connecticut State boundary on Long Island Sound to the farthest coast limit of Maine at Eastport, thousands of motor-driven craft, embodying every type from the humble dory of the industrious fisherman to the palatial cabined yacht of the Boston copper kings. So great has been the demand during the last half dozen years that builders have been driven to their wits' end to fill orders.

The head and center of the market for motor boats in New England is, of course, Boston and its environs, with its unequalled harbor and that splendid expanse of sea water, Massachusetts Bay, whose northerly extremity is Cape Ann, and whose southern end is tipped by Cape Cod. Within this charmed circle is the beautiful harbor of Marblehead, the famous mecca of all motor boatists and yachtsmen in summer. Just now, interest in motor boat circles is centered in the big race for this type of craft, of 270 miles, from New Rochelle, N. Y., to Marblehead, Mass., which will start on July 20, for the Stevens cup. This race is for cruising power boats between 30 and 40 feet over all, and these will be rated on a modified rule, and time allowance will be figured at 60 per cent. of the regular allowances. The boats will be allowed to make one stop for supplies at Cottage City.

In and about Boston, the motor boat has reached its highest development as a commercial conveyance, due largely to the great fishing industries of the coast, of which the Hub is a center. Prior to the advent of the gasoline marine motor, these industrious sea merchants plied their dangerous vocation with sail power. To-day the sail is but an auxiliary, and there is scarcely a vessel in the fishing fleet that is not supplied with a gasoline engine.

New England's inland lakes also offer a fruitful field for the pleasures of motor boating. Thousands of these lakes dot the map, especially in the States of Maine, New Hampshire and Vermont, and all of them teem in summer with power boats, big and little. They are now considered a part of the regular equipment of the summer resident, and the delightful climate is yearly increasing the number of these summer visitors in the inland mountain districts as well as at the shore resorts.

The industry of boat building, always an important one in this part of the Atlantic Coast, has vastly increased under the impetus given by the application of the motor as a power factor, and bids fair to assume proportions that will astonish statisticians within the next ten years.

THE NATIONAL CHAUFFEURS' CLUB.

The National Professional Chauffeurs' Club has its Eastern headquarters at 1947 Broadway, New York City. Its officers are as follows: President, Alden Markham; vice-president, Wm. C. Hurst; treasurer, E. Nassoy; financial secretary, Bertrand Hope; recording secretary, Philip A. Hagel. A recent announcement by the club contains the following:

"This club is organized to encourage the education of its members, and to bring to those members that high standard of efficiency that employers will recognize the advantage of employing members of the National Professional Chauffeurs' Club who have passed an examination necessary to obtain a certificate of membership in this club."



"MAXINE," J. H. MCCARTHY, BOSTON, OWNER AND CAPTAIN; WINNER OF MOTOR BOAT RACE HALIFAX RIVER, FLORIDA, FEB. 22.

MINNEAPOLIS HAVING ITS BIG SHOW.

MINNEAPOLIS, MINN., March 4.—The first annual Minneapolis automobile show opened Saturday afternoon under the most satisfactory conditions. The new National Guard Armory is crowded with cars and the balcony spaces are packed to their utmost with accessory exhibits and special exhibits of various kinds. The show is drawing crowds from all parts of the Northwest, as it is the first exhibition of the kind given west of Chicago.

The formal opening occurred at 8 o'clock, when Governor Johnson and Mayor Haynes of Minneapolis delivered short addresses. Nearly 100 cars are in place on the floor of the Armory. The big drill hall is magnificently decorated, the general effect being the most satisfactory that has characterized any show ever given in the Middle West. The costly decorations of the Chicago show were transported to Minneapolis almost in their entirety and are displayed to better advantage in the Minneapolis Armory than they were in the Chicago Coliseum. The general scheme of the decorations is in purple and gold. A sky of bunting overhangs the entire hall, and thousands of lights make the scene a most brilliant one at night. The heavy plaster friezes, pillars and other parts of the decorations brought from Chicago have been used with wonderfully good effect.



NATIONAL GUARD ARMORY WHICH HOUSES THE SHOW.

All of the exhibitors of cars are retailers, with the exception of the H. E. Wilcox Motor Car Company of Minneapolis, which shows for the first time the Wolfe car, built by the company.

There are a number of novelties displayed. Electric power has been used to drive the exhibition chassis and stripped models of the demonstration cars on the floor of the Armory. The exhibitors are as follows:

Main Floor.—Pence Automobile Co., Jordan Auto Co., Northwestern Cadillac Co., Haynes Automobile Co., Fawkes Auto Co., Northwestern Automobile Co., F. G. Winston, Jr., Columbus Buggy Co., G. W. Caplin, Walter G. Benz, A. C. Bennett, Evans Motor Car Co., Aerocar Co., Barclay Automobile Co., H. E. Wilcox Motor Car Co., W. C. Thornhill, Wallis Coach & Carriage Co., East Side Auto Co., Maxfield & Rice Bros., A. F. Chase & Co., Auto Selling & Repair Company.

Balcony Exhibitors.—C. J. Smith, St. Paul; Invincible Tire & Armor Co., Hartly, Iowa; Louglin & Brugger, Fon du Lac, Wis.; V. Houbert, St. Louis; Bailey Leather Tire Co., Milwaukee; Tokheim Mfg. Co., Cedar Rapids, Iowa; Gugler Electric Co., O. Fenstermacher & Co., Hoills Electric Co., Frederick Roach, Penn Oil & Supply Co., J. N. Johnson Co., Beckley Ralston, Shadegg Engine Co., Minneapolis Electric Motor Co., Sorg-Bader Co., E. J. Hodgson, Fawkes Automobile Co., Index Speedometer, Evans Motor Car Co., Western Auto Co., General Electric Co., Twin City Motor Co.

GITHENS WILL NOT LEAVE THE G & J TIRE CO.

DETROIT, MICH., March 4.—H. A. Githens, long identified with the G & J Tire Company, positively denies the report that he intends resigning his present position to become identified with the Empire Automobile Tire Company.

CHICAGO TRADE ELECTS GUNTHER.

CHICAGO, March 4.—At the annual meeting of the Chicago Automobile Trade Association Joseph F. Gunther, manager of the Chicago branch of Thomas B. Jeffery & Company, was unanimously elected president. It was expected that there would be an opposition ticket in the field, but the movement collapsed owing to the refusal of Orlando F. Weber, agent for the Pope cars, to head it. Thomas Hay, manager of the Chicago branch of the Ford Motor Company, had been nominated as secretary, but declined owing to press of other matters, and Fred Dayton, manager of the local branch of the Electric Vehicle Company, accepted the office. Henry Paulman, Chicago agent for the Pierce, was elected vice-president, and Walter Githens, who held the latter office during the past year, was selected for the post of treasurer, the election of all the officers being by acclamation. Ralph Temple, the retiring president, was elected a director, with Orlando F. Weber and F. W. Cornish as his associates on the board. Mr. Gunther, who officiated as treasurer last year, was one of the original founders of the organization. The matter of contests was the only other business considered, and it is proposed to repeat all those held last year.

A resolution was adopted requesting the A. A. A. Touring Board to end the tour in Chicago.

A petition was also prepared and presented to S. A. Miles, urging that an earlier date be named for the holding of the Chicago show.

PORTLAND, ME., HAS SUCCESSFUL SHOW.

PORTLAND, ME., March 2.—With band playing, thousands of electric lights blazing, and a big throng leaving the building, the second annual automobile and power boat show in Portland came to a triumphant conclusion this evening. For one solid week the exhibition had held sway in Portland's biggest show building and during that time, forenoon, afternoon and evening, crowds had filled the building. One year ago Frederick M. Prescott of Boston gave the first Portland show. While it was in a measure successful, the financial end did not come up to expectations. Mr. Prescott was not disheartened, however, and immediately re-engaged the Auditorium for 1907, and has now secured it for 1908. Mr. Prescott announced at the end of last week's show the complete success of the venture from every standpoint.

Although the streets of Portland were piled high with snow during the show week, this did not deter the various exhibitors from demonstrating their cars, and many a machine received a very trying try-out. The weather itself was favorable for the exhibition and hundreds of people came from all over the State to attend the show.

RAMBLER'S NON-STOP RUN OVER 2,000 MILES.

MILWAUKEE, March 1.—After running 2,002 miles in 140 hours and 36 minutes, Van Evra B. Martin's three-year-old Rambler brought its non-stop run to an end in this city through the clogging of a gasoline pipe. The run was started upon by the owner of the car, an enthusiastic autoist who had taken exception to an article in a Milwaukee paper saying that stock cars were not equal to the non-stop runs performed by various manufacturers. Van Evra B. Martin's intention was to run one thousand miles without stopping the motor, but he more than doubled this distance and might have gone still further if the run had been confined to Milwaukee boulevards. The run was started with no other preparation than new tires and batteries. Mr. Martin drove the machine himself for most of the distance.

PREMIER TO BUILD A WATER-COOLED "SIX."

INDIANAPOLIS, IND., March 4.—The Premier Motor Manufacturing Company will bring out a six-cylinder water-cooled car next season. Factory experts are now at work on the design, and a trial car will be ready, it is expected, within a few months. It is understood that the Nordyke & Marmon Company will bring out a six-cylinder air-cooled car next season.

KELSEY'S TAXIMETER CAB PLANS.

C. W. Kelsey, who has now definitely announced the organization of a large company for the building and operating of taximeter cabs and delivery wagons in the larger Eastern cities, of which he is to be general manager, is now in New York City completing the details of the organization. Mr. Kelsey said recently in discussing the cab situation:

"We shall be ready in a very few weeks to announce to the public the details of the methods by means of which we shall be able to give to New York, Philadelphia, and Boston (and later to other cities) the most complete and reasonable-priced cab service they have ever had. The cabs will be put in service as fast as they can be built, the style of design and construction having been already decided upon. The cabs will be driven by chauffeurs who will handle them upon a percentage, and the method in use abroad of using an indicator showing that they are available for hiring, will be installed in this country. A flag, which will be tipped down when the cab is in use, will be displayed as soon as the call is at an end and the cabs will be ready for service whenever and wherever they are seen with the flag flying. The mechanical device known in Europe as a taximeter will show the occupant just how far he has traveled and what he will have to pay for the service. The prices will be far lower than those now in vogue, even for horse-drawn cabs, and, of course, the service will be far more satisfactory.

"In addition, the company will build delivery wagons and trucks which will be leased to merchants and business houses of all descriptions by the year, and will be kept in repair by the owning company. This will take from the merchant the bother of establishing garages and repair shops, and as the drivers are to be furnished with the wagons, there will not be the trouble heretofore encountered in securing reliable help. To provide for this business, the new company will establish large shops in the cities mentioned, and extensive schools similar to those run by the street car companies for the training of drivers. There will be also a system of inspection and repairs, by which every vehicle will be thoroughly overhauled at short intervals."

PHILADELPHIA'S PUBLIC AUTO LINES.

PHILADELPHIA, March 4.—On Thursday last the Highway Committee of City Councils negatively recommended the ordinance introduced in the interest of the People's Vehicle Company, asking for a 25-year franchise to operate automobile omnibuses over many of the principal streets in the city, the knock-out being based upon City Solicitor Kinsey's opinion that councils could not constitutionally sign away the sole right to the use of the city's streets for such a purpose. Such a right, he intimated, lay only with the State Legislature.

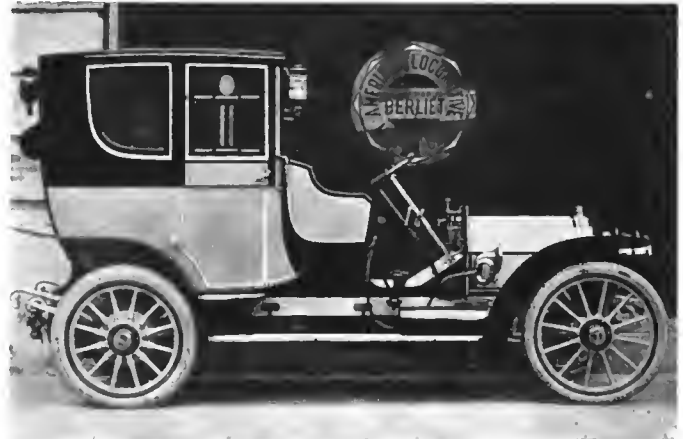
At the same time the committee favorably recommended the Abrams bill, introduced last December, and giving any transportation company the right to use any or all the streets of the city for operating public autobus lines, and providing for the payment of licenses for such vehicles graded according to the number of passengers carried (up to 30), setting forth the minimum width of tire allowable for vehicles of various weights up to 20,000 pounds. This ordinance had been introduced in the interest of the Auto Transit Company, of Philadelphia, which claims to be able to put a score of buses on Broad and Diamond streets within a month or six weeks after Councils finally pass the measure and the Mayor's signature makes it a law.

The vehicles which the Auto Transit people propose to put on the initial route from City Hall to Fairmount Park via Diamond street, are of the Imperial type, built by the Commercial Truck Company of America, and will be of the four-motor, four-wheel drive design. Although no definite announcement has as yet been made as to the rate of fare to be charged, it is asserted that the Auto Transit Company believes that it can make a profit on the "five-cent, no-seat-no-fare" basis. With a maximum seating capacity of 30, this would seem to be a doubtful proposition.

AN ORIGINAL AUTOMOBILE BODY.

It is a curious fact that after hundreds of years of development the seating accommodation of a horse-drawn vehicle should show practically no progress. The royal coaches of Louis XIV., for instance, are equal in comfort, for a given area, to anything our modern carriage builder produces. When the first automobiles came the driver and his guests sat on a plain wooden seat in a box-like body. Ten years brought greater changes than ten centuries had been able to produce under the horse period, and the automobile body of to-day is the most commodious, comfortable and luxuriously-fitted of any road vehicle that has ever been brought forth.

The countries of the old world have paid most attention to the luxurious type of closed automobile, but that America can produce work equal to the best of the most famous French carrossier is proved by the handsome body built by C. P. Kimball & Co., of Chicago, now on view at the American Locomotive Company showrooms on Broadway and illustrated herewith. The coachwork is mounted on a 22-horsepower Berliet chassis, and forms a happy combination of the best French mechanical skill and the highest American art in bodymaking. The feature of the vehicle is that it is a modernized type of an old English coach, and has all the charm of that old-time vehicle without any of its



OLD ENGLISH COACH BODY, DESIGNED BY KIMBALL.

inconveniences. The body is painted a pale yellow with black lining and black underbody. At the rear is a projection forming a pocket in which swords and pistols were carried in the good old days. Two rear lamps outside and close to the roof add further to the old-time appearance of the vehicle. The side windows are provided with wooden panels sliding into pockets—another old-time idea. All the exterior fittings of the car have a gunmetal finish; the door handle and grip is handsomely carved and really a fine piece of work. Gray broadcloth is the material used for interior upholstery, but is only applied to the seats, floor and lower part of the body, the roof and upper portion of the sides being in polished mahogany. There is one rear seat with seating room for three and two folding seats facing towards the rear. The two outside rear lamps light the interior, but additional illumination is supplied by a couple of electric lamps. A speaking tube communicates with the driver and numerous pockets are supplied for maps, books, etc. Head and side lamps are acetylene, the rear lamps burning kerosene. Wheelbase is 112 inches, track, 55 inches.

UNABLE TO SECURE SKILLED WORKMMEN.

OMAHA, Neb., March 4.—Scarcity of skilled labor has compelled the Karbach Automobile & Vehicle Company to discontinue the manufacture of motor trucks for a year. Advertisements for skilled automobile workers, placed in Eastern papers, failed of successful responses.

AN AEROPLANE BY NOTED INVENTOR.

PARIS, March 1.—An important flying machine of the heavier than air type is expected to make its first appearance before the public in a few days. The aeroplane, which is under construction at the Voisin Frères factory at Billancourt, near Paris, is in general appearance similar to the latest Santos Dumont models. It consists of a cellular frame, presenting an area of about 45 square meters, and weighs altogether 400 pounds. The motor is an eight-cylinder, 24-horsepower air-cooled Buchet, with cylinders forming V, carried at the forward end of a wooden frame very similar to the frame of an automobile, and driving a two-bladed fan. The aeroplane is the property of M. Kapferer, a well-known Paris engineer, who was the first to place on the market

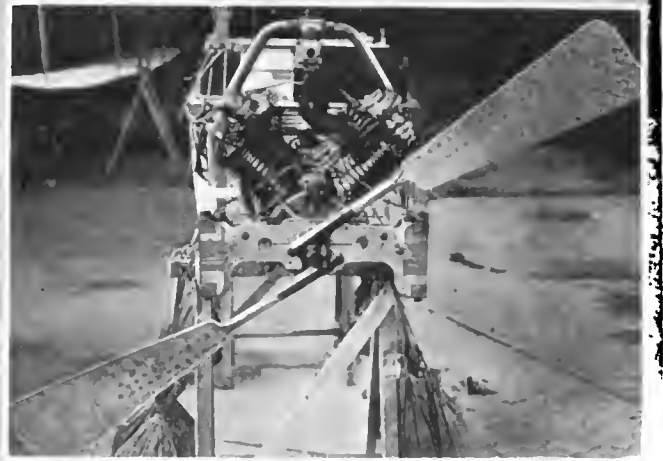
the dismantlable rims which played such an important part in the Grand Prix and other European races last year.

Santos Dumont has removed. On the polo ground at Bagatelle, in the Bois de Boulogne, he was cramped for room and was, in addition, always afraid of coming down on the heads of the numerous sight-seers who gathered to watch his attempts at flying. He therefore this week took up his quarters at Saint-Cyr, to the west of Versailles, where a big shed has been built for him on a large open plain used by the cadets of the military school. The



M. VOISIN.
Head of the well-known
French aeroplane
works.

shed is a commodious structure, with big glass windows, allowing the aeroplane to be taken in and out without any difficulty. No. 14bis, the first machine heavier than the air with which the young Brazilian accomplished a successful flight, is being replaced by a larger model, measuring 40 feet from tip to tip, but only 2 feet in width. The framework is of mahogany, covered with varnished cotton. Between the two wings will be installed a 50-horsepower Antoinette motor of very light weight, specially designed for flying machines. Later this will be replaced by a 100-horsepower motor of the same make. The pilot will be placed above the motor, with the controlling levers in front and the rudder and propeller astern. Santos Dumont has obtained such a satisfactory equilibrium that he has decided to run his flyer over the ground on one wheel only. All previous machines have been started on two wheels. It is expected that the machine will be sufficiently advanced to compete for one of the most important prizes of the Aero Club of France before the winter is over.



EIGHT-CYLINDER BUCHET MOTOR FOR KAPFERER AEROPLANE.

SUCCESSFUL AEROPLANE FLIGHT IN PARIS.

A cable from Paris to the *Herald* announces that M. Vuia has succeeded in flying in a distance of about fifteen yards at a height of four feet and at a speed of about thirty miles an hour. The experiments were made on the Bagatelle polo ground, close to the Bois de Boulogne, Paris, where most of Santos Dumont's flights were made. The Vuia aeroplane has not been so successful as the young Brazilian's machines, but her owner is hopeful of better performances when minor improvements are made.

OLDS "MUDLARK" TO HAVE A HOME COMING.

AKRON, March 4.—The *Mudlark*, the Oldsmobile in which Andrew Auble and Fred. W. Work, of Akron, and R. R. Owen, of Cleveland, rode through sand and mud and water from New York to Florida, has been in this city all this week. It is still equipped with the accoutrements that were used to pull the machine through mud and sand in the Southern States. The machine still carries two of the original Goodrich tires that were on it when it left New York.

Messrs. Auble and Work brought the machine from Cleveland to Akron under adverse conditions in 1 hour 40 minutes. The distance is thirty-five miles. The machine will be driven to Lansing, Mich., where it first saw shape.



M. KAPFERER'S NEW AEROPLANE UNDER CONSTRUCTION IN THE VOISIN FRERES FACTORY NEAR PARIS.

A RUN ROUND THE GRAND PRIX COURSE

PARIS, Feb. 26.—A temporary spell of fine weather had improved the roads somewhat, though the routes in the immediate neighborhood of Paris were far from being inviting, when an invitation came along for a run round the Dieppe circuit. Out through the Porte Maillot, a few miles' bumping over rough *pavé*, and the typical national highways were struck and allowed of good running for the time of the year. The circuit was entered at Londinières, the point nearest to Paris, and a run made up the easterly leg to Eu. These are not the routes nationales, or first-class roads of France, supported by the government, but departmental roads, maintained by the department. Nevertheless they are excellent routes, and permit of the fastest

whose body appeared to have developed in undue proportion to his legs; another carried a couple of milk cans, and was accompanied by a sturdy youngster who ran along by the side of his team, stopping an instant to give a passing cheer to the auto. There is rather a sharp turn under the Dieppe railroad near Eu, and a little further the village itself is struck and the coast leg of the circuit started on. Although the turn is in the heart of the village there is so much space that the racers will not be at all hampered. Eu to Dieppe is a splendid run, winding and hilly at first, later straight and wide, with a view of the English Channel from time to time on the right. But for the photographer in the rear we might have imagined we were practicing for the



A FINE STRETCH OF NORMAN ROAD ON WHICH THE FORTY-THREE WILL SHOW LIGHTNING SPEED.

going. Despite the wintry season the country has a certain charm, with its old orchards, stocked with spreading apple trees which in less than three months will be a picturesque mass of white and colored blossom, its healthy-looking cattle and pleasant meadows. There are a few sharp grades, turns that call for a little skill at high speed, but which are in no way dangerous, and some long straight stretches, with the ribbon of hard gray road stretching out for a couple of miles ahead, tempting the driver to let his four-year-old Renault out to its utmost power until pulled up by the exasperating photographer in the rear of the tonneau with the remark, "I must have a snap at that."

A curious sight was supplied by the primitive little carts pulled by a team of dogs. The auto was stopped as we approached one of these equipages, and the fair Normande sitting in the vehicle asked to pose, which she did without any demur, and with as much natural grace as a Parisian. The dog carts are quite a feature of this part of France, and several were passed while running round the course. One carried a patriarchal individual

race. These roads are never muddy, thanks to their hard surface and the fresh breezes always blowing in from the sea. Dieppe is not touched, the sharp fork-like turn being nearly two miles from the herring town. The turn resembles that of La Fourche on last year's Sarthe circuit, but is much more easily negotiated. Down the third leg of the course from Dieppe to Londinières we fall in with the local railway, which claims a share of the highway. It is not an important affair; the express makes a poor speed showing compared with even our ancient model, all service will be stopped on the day of the race, for the Grand Prix is a fête day, but it is none the less an inconvenient neighbor. For some distance it narrows the road considerably with its high bank. To get more width some of the trees on the inner side will have to be cut down. What is the cost of a few trees? Has not the district offered one hundred thousand francs to the Automobile Club of France? One hundred thousand francs, it is the subject of conversation in every café, and there is not a laborer in the country who has not calculated how long it would



A FEMALE PEDLER AND HER FIVE-DOG TEAM.



RUNNING INTO THE PEACEFUL VILLAGE OF EU.

take him to earn that amount at three francs a day. Envermeu is one of the more important villages on the course, which can be passed through without any difficulty, despite its scattered elongated formation. Its center of attraction now is a village shop, where wax candles, groceries and gasoline can be bought "half wholesale" or retail, a village inn, and an ancient church. The last named will be indifferent to the auto race, but the two for-

mer have an eye open to business and a high ideal of the glorious days which are coming. There are no signs of work on the course yet, but plenty of preparations. The landlord of any of the inns on the forty-seven miles of circuit will tell you all about it, and give the names of every member of the racing board, the list of competitors, their past performances and their full pedigree if you desire it.

IMPORTANT GRAND PRIX PREPARATIONS

PARIS, Feb. 24.—One of the most difficult points to be regulated in connection with the Grand Prix, is the placing of the replenishing stations. Supposing no further entries are received, there will be forty-three competitors, thirty-four of which must be supplied with gasoline at the rate of 6.6 gallons per 62.1 miles, and nine with half this amount. Last year a station was given for each firm, the cars stopping before their familiar sign to take in gasoline, change tires or affect repairs. As the racers will have to take their gasoline in two, or perhaps three doses, it being impossible to carry the full amount from the start, it has been suggested to give a separate station for each machine. Different firms will have from one to five cars in the race, and it is quite possible in the excitement attending the arrival of a machine to hand over the gasoline tank for number 10 to number 20, and probably put the whole race in danger. All machines are

being built to work as near to their fuel limit as possible, and none of them could afford to get the tank of a rival with even a slightly less quantity to his credit. Nor must the unclaimed fuel supply of a broken-down racer be available for surreptitiously feeding its more fortunate companions. The regulations stipulate that the reservoir of each machine shall be filled at the commencement of the race, and the surplus gasoline placed in a sealed vessel and placed at the driver's disposition. Forty-two stations would make an exceedingly long line, and place some of the machines out of the range of vision of the grand stand, a serious defect, for the work at the stations forms one of the most interesting parts of the race. For this reason many of the members of the racing board are in favor of one station per firm, with distinctly marked gasoline cans for each machine, and a very severe control to prevent the possibility of fraud.



THE LOCAL RAILROAD CONSIDERABLY NARROWS THE ROAD.



ENVERMEU IS A TYPICAL NORMAN VILLAGE.

TIME FOR AUTOISTS TO WORK OPENLY FOR ROADS

By JAMES W. ABBOTT, Ex U. S. COMMISSIONER OFFICE PUBLIC ROAD INQUIRIES.

LOS ANGELES, Cal., March 1.—The work for good roads which has been done of recent years in California has lately reached the stage of an impatiently insistent demand that relief be afforded "right away off." A very prominent man of affairs in Los Angeles said to me the other day: "I haven't had my automobile out of the barn in two months; the roads are impassable and I couldn't get anywhere with it." Recently I had occasion to go from Los Angeles on the electric car to Pasadena. As we sailed along thirty miles an hour we came upon a very suggestive spectacle: sunk in a sea of mud was a fine automobile. Attached to its front axle was a long block and tackle contrivance which led to a distant snubbing post. Stretched along either shore of this bayou were enough people for a good-sized village, and a system of foot tracks in the mud was calculated to inspire belief that a futile effort had been made by these sympathetic human beings to extricate the vehicle.

the moribund National Good Roads Association became practically extinct. June 30 of the same year the "Office of Public Road Inquiries" expired by operation of law and its methods of educating public sentiment came to an abrupt termination. When the old "Division of Tests," renamed the "Office of Public Roads," began to operate along the lines now followed it became evident that the generation on the stage of action to-day would be walking the streets of the New Jerusalem long before any great advance in the cause would be made from that influence. I was present at many conferences in different and widely separated cities, where men who had been actively engaged in the work discussed plans for forming an association to take up the work and conduct a campaign for good roads on a general method akin to that followed in a national political campaign.

It seemed to be a logical scheme of organization to unite in the executive board of such national organization all interests, which



A FRENCH ROAD IN EARLY SPRING—NOTE ITS EXCELLENT CONDITION—MATERIAL FOR REPAIRING IS PLENTIFUL.

And all this was on the main highway connecting the two most beautiful cities of California, whose centers are scarcely a dozen miles apart. The millionaires of these two cities might build an Appian Way along this road and never realize that they were out a cent. The owners of property along the road might contribute the funds to make it a perfect highway and find their assets actually increased in spite of the outlay.

It is just a phase in the period of evolution towards full civilization in America. It is comforting to realize that others who have made greater progress had to pass through just this stage.

But to the readers of THE AUTOMOBILE there are other still more inspiring reflections. It is just because these automobiles stick, and throw mud, and bring to those who attempt to ride in them unspeakable grief that this present frenzy for something better has come about. It is on and will stay on till the automobiles get emancipated. I have seen it coming and done what I could in a humble way, here and there, to inflame it.

Studied Good Roads Movement for Seven Years.

Having studied the good roads movement intimately the past seven years all over the United States, I have had exceptional opportunities to watch its growth and its changing phases. I was present in Portland, Ore., at the convention in June, 1905, when

would be pecuniarily benefited by road betterment. On such board the automobile, carriage, farm vehicle, street paving, brick making, and very many other industries would have representation. So far as I know this idea was never carried out.

Time for Autoists to Make Road Question Their Own.

Meanwhile industrial history has been making rapidly. If I read aright the signs of the times, the hour has come for the automobile interests to take up the road question as *their question*, and to deal with it as a *sine qua non for them* and one which for that reason they are going to take sole charge of and solve. The time has passed when all mankind was divided into two parts: one, an insignificant minority, using the death-dealing go-devil as a luxury, with reckless disregard of their own or their neighbor's anatomy; the other, the balance of the human race, whose sole interest in these infernal machines arose through a common instinct for self protection. In less than half a score of years they have jumped from a position of tentative experiment to a place beside the steam engine as an indispensable requisite in the world's progress.

When the automobile captured the farmer it had conquered the world. The hayseed of other days may once have been correctly depicted in overalls and whiskers upon the board seat

of a rickety wagon, holding the lines over a pair of venerable plugs. The passing of this type is, in my mind, the most important fact of the Twentieth Century to date. The farmer of to-day is the nabob. His mortgage has been paid off, he has money in the bank, travels for pleasure, and rides in an automobile. Not all of him, but enough to indicate with certainty the economic changes which are imminent. From this time on his interests square absolutely with those of the rapidly augmenting element to which the motor car has become an indispensable necessity. In the conquest, which is just ahead, for the commercial vehicle, the farmer will be strictly in it. The truck car will haul his products to rail or water; with motor devices he will plow, plant, sow, and till his fields and gather his harvests. It is easy to see what the commercial vehicle will do in every line of work.

Automobile Needs and Should Get Roads.

Having now reached the period when the motor car industry affects every possible department of human activity, what could be more logical than for that interest, as such, to take up the road question and proceed to solve it? No one can say longer that the automobile interest should hold itself in the background lest it arouse antagonism. The automobile interest has become IT in the world. The Automobile needs good roads. It should combine its forces and get the roads.

Just how that should be undertaken, I am not prepared yet to say. I think the first thing is for those interests to announce boldly that the time for hesitancy has passed, the time for action come, and that the automobile people—makers and users—are going to see that the necessary legislation is enacted, the necessary money raised, and the roads built.

I have always felt myself that a central organization should

have general charge. Hasn't the time come to take up the subject in the executive bodies of your great organizations, and to consider it as a need which you will have satisfied?

And now, reverting again very briefly to the condition which furnished my text: "The needs of California and the movement now started for relief."

By reason of its topography and climate, California has an opportunity to furnish a more striking object lesson of American possibilities than any other section of this continent. The world would be searched in vain for such a pleasure ground twelve months in the year as California would become with a complete system of good roads. So great would be the attraction that even kings would leave their thrones and hasten to try the delights of automobiling among the orange groves and gardens, the fields and the missions, the seashore and the mountains, the luxurious cities and the beautiful towns. No man who loved the exhilaration of the swiftly gliding car would be content until he had come to this enchanted land and seen for himself, and when he went back home he would carry with him the story of what could be done to make this earth a paradise.

A preliminary convention was held last week to devise ways and means to make a start. The laws of California are very backward in their provision for roads. A bill framed on the lines of the New York State aid law will be drafted and an earnest effort made to get it enacted. The legislature is in session. What is done must be done quickly. I have no special interest in California, but I have given the best of my life to this cause, and I want to see it win. Because I so feel I beg you and all my friends who will read this to do what you can to so shape sentiment in this State and to so enlighten this people as to their true interests that such law may be passed.

CONNECTICUT ROAD COMMISSIONER'S PERTINENT REPORT

NEW LONDON, Conn., March 4.—In the abstract of the two years' report of State Highway Commissioner James H. MacDonald, presented to the governor, the question: "What injurious effects, if any, do automobiles have on our road system?" is discussed affirmatively as follows:

At home and abroad this question has been asked any number of times, and I have thought it of sufficient importance to reply to it in my report. It is astonishing how popular motoring has become in our State, and, in fact, all over the United States. Since the issuance by this State of the first license on May 28, 1903, up to the present time, 4,000 licenses have been issued by the Secretary of State. About 400 of these licenses are for motor cycles and about 300 licenses have been issued to transients. No license fee is charged non-residents unless they are to remain in the State for a period exceeding fifteen days. The sum of \$2 is charged for a license. This fee, it is apparent, is only nominal, and the income derived from this source does not amount to a very large sum in the aggregate. The use of the automobile, it must be conceded, will grow rapidly, and, as automobiles have come to stay, the use of the roads by this class of vehicles will form a very large part of the traffic over the highways of the State. If it be true that so many citizens own automobiles and use the roads for business or pleasure, it is equally true that the number of persons using the roads is augmented several thousand by those who come into our State, this latter class contributing nothing to either town, city, county, or State treasury.

Now, the vital question is: Does the automobile injure our roads more than the travel of other vehicles? If so, in what way? It is only fair to take this question up broadly so as to reach a fair conclusion in determining this factor in the solution of this newer problem confronting us in the use of the highways. I have made a close study of this question during the past two years, and I am satisfied that no agency at work on the roads has directed attention to the use of our roads to the extent that the automobiles have. The natural inquiry will be, in what manner has this been done?

It is safe to say, in reply to this inquiry, that our roads have shown more wear on the surface during the past two years than for any similar period since the commencement of macadam construction in this State. In nine out of ten towns artificial moistening of roads is not resorted to by the officials in towns where our

macadam roads have been constructed. The use of the sprinkling cart seems to be a lost art, and the only moisture the macadam receives is from the rain and the dew, except, of course, in winter time, when there are occasional snow storms. For that reason our macadam roads are very dry in summer and become an easy prey to rapidly moving automobiles. The low-hanging machinery of the car restricts the space from the top of the road to a narrow opening which the rapidly moving car transforms into a draft, the suction from which removes all loose or insecure particles from the surface of the road, very much as a carpet sweeper operates.

The screenings top has two useful purposes. One is to form a cushion to protect the second course of stone, which is the top course of stone immediately under the screenings or finishing surface of the road. This cushion protects the underlying stone from direct contact with the shoe of the horse and the tire of the wagon. Its second office is to retain moisture in the summer time, thus preserving the cementic properties of the screenings, and in the winter time furnishing a covering that prevents the entrance of frost into the road, and also removing the possibility of disintegration and heaving of the road screenings. It also operates to prevent the fall rains from penetrating into the courses of stone, thus inviting frost, and leaving the road, when the frost departs, green and very susceptible and responsive to travel.

In the summer time, particularly, when our roads are very popular and are used largely by all kinds of vehicles either for business or pleasure, the passing of one of these rapidly moving cars removes from the road its intended protection. Horse-drawn vehicles that follow are, by this stripping process, brought into direct contact with the stones that have been uncovered by the automobile. These stones are early dislodged from where they were imbedded, and a fracture is made in the road. The stones thus loosened act as an irritant to the other stones when struck by hoof or wheel, the bond is thus broken and the road immediately demands repair, or a large bill of expense will result. If the road is not at once taken care of the influence of even a slight fracture is far reaching. This destructive force has been at work for some time, but its effects have been more noticeable during the past year than ever before.

This description of how roads are injured is apparent, not only to the men who make a business of the art of road building, but is the subject of grave consideration in towns where a macadam system has been laid. All over the State where we have a macadam system officials are inquiring how to remedy the evil.

ACCUMULATORS FOR ELECTRIC IGNITION

By CHARLES B. HAYWARD.

As already outlined in a previous part of this article, the process of accumulator charging and discharging is not a mysterious form of storage for the electric current as popularly supposed, but is purely one of chemical conversion and reconversion. But it is not necessary that the autoist should be an electro-chemist in order to be able to understand or properly take care of a set of accumulators, and it is accordingly not intended to go deeply into that side of the subject here. Nor will the matter of history be gone into further than to state that the discovery that a current sent through a voltaic couple consisting of lead plates immersed in dilute sulphuric acid, set up a chemical

action which could be reversed and a current drawn from the cell, marked the inception of the accumulator or storage battery. That was more than half a century ago and though numerous combinations of other materials have been tried in the interim, none proved practical in a commercial sense until the discovery of the nickel-iron combination in an alkaline solution by Edison. As all the accumulators now on the market for ignition purposes are of the older type, it will be unnecessary to consider any other than this, though it may be added that the characteristics of any accumulator are bound to be very similar regardless of the materials used in its construction. Any form of cell which is reversible—that is, from which a current may be redrawn, after charging it—is, properly speaking, an accumulator, some primary forms having this characteristic, but only in a very slight degree and not sufficient to render them of any value whatever for this purpose.

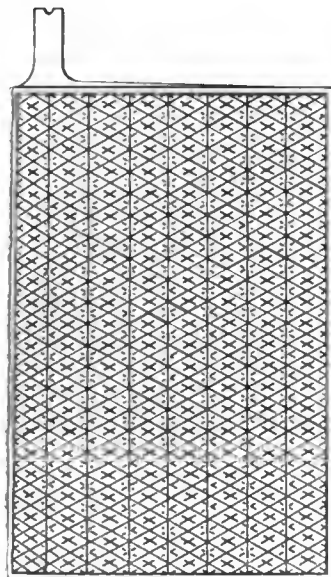


FIG. 1.—Helios Cast Grid before pasting with the active material.

materials used in its construction. Any form of cell which is reversible—that is, from which a current may be redrawn, after charging it—is, properly speaking, an accumulator, some primary forms having this characteristic, but only in a very slight degree and not sufficient to render them of any value whatever for this purpose.

How Accumulators Are Made.

In order that the autoist may not only have a thorough understanding of the subject, but also be able to understand why it is important that an accumulator should be cared for in a certain way and certain things avoided, it is essential to have a knowledge of how an accumulator is put together. In this connection, he should bear in mind those elementary principles that were outlined in the first part of this article as they are directly involved. So far as its essentials are concerned, the statement that an accumulator consists of two lead plates immersed in dilute sulphuric acid, suffices to define it, but it is evident that two sheets of lead dipping into a jar of electrolyte could not very well be carried on the car, so it will be evident that the remaining considerations are purely mechanical. Mention was made of the fact in a previous part of this article that originally accumulators were made by what is termed a forming process. That is, metallic lead plates with smooth surfaces were placed in the electrolyte and "formed" by passing a current through them; in other words, by electro-chemical means. This is known as the Planté type of plate. It has been almost totally superseded by what is known as the "pasted plate," or Faure type. In this, the foundation consists of a grid consisting of pockets or recesses into which the active material is pasted by hand and solidified under pressure. Each method has its advantages, depending upon the service for which it is intended, and it will be found that both are used for auto-

mobile work, though the pasted type practically monopolizes the field, the "Invincible" being the only formed type for ignition use.

Numerous Processes and Types of Grids.

There is absolutely no end to the number of methods of forming or to the types of grids at present on the market, many of the processes being well-guarded trade secrets. It would be of no advantage to attempt to review even the best known types, so that this matter is gone into only to an extent sufficient to illustrate the fundamental principles and methods of construction embodied in every standard accumulator. It was not long after the original discovery of the principle of the accumulator that it was found possible to greatly increase the activity of a simple cell by surrounding the positive plate by the negative; that is, in order that both sides of the positive plate might be active. This accounts for the use of one more negative plate in every accumulator, as in this way both sides of all the positive plates are utilized and the capacity of the battery greatly increased. When the charging current is sent through a cell, the active material, peroxide of lead in the case of the positive and metallic lead in a spongy form on the negative, expands and the electrolyte also changes its density. On discharge, the converse takes place and this expansion and contraction take place to a marked degree, proportionate to the size of the plates. For this reason every cell has a safe charging rate and a safe discharging rate, and greatly exceeding it, particularly in the case of the discharge, causes the plates to warp or "buckle," as it is usually termed, either forcing the active material out of the retainers or bending the plates so much that they come in contact with one another.

The capacity of a battery not only depends upon the square surface presented to the action of the electrolyte, but also to the porosity of the active material and its conductivity. The maker is thus confronted with the problem of making the active material loose and porous and at the same time hard and resisting in order to stand the shocks of usage, without falling out of the plate. The illustrations of the few types of grids shown will suffice to give

an idea of the method of retaining the active material. The first, Fig. 1, is the grid of a Helios cell, while the second, Fig. 2, is that of a Toledo cell, made from chemically pure sheet lead, the completed plate being so flexible that it may be rolled upon itself; many makers employ a composition of antimony and lead in order to secure stiffness, the grids being cast, while others are made directly from sheet lead under heavy pressure. Those referred to are the pasted type. One of the few cells that is made in small sizes by the forming process is the Type H "Invincible" cell, the construction being such

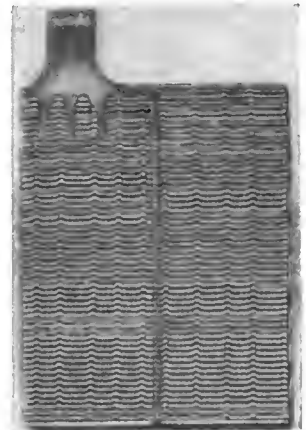


FIG. 2.—Toledo Pressed Plate; made from chemically pure sheet lead.

that the active material is retained by gravity. This type is intended particularly for automobile and marine ignition work, though the method of making renders them more expensive. It will be obvious that in any portable type of cell, such as that required for electric vehicle and ignition work, the chief requisite will be large capacity without undue bulk, and to obtain this the plates are placed as close together as possible. In order to insulate them thoroughly and still permit of the active circulation of the electrolyte upon which the working of the cell depends, grooved wood separators and

perforated hard rubber insulators are employed, a typical group of these parts being shown by the illustration of the Autex plates and separators, Fig. 5, and also by the dismantled unit of the Look cell, Fig. 6. In some small cells, such as for ignition, it is possible to place the plates sufficiently far apart to dispense with separators of any kind as is done in the case of the "Reliance" cell—about



FIG. 3.—Cross section of plate for forming

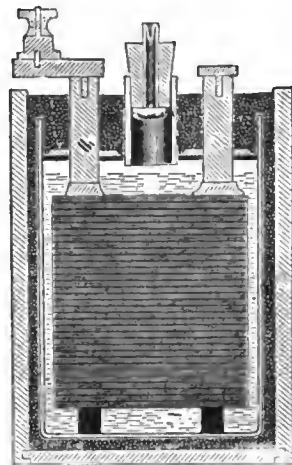


FIG. 4.—Section of American Cell showing components.

the only one made in this country that employs a celluloid containing case.

General Requirements.

An idea of the requirements of the completed cell, other than those already mentioned may be gained from the illustration of the section of an American cell, Fig. 4. This is an end view of the cell and shows that the group of plates is not permitted to rest upon the bottom of the containing case but is elevated therefrom. The supports shown are square strips of hard rubber and the necessity for so placing the plates arises from the fact that the active material is constantly disintegrating to a greater or less extent and falling to the bottom of the jars. As it is a conductor, it would short-circuit the plates if allowed to come in contact with them; for this reason provision is made to allow it to drop free of them. It will at once be apparent that if sufficient of it falls to make a pile that reaches to the plates, the cell will be put out of action. The terminals extending through the case are of the same material as the plates—sheet lead—as any other material would quickly corrode from the acid fumes. In both the process of charging and discharging, hydrogen and oxygen gases are evolved by the cell, so that the necessity for sealing it to render it conveniently portable is complicated by that of permitting the escape of the relatively large quantities of gas produced. Many patented devices are used for this purpose, that shown being a combination soft rubber and glass valve. As only that part of the plates that is immersed in the electrolyte undergoes the changes mentioned and the unequal expansion and contraction would quickly ruin them, it is essential that the solution should cover them at all times, as is shown by the illustration. When a cell is charged rapidly so much gas is evolved that it creates more or less pressure and results in spraying some of the acid out the vent hole. This settles on the connecting lugs and corrodes them; such deposits should be removed with warm water, or a solution of ammonia and water; if this trouble continues the corrosion may be prevented by coating the terminals with vaseline or other heavy grease. With the exception of the outlet provided by the vent, the remainder of the top of the cell is hermetically sealed.

Rating and Its Significance.

Accumulators are always rated in terms of ampere hours—this is known as their capacity and, as already stated, it depends upon the size and number of the plates. By ampere hours is meant the

length of time during which the battery is capable of giving a discharge of one ampere per hour; for instance, a 60-ampere hour battery—the size most often used on the automobile—is capable of giving a discharge of one ampere for 60 hours, 2 amperes for 30 hours, 3 amperes for 20 hours, 6 amperes for 10 hours, and so on, but there is a limit to the rate at which it should be discharged, although some makers, such as the Autex, claim that the discharge rate may be anything desired, and the Toledo, for which it is claimed that a dead short-circuit will not injure the plates, so that these two manufacturers do not caution the user as to the safe discharge rate of the cells. The amount of current demanded by the ordinary ignition system is so small that there need be little fear on this score except when things are in such poor shape as to run the battery down in a few hours—something for which the battery is most often blamed, though not at fault.

The charging rate of a cell is usually the same as its safe discharge rate and should not be greatly exceeded, if good service and long life is expected from the battery. Just what its safe discharging and charging rates may be are usually given by the maker. With all due respect to those makers whose cells will stand a dead short-circuit when fully charged, the autoist is most strongly advised against subjecting his battery to any such test, even when his only object is to see whether it is "loaded" or not. As received from the maker, the battery is usually fully charged and ready for service. Provision for recharging must be made in accordance with the available current supply. The latter must be direct current, as an alternating current cannot be used for charging owing to the fact that it pulsates, first in one direction and then in the other, so that no matter how long a cell were connected in an alternating current circuit it would not have any more current in it at the end than at the beginning. Having ascertained that the current supply is direct, the next essentials are to determine its voltage and its polarity. The former may usually be found on the labels used on the incandescent lamps, or from the central station; the polarity will have to be determined at the point the current is to be used.

Various Methods of Charging a Cell.

The direction of the current having been ascertained, whether by a pole indicator, pole indicating paper or no other means being at hand, by dipping the bared ends of the wires into a glass of water a short distance apart, the one from which the greatest number of bubbles are given off being the negative, provision must be

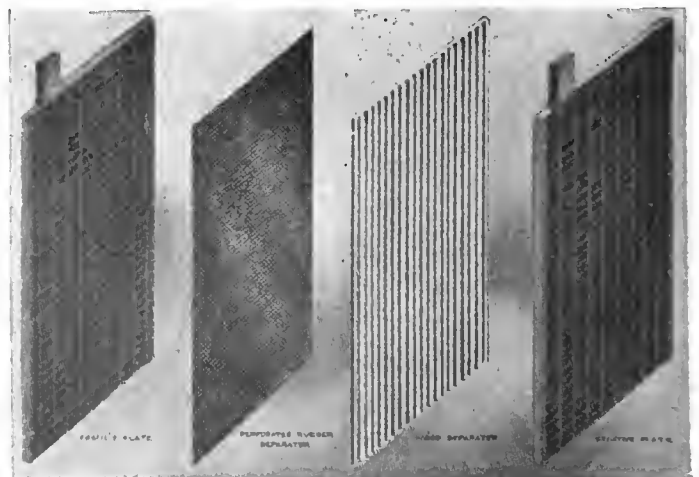


FIG. 5.—Typical group of plates, separator and insulator.

made for sending the proper amount of current through the battery. The methods of doing this are illustrated by the line sketches. Where the service is 110 volt direct current, the battery may be connected in series with a group of lamps in multiple. Fig. 7. At this potential each lamp takes approximately half an ampere of current, so that twice as many lamps as the number of

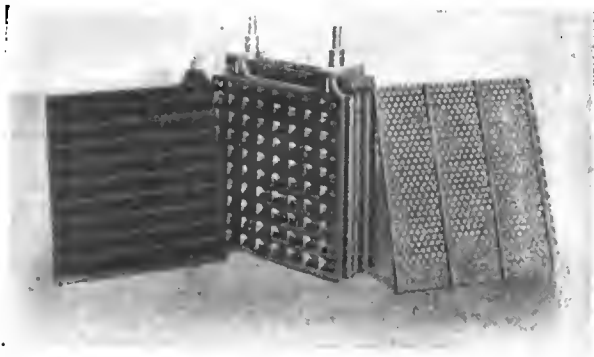


FIG. 6.—Components of Look complete unit ready for assembling.

amperes called for by the charging rate of the battery will be required; where the service is at 50 volts—rarely used nowadays—half the number of lamps will be needed, and at 220 volts double the number, as shown connected in series-multiple, Fig. 8. The sketch, Fig. 9, shows the method of charging from what is known as a three-wire system, in which two 110-volt generators are used

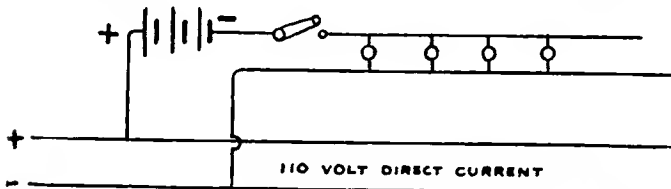


FIG. 7.—Wiring diagram for charging from 110v. direct current with incandescent lamps as resistance.

on three feeders. Any two except the outside pair will give a potential of 110 volts, so that connections may be made as shown; in this the resistance has been omitted, the instrument shown being a circuit breaker to cut out the battery should the charging current cease. Unless provision of this kind is made, the cell will discharge should the generator stop. In Fig. 10 a method of charging from a low voltage generator carried on the car and which is also used for ignition current directly, is shown; when the switch is on the upper point, the battery is supplying the coil and is being charged at the same time from the dynamo; should the motor stop the automatic cut-out prevents the battery from discharging through the dynamo and when it starts again the battery must be connected to receive the charge. On the lower point, the dynamo supplies current directly to the coil. Figure 11 shows an improvement on this method, employing an automatic switch; in this case, the switch takes care of the charging current at all times and the current for ignition is always taken from the battery. This is the method used in the Apple system, the wiring diagram of which is illustrated in Fig. 12, a volt-ammeter being mounted on the panel to give the charging rate and the voltage of the cells.

Shortly after being placed on charge, the voltage rises to 2, quickly increases to 2.2, and then gradually rises to 2.3, at which what is commonly known as "boiling" begins, but which, as already mentioned, is the evolution of hydrogen and oxygen. Above this voltage it becomes very active and the cell actually appears to boil, the ebullition is so strong. The charging should not be continued after the cell shows 2.5 volts while on charge; immediately after disconnecting the reading will be considerably less. In the case of the three-cell battery this means that when approaching repletion the battery itself has a potential of about 7.1-2 volts, so that the source of charging current must be higher than this, otherwise the battery will neutralize it, and either discharge back through the source of current by reversing its polarity or cease to charge. Bubbling is not a certain test of the state of the charge nor, for that matter, is the use of an ordinary pocket voltmeter, or a small lamp. The only really accurate test is that of the specific gravity, the density always being a good indicator

of the state of the cell, the electrolyte becoming lighter as the charge proceeds and heavier as the cell discharges. When fully charged, the proper density is 1.225 and 1.125 when practically exhausted.

Caring for Accumulators.

Both the service to be had from an accumulator and the length of its life will depend upon the care given it. There are numerous cases on record where an accumulator has served for an entire season with but a single recharging and some instances where it has not been recharged at all during that time, but whether used steadily or not, it is a good plan to charge more or less frequently at a low rate once a fortnight or once a month, as this keeps the cells in better condition. It must be borne in mind, moreover, that ignition work is about the most exacting service that an accumulator is called upon to perform; it is seldom called upon to work steadily for any length of time, it is given but little attention and the conditions of service are all against it. The vibration and jolting hasten disintegration and are apt to cause the active matter to loosen, and defects in other parts of the system are apt to run down the cells in a short time so that caring for the accumulator really involves the care of the remainder of the ignition system more than it does that of the battery itself, for if the latter be kept properly charged it will seldom fail to give satisfactory service, other conditions being favorable. For instance, the average coil when in good working order only requires .50 to .75 of an ampere, and a 60-ampere hour set of accumulators when working on such a coil should accordingly give the equivalent of 75 to 120 hours of continuous service. When it is found that it gives but a fraction of this, a defect should be looked for in the wiring system rather than in the battery itself, and the misplaced remedy of using more current than is necessary should not be resorted to; if the system will not run on less than one ampere there is something wrong with it. The cells should be tested with a low-reading voltmeter while the motor is running, as it is one of the peculiarities of the accumulator that it will apparently recuperate on open circuit and show a comparatively high voltage reading though practically exhausted. The coils should also be tested with a low-reading ammeter and adjusted to take the minimum amount of current. The voltage test on the accumulators should be made from time to

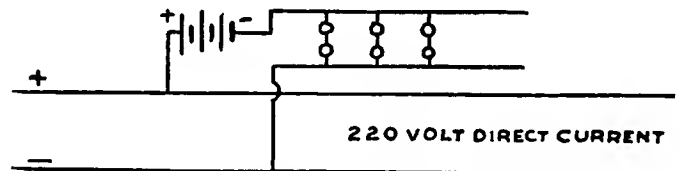


FIG. 8.—Charging from 220v. direct current with 110v. lamps as resistance.

time so as to guard against running them down too much; when found to be in the neighborhood of 1.8 they should be recharged without delay. If this be not done the battery is apt to stop working very abruptly, and then usually everything else but the cells will be suspected. The latter should never be tested with an ammeter, which short-circuits them, or in any other way by

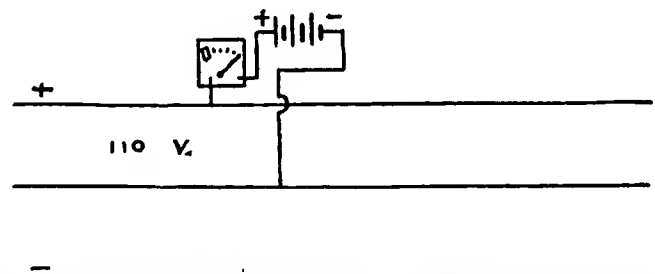


FIG. 9.—Method of wiring for charging from a three wire system with automatic cutout, no resistance shown.

short-circuiting them, such as placing a screwdriver across the terminals. It is harmful to the battery and in the case of the ammeter is apt to be so to the instrument also.

Some Questions Answered.

The following are a few of the questions that continually crop up, these being taken from the letter of an autoist seeking infor-

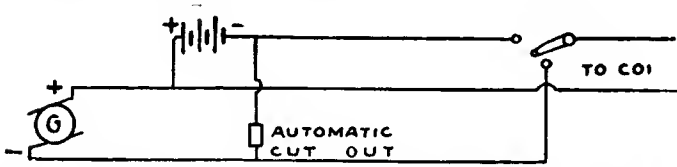


FIG. 10.—Charging directly from a low voltage generator carried on the car

mation on the subject: "What is the duration of life of the accumulator?" This is something that cannot be answered definitely, for with reasonable care accumulators have been known to give steady service for several years and still test close to standard requirements at the end of that period, while in other cases they have lasted but a short time. It is somewhat akin to asking

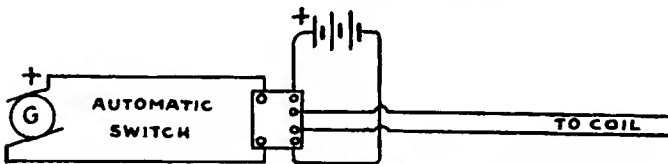


FIG. 11.—Wiring diagram for dynamo and accumulators on car, using automatic switch, usually mounted on dashboard.

how long a man should live. "When partially discharged and standing quiet, will they run down like dry-cells, and why?" Some makers claim that their cells may be left partially or wholly discharged indefinitely without harm, but the average accumulator runs down under such conditions and loses in efficiency because of the formation of sulphate of lead on the plates which covers them and insulates them from the action of the electrolyte. The so-called running down is due to what is known as local action; that is, the cell works internally while not in use and this cannot be wholly prevented. "How far can they be discharged safely, and why not more?" Both parts of this question have already been answered, the former in this part of the article and the latter in the one that preceded it. Absolute exhaustion is considered to

occur when the cell only registers 1.7 volts under load; that is, sparking the motor or other duty, and the reason why it is not safe to go below this limit, as already pointed out, is that the formation of sulphate of lead would occur to an extent where the cell would be ruined. "How can some batteries give more ampere hours than others, as advertised?" This has also been answered; merely because they have a greater amount of surface. "What will cause short-circuiting in the

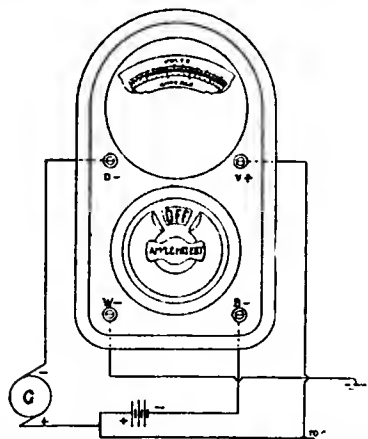


FIG. 12.—Connections of generator and accumulators with automatic switch as employed in the Apple system.

battery?" The loosening of the active material to such an extent that it piles up on the bottom of the cell to the level of the plates or is caught between them. As most ignition accumulators are hermetically sealed in opaque cases, there is no way of telling when this has occurred. The best remedy is to return the battery to the makers. "Why do plates buckle when not charged properly,

and what is the remedy?" This, also has been explained in the foregoing. "What is the average mileage of a battery with a high-speed four-cylinder engine?" Probably a good average would be 800 miles, but there are cases innumerable where this has been greatly exceeded, and, as already stated, everything depends upon the condition of the ignition system itself, the coils, timer, plugs, etc. It is nothing uncommon for a battery to serve for 1,200 to 1,500 miles' running, though it is equally common for them to give out at the end of less than 500 miles, but the fault usually lies with the driver rather than the battery. To sum up, given reasonably good care, which means proper charging, maintaining the electrolyte above the plates by replenishing with distilled water and attention in other ways already pointed out, a good battery will last three or four years and give excellent service.

INCREASE IN AUTO PRODUCTION.

In the course of five years, as revealed by a statement recently made public by the Census Bureau, the production of automobiles in this country rose from 3,723, with a value of \$4,748,011, to 22,830, valued at \$26,645,064, the first figures representing the output in 1900 and the second, those of 1905. This represents an increase in value of 261.1 per cent. Of the 21,692 cars turned out by regularly established factories no less than 18,699, or 86.2, were driven by gasoline; 1,562, or 7.2, by steam, and 1,425, or 6.6 per cent., by electricity. A total of 121 establishments is reported as building complete cars and nothing else, besides which there are 47 primarily devoted to the manufacture of some other line, such as bicycles, sewing machines and the like. During the year covered by the census these factories turned out 1,138 automobiles, valued at \$879,205, and there are in addition 57 factories which manufactured automobile bodies and parts to the value of \$3,388,472.

The total number of cars made is again subdivided, and it is interesting to note that 12,131, or 55.9 per cent., were of the runabout type; 7,220, or 33.3 per cent., were touring cars. Buckboards came next on the list, with a total of 675; Stanhopes fourth, with 520, and delivery wagons fifth, with 411. In the period between the years 1900 and 1905 the number of factories turning out finished automobiles as their principal product increased from 57 to 171, and the capital invested in these establishments from \$5,768,857 to \$20,555,247; in the same time the average number of employees rose from 2,241 to 10,239. The value of American made machines exported increased from \$9,8528 in 1902, the first year they were separately reported, to \$2,481,243 in 1905, or a gain of more than 250 per cent.

ON FAKING CASTINGS.

W J. MAY IN THE ENGLISH MECHANIC.

The cost of a finished casting must, to some large extent, depend on the cost of the metal, or metals, of which it is composed, and therefore for a good many purposes the cost of the castings will be found to vary from time to time. Now, at the present time, copper, tin, zinc, and antimony are high in price; consequently brass and gunmetal and other alloys must be higher in price if the weight and quality be the same as when the component metals are cheaper. Of course, the expert metal-mixer can "fake" his mixtures, and in many cases "load" them with lead, proper treatment making it quite impossible to detect the tricks unless chemical analysis be resorted to; but, as a rule, metals which are faked up do not stand wear well, and although the prices of castings per pound may be kept down, really the increased weight of each casting counterbalances any saving there may be in the cost per pound. In fact, it often happens that castings at, say, one shilling per pound, actually cost less than others at eleven pence per pound, and this simply because the more expensive castings weigh less than the cheaper ones.

Lut in addition to this the difference in initial cost will be found to be more than offset by the greatly lessened service to be obtained from the cheaply loaded alloy.

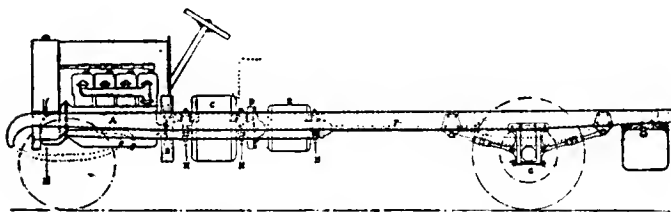
ELECTRIC VERSUS MECHANICAL TRANSMISSION

By E. W. HART AND W. P. DURTNALL.

ONE of the most attractive subjects connected with the automobile is the transmission of power to the road wheels. The subject is a very large one and for thorough treatment would require more space than is available in this paper. Next to the engine, the power transmission is the most important thing about the vehicle, and bad design may make a great difference in the power obtained at the road wheels. It has been proved, by actual tests, that fully one-half of the power developed by the engine is often lost in undue friction between the prime mover and the wheels. The system mostly used at the present time is, in reality, a group of three or more rotating levers, providing not only a reduction of speed but also a fairly proportionate increase of torque at the slower vehicle speeds, something which is absolutely necessary, especially when climbing severe grades. But it must be admitted that beside having other disadvantages this system is exceedingly noisy when the gears are worn. We feel sure that it will be universally agreed that if the gear box can be satisfactorily eliminated it will be a welcome improvement.

Electrical Power Transmission.

That otherwise ideal prime mover, the internal combustion engine, has one great fault: it is wanting in elasticity, and, in order that it may be satisfactorily adopted, some sort of variable speed-changing device is necessary. In gasoline-electric systems, the arrangement usually employed is that of a dynamo coupled



HART-DURTNALL GASOLINE-ELECTRIC BUS CHASSIS.

direct to the engine and furnishing current for a motor coupled mechanically to the road wheel. The vehicle is, actually, an electric car having, in place of the usual battery a generator set. But a true gasoline-electric car is not restricted to any radius of action and requires no re-charging. Probably the earliest system employed was that of Patton (1890) in America, using street cars carrying accumulators and employing a small gasoline engine and dynamo to charge the battery. The engine was always run at full load, the current being taken from the battery for the two electric motors. Beside being complicated, the efficiency of such a system was low.

In the Dowsing system a shunt-wound dynamo was employed, both engine and dynamo being belted to the road wheels and so arranged that the surplus power from the engine was converted into current by charging a battery. When the speed fell below normal the dynamo became a motor, fed from the battery and assisted the engine on inclines. This system showed a higher degree of efficiency than that of Patton. In the Germain system the dynamo field revolved round the armature and the torque there produced was utilized in connection with the current generated to start the car. This permitted a good portion of the mechanical power of the engine to be transmitted direct to the road wheels. A switch was closed in starting, permitting the field to build up and, with the motor, producing full torque. Then the resistance was thrown in shunt with the motor, thus gradually

cutting it out and causing the speed to rise. The dynamo being series wound, when the difference in speed between the field and armature was small, it formed a powerful magnetic and flexible coupling, varying in accordance with the demands made upon it.

The Hart and Other Systems.

The Hart system, first introduced in 1903, consisted of a 40-horsepower gasoline engine directly connected to a compound-

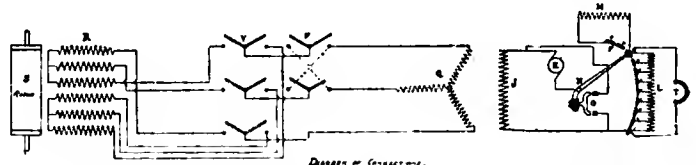
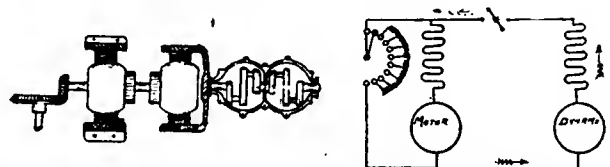


DIAGRAM OF CONNECTIONS, HART-DURTNALL SYSTEM.

wound dynamo. The current generated was sent through a series-parallel controller, to a motor having two distinct windings on both field and armature. Various speeds were thus obtained, the motor being geared by a single reduction to the differential countershaft and a double side-chain drive being employed; for low speeds a metallic resistance in series with the motor was used. This was the first high-powered gasoline-electric car built and has only just been exceeded by the 45 and 70-horsepower car of the Mercedes Electric Company. With a touring body, it weighed under 2,500 pounds and easily attained a speed of 50 miles per hour.

The Fisher system consists of the usual continuous-current generating set, the dynamo being connected, through a series-parallel controller, to two 7 1-2-horsepower series-wound motors, each coupled through a double-reduction spur and pinion gear to the rear wheels. Surplus current is utilized for charging a set of 150 ampere hour accumulators. With complete equipment this vehicle weighs over 7 tons.

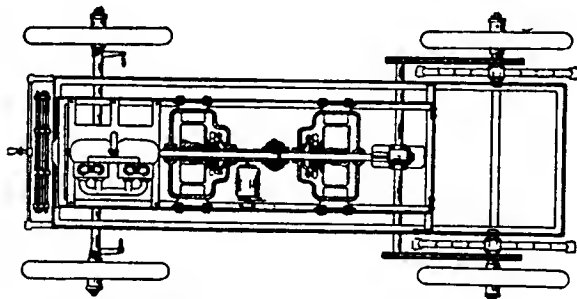
A heavy lorry of this type was taken and converted to the Hart-Durtall continuous-current system. The battery was eliminated and the winding of both generator and motor altered so as to provide for about twelve different speeds, or torque values. The connections as now used are shown by the cut. Assuming that the engine runs the dynamo at constant speed in the switch position shown, no current is generated as no field windings are in circuit. By moving the switch along the contacts the field winding comes into circuit and a low E.M.F. is generated. Current goes to the motor, producing sufficient torque



GERMAIN SYSTEM AND DIAGRAM OF CONNECTIONS.

to start the car; owing to the voltage building up very gradually, starting is much more smoothly effected than is possible with the constant-voltage and series-parallel method. To increase speed it is only necessary to move the switch further, cutting out some of the field windings and raising the voltage; for hill climbing a central position of the switch permits the greatest amount of power to be transmitted with full field on both dynamo and motors; for very steep hills some of the dynamo windings

*Extract from paper read before Society of Motor Omnibus Engineers, London.



CHASSIS EMPLOYED ON THE CAROLAN SYSTEM.

can be cut out, giving a heavy current at lower voltage and producing a heavier torque at lower speeds at the road wheels. The main circuit is never opened, and as the field sections are short-circuited on themselves, no detrimental astatic discharges take place; for a sudden stop, the dynamo field is bridged over, and the magnetic field immediately lost; thus all power is shut off without altering any connections before the brakes are applied; immediately the brakes are off the field is opened again and the dynamo voltage gradually rises, securing perfect starting with constant acceleration.

Some Continental Systems Considered.

The Lohner-Porsche system has recently been adopted by the Mercedes Electric Company, the motors being placed in the hubs of the rear wheels. This disposition cannot be accepted as an efficient one; our experience shows that after a few hundred miles on rough roads the brush gear requires costly attention owing to the chattering of the brushes on the commutator. To reduce this as much as possible the 12 sets of brushes in each motor are thrust on horizontally, which is not an economical form of construction.

The Krieger is what is known as a constant-power system and it has been employed on quite a number of cars. The principle is that of maintaining a practically constant Watt output, *i. e.*, a small current at high voltage for speed on the level, or a heavy current at low voltage for hill climbing. No series-parallel working is utilized. In the wiring diagram, *A* is the dynamo armature; *B*, the self-exciting shunt winding; *C*, independent exciting winding, also on dynamo field; *D*, accumulators for maintaining excitation and running dynamo as motor to start engine; *E*, resistance controlling charging current when running; *F*, series-winding arranged to demagnetize dynamo field; *G*, motor armature; *H*, series excitation of motor; *I*, demagnetizing coil excited by dynamo armature. This is an ingenious method of transmission, the use of but one dynamo and one motor arguing well for efficiency.

The Pieper system, known in England as the Auto-Mixte, employs a single dynamotor and a set of accumulators. The dynamotor is direct-connected to the engine and electrically through a controller to the accumulator; it works as a dynamo or motor according as its E.M.F. is inferior or superior, to that of the battery, yielding additional power for propulsion when climbing. The battery is also used for ignition and to run the dynamotor to start the engine; this current also is used to automatically throttle the engine. The dynamotor is fitted with commutating poles, the windings of which are in series with the armature, insuring good commutation with heavy currents, and with a weak main field.

Characteristics of English Systems.

The Astle-Wallis is an English system that appeared in 1901. It consisted of a 10-horsepower, two-cylinder engine coupled through a friction clutch to a four-pole shunt-wound motor, and a set of accumulators. To start, the motor was run from the accumulators; as soon as the engine came up to half normal speed it automatically began to charge the battery; then by means of a planetary gear the car was practically started on the direct drive

after which the motor aided the engine to accelerate the car's speed. When running at normal speed the surplus power ran the motor as a dynamo and charged the accumulators. On hills this was reversed, the dynamo running as a motor and assisting the engine, the whole arrangement being automatic. An eight position controller embodying a carbon break-switch was employed; this severed the circuit when the brake was applied and did not close it again until the controller was placed in the off position. Running down hill the clutch was withdrawn, and the engine stopped, the kinetic energy of the car being utilized for charging.

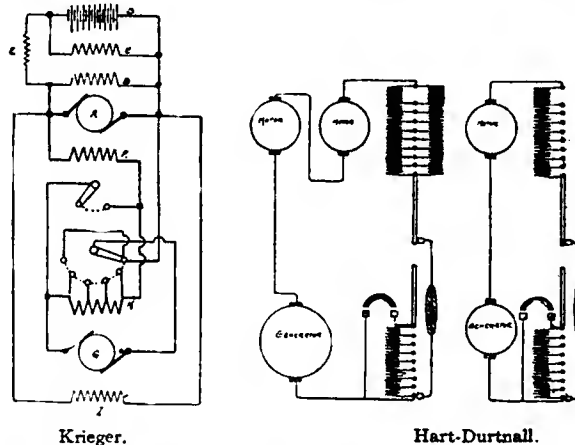
The Stevens is a continuous-current system utilizing two electric motors with the series-parallel method of control on both the motors and the dynamo, the latter being double wound with two commutators and two separate field windings. A pedal-operated resistance opening the main circuit when changing speed is employed to prevent sparking. From an electrical point of view this system has many good features, as in climbing, the dynamo winding can be put in parallel and the engine run at full speed, while the car travels at about quarter speed with the motors in series and with increased torque at the road wheels.

Details of the Hart-Durtnall System.

In all the systems previously dealt with, as well as those illustrated here, to which no detailed reference is made, continuous current is utilized. In the Hart-Durtnall system, polyphase, alternating-current apparatus is adopted. Chief among the advantages of the induction motor are its powerful starting torque and its freedom from commutator and brush troubles; a burnt-out armature is practically unknown. It also has the advantage of being able to start against load in contrast with the single-phase motor of the same type. As is well known, such a motor consists of but two parts, the stator and the rotor. When running light the speed of the motor is very nearly that of the rotating field produced in the stator or nearly synchronous, a very small current being induced in the rotor winding; its magnetic pole on the rotating field produces a feeble torque, and the current consumption is only that required to overcome the mechanical and magnetic friction of the motor.

The method of varying the voltage is that of changing the number of poles of the stator and so arranging them that, although the periodicity of the supply current remains constant, the motor can turn at quarter, half, or full speed. The result is very similar in action to, though much more flexible than, an ordinary set of change speed gears. Other great advantages are absolute freedom from danger of mechanical injury and the small amount of insulation required on the rotor.

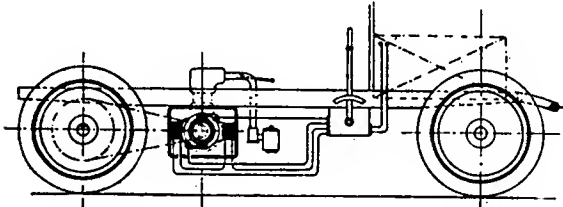
We show, diagrammatically, a general arrangement, in plan and elevation, of the Hart-Durtnall chassis. *A* is a 40-horsepower engine (speed, 800 r. p. m.); *B*, fan; *C*, polyphase, alternating-current generator, combined with a series-wound exciter; *D*, electro-magnetic clutch, to obtain direct drive on top speed (800



WIRING DIAGRAMS: KRIEGER CONSTANT POWER AND HART-DURTNALL CONTINUOUS CURRENT SYSTEMS.

r. p. m. of engine equals 12 m. p. h.); *E*, polyphase, alternating-current, induction motor, coupled by means of—*F*, propeller shaft, fitted with universal compensating joints to—*G*, live back axle, fitted with differential gear, etc.; and *H*, bolts to carry the whole plant, which is slung from the cross members of the chassis.

Other parts shown in the diagram are: *I*, connections; *J*, exciting, revolving field-magnet of polyphase-current generator; *K*, armature of small, continuous-current, series-wound exciter; *L*, sectional field of exciter; *M*, winding of electro-magnetic clutch; *N*, regulating switch and contacts in connection with sectional field; *O*, bridge contact-piece, for short-circuiting generator field;



SIDE ELEVATION CHASSIS OF PIEPER SYSTEM.

P, contacts for bringing into circuit magnetic clutch windings; *Q*, fixed armature winding in polyphase generator; *R*, fixed "stator" two-speed windings; *S*, "rotor" of polyphase motor, with short-circuited bar winding; *T*, bridge contact in connection with the foot-brake pedal; *U*, reversing switch; and *V*, two-speed switch, for starting on gradients.

The method of operation is that, assuming the engine is running at constant speed, the switch is on the forward position, the two-speed switch is on the top electrical driving speed, and the regulating switch is on position 1, no voltage being available, the driver places the switch on No. 2 contact, and a low voltage is generated, which excites the alternator field, which, in turn, generates polyphase alternating current in the generator arma-

ture-winding, from whence it is conducted, by copper bars, through the reverse and two-speed switches to the "stator" winding in the motor, producing a rotating field in the "stator"; the "rotor" then starts and endeavors to get into phase with the speed of the generator. Should the car be loaded, it may be necessary to increase the field of the exciter, in order to get sufficient starting torque at the motor, and this is done easily by bringing the switch round to No. 9 contact; when the speed of the car has risen, direct drive is obtained by moving the switch on to No. 10 contact. This move drops the magnetic clutch winding in series with the field of the generator, weakening this field and, at the same time, brings the clutch over gently into contact; the last move, to No. 11 contact, which is made immediately, causes the insulated bridge-piece to short-circuit the polyphase generator field. It will be observed that the exciter then only supplies current to the magnetic clutch winding, which grips solid, and the direct drive on top speed, from engine to back axle, is obtained, the generator and motor being out of action.

"AUTOGENOUS" WELDING PLANT OPENED.

The Worcester Pressed Steel Company, Worcester, Mass., manufacturers of pressed steel parts for automobiles and similar work, have just installed a plant for autogenous welding with the oxy-acetylene blow pipe flame. This is the only plant of its kind in Worcester, and but the second to be put in operation in this country. The value of such a plant lies in the fact that the oxy-acetylene flame is the hottest known, reaching a temperature of 6,300 F. or 2,700 degrees higher than that attainable with the oxy-hydrogen blow pipe. The gases are used in equal parts at a pressure varying from 15 to 150 pounds to the square inch. The process will be employed in place of riveting and soldering, tank making and other forms of construction hitherto found too difficult with the means available. It will also be used for cutting steel, as with the plow pipe the operator will be able to do work impossible with the saw.

FIRST PNEUMATIC TIRE EXPERIMENTS WERE INTERESTING.

It is curious that the man who first produced a pneumatic tire should have had no connection with the rubber industry, the bicycle trade, or even with any branch of mechanics. J. B. Dunlop was, indeed, a veterinary surgeon practising in Belfast, Ireland. He had at various times given some thought to a new wheel which would reduce vibration, but never put any of his theories into practical form. Towards the end of 1887 the idea came to him of fixing an air cushion around the rim of a wheel, and he mentioned the scheme to his son, who then rode a solid-tired tricycle. The boy, who had experienced the nerve-racking sensation of riding over roughly paved roads and was also anxious to ride faster than his companions, urged his father to experiment the new idea. Dunlop procured a disk of wood about 16 inches in diameter and one and one-half inches thick. He constructed an air tube out of the purest stock sheet rubber one-thirty-second of an inch thick, and inserted in the tube, for the purpose of inflation, a short piece of rubber tubing commonly in use for children's teething bottles, placed the air tube on the periphery of the disk of wood, covered the air tube with a strip of thin linen cloth, and secured the cloth in a temporary manner to the disk of wood by means of small tacks. The tire was inflated by means of a football pump and the tube fastened by means of a piece of thread.

One evening in December, 1887, when the yard gates had been closed the first experiment was made in the presence of Dunlop, his son, an assistant, and a friend who was interested in cycling. First a large solid-tired wheel was thrown towards the gate,

but it did not run the whole length of the yard. The small pneumatic-tire disk was thrown in the same manner. On the first attempt the disk struck the side of the wall; on the second attempt, however, it ran the whole length of the yard, struck the front gate and rebounded with considerable force. Further experiments only showed the superiority of the pneumatic-tired wheel over the solid. After the rolling friction test the wheel was tested for its resiliency. When dropped to the floor from a height of about four feet it was found to rise to nearly the point from which it started. These experiments were explained to R. J. Mecredy in 1889 and about the same time were made known to the public. The first pneumatic-tired safety bicycle was designed with a view to its being ridden at a race meet on a cinder track in England, but was not finished in time for the event.

Judging from an examination of new models, the heavy high-power motorcycle, which a few years ago enjoyed much popularity, has lost favor. Everywhere the medium and light-weight machine is being more extensively adopted. In France there is a momentary boom on the motor-bicycle. Most of this type carry a single cylinder engine entirely within the frame, and when the magneto is used it is placed above the crank case and below the top stay. Other machines of this type have the engine attached by lugs to the forward down stay of the frame, immediately behind the front wheel. The space within the frame is thus left free for gasoline tank, etc.

THEORY OF BRAKE POWER AND ADHERENCE*

YOUR automobile is rolling along at twenty, thirty, or forty miles an hour. Suddenly an obstacle is seen ahead—a cow, a horse, a team leaving the fields—and you have to stop in the shortest space possible. You throw on your brakes desperately, and just avoid an accident which might have been fatal, and which certainly would have been unpleasant. When running home the probability is that you ask yourself if it is not possible to know, even roughly, what is the minimum length in which your car can be pulled up.

To this it may be replied that it is generally possible to know approximately in what length the car can be stopped if the speed of the machine is known at the moment when the maximum braking effect is applied. By maximum braking is meant blocking the wheels, for it is only when the wheels are blocked that the maximum effect is obtained, and consequently a stoppage in the minimum distance. To stop any moving body some power must be brought into action, and there must be a fulcrum. This latter is essential, and no engineer has doubted its necessity since Archimedes first showed us its value. The force is to hand in the shape of the brake lever, but the fulcrum is on the road, and the resistance of this fulcrum is limited in value to the adherence of the brake wheels to the road, or in other words, to the value of the force producing the sliding of the wheels. It is clear that the force with which an automobile can be braked cannot be superior to, though it may equal, the adherence of the brake wheels; this adherence is therefore the superior limit of the braking power. What is the value of this resistance?

The Theory of Braking Effect.

Experience alone can reply to this question, and the answer she gave us two or three years ago was that on a normal road, dry but not dusty, the adherent force of a pneumatic tired wheel was between 63 and 67 per cent. of the force with which the wheel is applied normally to the road, so that the coefficient of adherence with which a pneumatic tired wheel is resting on a given plane is equal on an average to 0.65. This is a value from 40 to 50 per cent. higher than those determined by Morin fifty years ago for metal-shod wheels.

This obtained, a knowledge of the speed of the vehicle at the moment of maximum braking effect and of the coefficient of adherence given above multiplied by the relation of the weight carried by the braking wheels to the total weight, a relation easily obtained by means of a scale, is sufficient to obtain the minimum length corresponding to a complete stop. Mechanics have shown, and experience has confirmed the demonstration, that a moving body weighing P, with a velocity V, has a quantity of work measured by the product FL of the force F by the displacement L of its point of application, and such that there is always equality between the quantities PVF and L:

$$FL = \frac{P V^2}{2 g}$$

in which g designates a constant coefficient equal to 9.81. If the force F acting on the vehicle as a brake is constant, the preceding relation gives us the length

$$L = \frac{P V^2}{2 g F}$$

of the distance necessary to obtain a complete stop. This distance will be proportionate to the square of the velocity and, for a given value of speed, will be in inverse proportion to the braking force F. It has just been shown that this force F has as its maximum limit the product Pa of the weight P of the machine

by the coefficient of adherence a = 0.65. This would thus give for L the value

$$L = \frac{V^2}{2 g a} = \frac{V^2}{2 \cdot 9.81 \cdot 0.65}$$

if all four wheels were blocked. But as only the driving wheels are braked, and as these support generally about half the weight of the vehicle, the preceding relation gives for a stopping distance

$$L = \frac{V^2}{2 \cdot 9.81 \cdot 0.325} = 0.157 V^2$$

of the double values.

It is this last formula which has been used to calculate the following table giving the minimum length of stopping, corresponding to the different speeds of the automobile.

TABLE INDICATING MINIMUM LENGTH AND TIME IN WHICH AN AUTOMOBILE CAN BE STOPPED.

SPEED PER SECOND		SPEED PER HOUR		DISTANCE		DURATION
Meters	Yards	Kilometres	Miles	Meters	Yards	Seconds
1	1.093	3.6	2.236	0.157	0.171	0.31
2	2.187	7.2	4.473	0.628	0.686	0.63
3	3.280	10.8	6.710	1.413	1.545	0.94
4	4.374	14.4	8.947	2.51	2.745	1.25
5	5.468	18	11.184	3.93	4.297	1.57
6	6.561	21.6	13.421	5.65	6.179	1.88
7	7.655	25.2	15.658	7.69	8.410	2.20
8	8.749	28.8	17.895	10.04	10.980	2.51
9	9.842	32.4	20.132	12.72	13.811	2.83
10	10.936	36	22.369	15.70	17.170	3.14
15	16.404	54	33.554	35.37	38.683	4.71
20	21.872	72	44.739	50.80	55.558	6.28
25	27.340	90	55.924	68.125	73.886	7.85
30	32.808	108	67.109	94.130	102.516	9.42

The duration T of this distance, easily calculated by the known relation

$$F T = \frac{P V}{g}$$

existing between a propulsion F T produced by a constant force F acting during time T on a moving body weighing P, to which it communicates or reduces to zero the speed V. In the present case we have T for the duration of the stopping distance.

$$T = \frac{V}{g \cdot a} = \frac{V}{9.81 \cdot 0.325} = 0.314 V$$

To sum up, if the distance corresponding to the complete stoppage of the automobile is proportionate to the square of the speed of the vehicle, on the other hand its duration is simply proportionate to this speed. To be absolutely correct we ought to have taken into account atmospheric resistance, which naturally tends to reduce the length of the stopping distance; but this has not been done because calculation has shown that its action was felt at the commencement of the braking effect, and would only very slightly modify the results of the preceding table in the practical limits in which we have considered the question.

AUTOMOBILES IN POLAR EXPEDITIONS.

The automobile will play an important part in scientific expeditions to the Polar regions this year. Walter Wellman, who is now fitting out in Paris for a dash to the North Pole, has had a special automobile constructed at the De Bion Bouton factory, to be used in the final dash to the pole. The British expedition to the South Pole under the command of E. H. Shackleton, who was third lieutenant on the *Discovery* on its expedition to the Antarctic, will also be supplied with an automobile specially designed for ice travel.

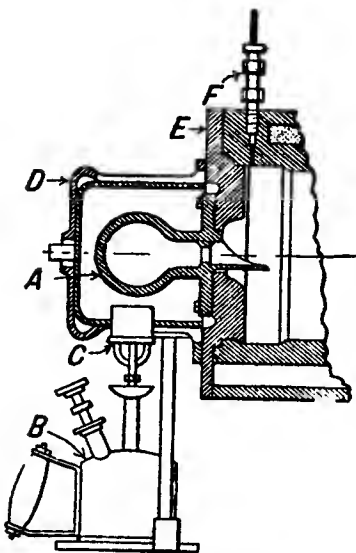
*By René Arnoux, Vice-president Technical Commission A. C. of France. Translated from *Omnia*, by W. F. Bradley.

USE OF ALCOHOL AND GASOLINE IN FARM ENGINES*

By CHARLES EDWARD LUCKE, M.S., Ph.D., AND S. M. WOODWARD, M.S., M.A.

THE determination of the position of the alcohol engine today involves a forecast of the future, and should it be shown to be able to compete now it must inevitably reach a stronger and more important industrial position as time goes on. This is the fact that has led governments to take up the question, and among them the United States is the latest. Exploding engines operating on crude oil will average about 25,000 heat units per brake horsepower hour, which is equivalent to about 10 per cent. thermal efficiency; engines using gasoline should operate at a thermal efficiency of about 19 per cent. under similar operating conditions.

The efficiency of an alcohol engine may be assumed at this time to be unknown, but as alcohol can be burned in engines designed for gasoline, it may be assumed that such an engine will have with alcohol fuel the same thermal efficiency as with gasoline.



MEITZ & WEISS KEROSENE VAPORIZER.

The first serious attempt to examine into the possibility of alcohol as a fuel in competition with petroleum seems to have been made in 1894 in Leipzig, Germany, by Professor Hartman. The engine used was built to operate on kerosene, and used 425 grams of kerosene per hour per brake horsepower, which is equivalent to 0.935 pounds, or 1.1 pints, approximately. This indicates for kerosene a thermal efficiency of 13.6 per cent. When operating on alcohol the engine used about twice as much, or 839 grams, which with this kind of alcohol was equivalent to a thermal efficiency of 12.2 per cent., or a little less than with kerosene. This experiment would seem to indicate that, compared with kerosene, alcohol, as a fuel, offered very little chance for successful competition. In spite of this, investigations were continued and the results of this development may be summed up by stating that the thermal efficiency has been raised to something over 30 per cent.—quite a remarkable showing, in comparison with the original figure. This indicates that with a motor specially constructed for alcohol, the price per gallon might be twice as much for the latter as for petroleum, and still produce power for less money, assuming all other conditions, such as cost of attendance, lubrication, etc., being the same.

Results of Government Tests.

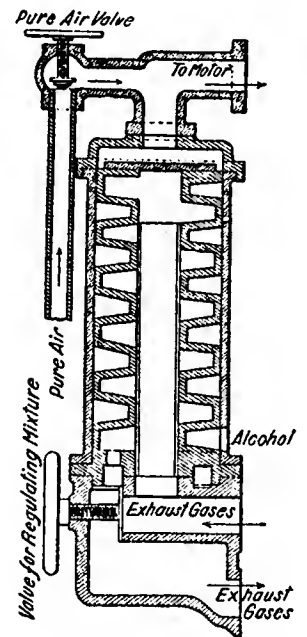
The Office of Experiment Stations of this Department, in connection with its Irrigation and Drainage Investigations, has tested a number of different types of gasoline engines with alcohol and obtained figures which show the comparative consumption of gasoline and alcohol in the same engine. The first tests were made without any particular attempt at obtaining the best adjustment of the engine for each fuel, and showed a consumption of alcohol two to three times as great by weight per horsepower hour as was necessary with gasoline or kerosene. These figures indicate the necessity or desirability of determining the proper conditions of adjustment, because these were found to have a serious influence on the amount of fuel consumed. With care in adjusting the engine so as to secure the most

economical use of the alcohol, it was found that, under like conditions, a small engine consumed 1.23 pounds of alcohol to 0.69 pound of gasoline per brake horsepower hour—that is, with the best adjustment of the engine for each fuel there was required 1.8 times as much alcohol by weight as gasoline per brake horsepower hour. It was also shown in making this adjustment that it was possible to burn more than twice as much alcohol as stated, by improper adjustments, and still have the engine working in an apparently satisfactory way. The range of excess gasoline which might be burned without interfering seriously with the working of the engine was not so great, being a little less than twice as much as the minimum.

Special Vaporizers Employed.

There is on the American market a class of engines having a vaporizer which forms part of the cylinder head and which is heated by the explosions taking place inside the exploding chamber. One of these is shown in Fig. 7. On this figure, A is the vaporizer proper. Under it is seen a lamp (B), the burner and vaporizer being surrounded by a casing (D). This vaporizer is bolted to the cylinder head (E), and contains on its inner end a lip projecting into the exploding chamber. A little pump injects a small stream of oil at every stroke and drops it on this lip from the pipe (F). This lip is very hot from previous explosions and from the lamp, which is turned off when the engine begins work. The compression stroke forces the air in the cylinder over the lip and through the neck into the vaporizer bulb, thus mixing more or less completely the vapor which forms on the lip with the air that is forced over the lip into the bulb. Such hot-bulb vaporizers as this will work with practically all of the fuels—crude oils, gasoline, kerosene, and alcohol—with proper adjustments of the pump and of the temperature of the receiving bulb.

Another vaporizer of a similar order, but designed especially for alcohol, illustrated in Fig. 8, is known as the Brouhot, a French type. Exhaust gas enters at the bottom, as shown by the arrow and lettering on the cut, and rises through the iron chamber, which is corrugated to increase the surface. Alcohol is admitted near the bottom of these ribs, and flows upward on the side opposite to that heated by the exhaust gases. The regulating valve is attached to permit some exhaust gases to pass around the heating chamber and so vary its temperature, but the regulation must be done by hand. Vapor rising from the surface of the alcohol in the top of the chamber meets air, which passes first through the regulating valve intended for the adjustment of proportions. The corrugations are such as to form a screw thread or a helix passage, and the exhaust entering first at the bottom, passes directly to the top of the chamber and downward in the helical groove to the bottom, so that the top of the helix will be the hottest part. Alcohol enters the bottom of the opposite helix, flows upward and vaporizes somewhere in its upward course, discharging into the air current at the hot top of the helix as superheated alcohol vapor. This vaporizer is,



BROUHOT ALCOHOL VAPORIZER.

*Extract from Bulletin No. 277, U. S. Department of Agriculture.

therefore, of the boiling type, but the boiling takes place on the surface of the liquid which is at the pressure in the suction pipe, and the rate of boiling is regulated by hand by admitting more or less exhaust gases to the vaporizing helix.

Separate vaporizers as distinguished from carbureters are essential for kerosene and common for alcohol. They have been described at this point because the principles of their operation are simpler than those of carbureters, and they are less numerous and less representative. Carburetion is a process distinctly different from boiling. Air may take up the vapor of a liquid just as it takes up the vapor of water, even when the temperature of the liquid or the temperature of the air is very considerably less than the boiling point of the liquid. * * *

Conclusions.

The following conclusions regarding the use of alcohol as fuel for engines as compared with gasoline are based on the preliminary results of the Department's experiments, upon results of the European experiments and investigations which have been presented in the foregoing pages, and upon the general knowledge of the authors:

- (1) Any engine on the American market to-day, operating with gasoline or kerosene, can operate with alcohol fuel without any structural change whatever with proper manipulation.
- (2) Alcohol contains approximately 0.6 of the heating value of gasoline, by weight, and in the Department's experiments a small engine required 1.8 times as much alcohol as gasoline per horsepower hour. This corresponds very closely with the relative heating value of the fuels, indicating practically the same thermal efficiency with the two when vaporization is complete.
- (3) In some cases carbureters designed for gasoline do not vaporize all the alcohol supplied, and in such cases the excess of alcohol consumed is greater than indicated above.
- (4) The absolute excess of alcohol consumed over gasoline or kerosene will be reduced by such changes as will increase the thermal efficiency of the engine.
- (5) The thermal efficiency of these engines can be improved when they are to be operated by alcohol, first by altering the con-

struction of the carbureter to accomplish complete vaporization, and, second, by increasing the compression very materially.

(6) An engine designed for gasoline or kerosene can, without any material alterations to adapt it to alcohol, give slightly more power (about 10 per cent.) than when operated with gasoline or kerosene, but this increase is at the expense of greater consumption of fuel. By alterations designed to adapt the engine to new fuel, this excess of power may be increased to about 20 per cent.

(7) Because of the increased output without corresponding increase in size, alcohol engines should sell for less per horsepower than gasoline or kerosene engines of the same class.

(8) The different designs of gasoline or kerosene engines are not equally well adapted to the burning of alcohol, though all may burn it with a fair degree of success.

(9) Storage of alcohol and its use in engines is much less dangerous than that of gasoline.

(10) The exhaust from an alcohol engine is less likely to be offensive, although there will be some odor, due to lubricating oil and imperfect combustion, if the engine is not skillfully operated.

(11) It requires no more skill to operate an alcohol engine than one intended for gasoline or kerosene.

(12) There is no reason to suppose that the cost of repairs and lubrication will be any greater for an alcohol engine.

(13) There seems to be no tendency for the interior of an alcohol engine to become sooty.

(14) With proper manipulation, there seems to be no undue corrosion of the interior due to the use of alcohol.

(15) The fact that the exhaust from the alcohol engine is not as hot as that from gasoline and kerosene engines seems to indicate that there will be less danger from fire and less possibility of burning the lubricating oil. This is also borne out by the fact that the exhaust shows less smokiness.

(16) In localities where there is a supply of cheap raw material for the manufacture of denatured alcohol, and which are remote from the source of supply of gasoline, alcohol may immediately compete with gasoline as a fuel for engines.

(17) If, as time goes on, kerosene and its distillates become scarcer and dearer, the alcohol engine will become a stronger and stronger competitor, with a possibility that in time it may entirely supplant the kerosene and gasoline engines.

(18) By reason of its greater safety and its adaptability to the work, alcohol should immediately supplant gasoline for use in boats.

(19) By reason of cleanliness in handling the fuel, and increased safety in fuel storage, alcohol engines will, in part, displace gasoline engines for automobile work, but only when cost of fuel is a subordinate consideration. In this field it is impossible to conveniently increase the compression because of starting difficulties, so that the efficiency cannot be improved as conveniently as in other types of engines.

(20) In most localities it is unlikely that alcohol power will be cheaper or as cheap as gasoline power for some time to come.



SERVICE TEST OF A FINISHED CADILLAC CAR IN THE SNOW-CLAD MICHIGAN WOODS.

The thermometer was at zero, and the road, or path, had not been traveled in weeks. The machine, a four-cylinder Model G, had to make its way through a heavy snow on the level and great drifts in places. No chain grips were used, the car going satisfactorily without.

LETTERS INTERESTING AND INSTRUCTIVE

Correcting a Faulty Steering Gear.

Editor THE AUTOMOBILE:

[611.]—Will you please answer the following through your valuable journal:

(1) I have a touring car which has a defective steering gear. It is of the irreversible design (worm and segment), and will only turn the front wheels half as far one way as the other. They will turn to the left all right, but will only turn to the right a very small distance. The car came to me new this way. I can see only one way to remedy it, and that is to bend the arm on the steering knuckle where the connecting rod from the segment arm fastens. Can you give me an idea as to how I can adjust it, as it makes steering very inconvenient?

(2) What damage would be done to the coil if too large a current is supplied to it? How many dry cells would you recommend for the best results?

(3) When one's home city does not require an owner to carry a number on his car, what requirements would it be necessary for him to follow if he should wish to operate his car or pass through some city which requires registration? A SUBSCRIBER.
Ankenytown, O.

Such a state of affairs as you describe in the first part of your letter would appear to constitute a strange oversight on the part of the factory that shipped you the car. It would appear that in assembling the steering gear, the segment was left much too far one way or the other from the center of its travel on the worm, so that as you say it has more than sufficient movement in one direction but not enough in the other. Such a car would be very dangerous to drive, and if just received new, probably the best thing to do would be to advise the maker and have him correct it. If you wish to remedy it yourself, disconnect the steering gear and take it down. See if there is anything else wrong with it other than that indicated above, and if not, turn the wheel until the segment is exactly at the center of its range of travel on the worm; that is, so that moving the wheel one way or the other will cause the same amount of movement at the lever in either direction. It may be found on dismantling the gear that something has become deranged, and that the trouble is not due to faulty assembling, but if such is not the case, centering the segment on the worm, and then after accurately centering the front wheels, reconnecting in that position, should remedy the difficulty. We should not recommend such a makeshift as bending the arm on the steering knuckle.

(2) The insulation of the secondary is apt to be broken down, either partly or wholly, by the discharge breaking through the insulation and jumping from layer to layer, thus greatly reducing or totally destroying its efficiency.

(3) It will be necessary to register in accordance with the law of the State which you wish to enter; cities in the same State very seldom have local enactments in force regarding registration, but where such is the case, it would probably also be necessary to register in such city.

Percentage of Heat Losses in Air-Cooled Motors.

Editor THE AUTOMOBILE:

[612.]—I wish to thank you for your answer to my proposition submitted some time ago concerning the relative power of an air and water-cooled motor of the same size, though I have as yet been unable to convince my friend who held the other end of the argument that I am right. If there is any accurate means of ascertaining exactly the percentage of the heat losses in engines of the air-cooled type, and this can be done, would an article on the subject be available for publication in the columns of "The Automobile"?
SIDNEY BARRETT.

Carteret, N. J.

If you have made any scientific tests with a view to determining the exact percentage of heat losses in air-cooled motors, we would be pleased to have you submit an article setting forth the nature of your experiments as well as the data resulting therefrom. After seeing it we can tell you whether it will be available for publication in the columns of THE AUTOMOBILE or not.

Information Asked on Many Points.

Editor THE AUTOMOBILE:

[613.]—Will you kindly answer the following questions under the head of Letters Interesting and Instructive and oblige.

(1) An automobile owned in a State which has no registration or license law is used temporarily by its owner in another State which does have a registration or license law. Is it subject to the automobile law of such last-named State? How is it, suppose the visiting car is used in the latter State merely on a continuous journey from one to or through the other?

(2) So long as a machine will actually climb a given grade on the high gears, is there any disadvantage to the machine in using them, instead of lower ones?

(3) Scientifically, how much more resilient is a pneumatic tire, with as small an air-space as those which use the heaviest fabric and rubber, than a solid rubber tire? If two solids and two pneumatics were to be used on a touring car, where should they properly be put to get the best results?

(4) Owners seem to be recommended on all hands to use large tires. Is there not an actual limit to the size of tire that can be used advantageously on a given rim? If so, what is the limit? Assume a standard clincher rim 2 1-2 inches wide, and what is the largest tire that can properly be used on it?

(5) In comparing the resiliency of solid and pneumatic tires, what is your opinion as to the difference between unaided pneumatics and solids used with a standard shock-absorber?

Cambridge, O.

GREENHORN.

(1) In the majority of States which have passed legislation on the subject, excepting those which go to radical and unreasonable extremes, such as New Jersey and Pennsylvania, non-resident owners of cars are exempted from the provisions of the statute, either altogether, as in New York, or for a limited period; as, for instance, 48 hours in Delaware and 15 days in Connecticut. But in practically every case, this exemption is conditioned upon such non-resident having complied with the laws of his home State in this regard, which means that he must display the registration number taken out there. A statute that has probably served as a model for the majority in this respect is that of New York, subdivision 9 of which reads as follows: "The provisions of this section (regarding registration and display of number) shall not apply to motor vehicles owned by non-residents of this State, provided the owners thereof have complied with any law requiring the registration of owners of motor vehicles in force in the State, etc., of their residence, and the registration number showing the initial of such State shall be displayed on such vehicle substantially as in this section provided." Michigan makes this exemption depend upon the granting of similar privileges by the State from which such non-resident hails, so that an autoist from Jersey or Pennsylvania could not travel in Michigan without registering in the latter. Though not explicitly so stated, the inference is unavoidable that an autoist hailing from a State having no legislation on the subject, would be compelled to register in the first State he entered that had such a law, and that such registration would then serve him in every other State except such as ignored the demands of comity.

(2) The mere fact that a car can be nursed or forced over a grade on the high-gear is far from constituting a reason why this should be done. The chief object of the provision of various ratios of gearing is to enable the motor to be run as nearly as possible at the speed at which it develops its maximum torque, and a skillful driver will shift gears as frequently as it is necessary to maintain this. By permitting the motor to labor and thump, many a car can drag itself over comparatively steep hills on the high gear, but it is absolutely injurious to the motor to treat it in such fashion, and shows little or no knowledge of the elements of either mechanics or driving. Gears should be shifted as soon as the motor slows down unduly, not waiting until it is about to gasp its last and then racing it as is so frequently done.

(3) So far as we know, while there is no data extant regarding the first part of your third question, there can be no com-

parison between any solid rubber tire and the heaviest pneumatics, as the air space is always proportionate to the size, regardless of the weight of the fabric or rubber. Reducing the air space would, of course, have the effect of reducing the resiliency of the tire. In using tires of both types on the same car, the solids would be put on the driving wheels.

(4) Rim sizes increase proportionately with tire sizes, and one must be adapted to the other in order to be used advantageously. For instance, the smallest tires made, which are 26 by 2 1-2 inches, take a rim 1 3-8 inches wide; a 4-inch tire takes a 2-inch rim; a 4 1-2-inch tire a 2 1-4-inch rim, so that the size tire that would give best service on a 2 1-2-inch rim would be a 5-inch. It is axiomatic that the larger the tire, the greater must be the size of its retaining beads (clincher type), and the rim must be enlarged correspondingly to accommodate them. In consequence, there is always a limit to the size of tire that can be used advantageously on a given rim, but there is nothing to prevent increasing the size of the rim. This subject was gone into at length in THE AUTOMOBILE of August 9, 1906, pp. 169-173.

(5) Concerning your last question, we should say that the unaided pneumatics would be superior to solid tires with shock absorbers, the office of the latter being more as an aid to the springs than to the tires. The limit of the resiliency of the solid tire is reached in absorbing what has been euphroniously christened "dither"; that is, vibration. Between this and the hard jolts which the shock-absorber is designed to take care of, there is a vast amount of bumping and jolting that only the pneumatic tire can efficiently cope with.

Why There Is No Danger from Backfire.

Editor THE AUTOMOBILE:

[614.]—I notice in the issue of "The Automobile" of February 21, under the head of "Letters Interesting and Instructive," letter No. 582, a question was asked reading as follows:

"We have had trouble from flashes of fire coming from the carbureter when the motor is running."

Will you kindly let me know through your columns how it is that fire can flash from a carbureter without causing a serious explosion of the mixture, and oblige a three-years' reader of your paper.

New York City.

J. E. R. H.

The reason for the non-occurrence of either an explosion or the ignition of the contents of the float chamber of the carbureter, when by reason of a back fire through the carbureter flame is seen to issue from it, is due to the fact that there is nothing to support combustion there. Any mixture that might be in the body of the carbureter itself would be entirely too rich to explode, while the float chamber would, in all probability, be filled with almost pure gasoline vapor, and the latter cannot burn without oxygen. About the only point at which ignition would be apt to take place would be at the spray nozzle, of the spraying gasoline as it issued, and while there would probably be sufficient oxygen at that point to maintain a flame in a quiescent state, with the motor running, the suction would doubtless be so strong as to blow it out every time.

Why Is the Two-cycle Motor Not More Popular?

Editor THE AUTOMOBILE:

[615.]—What is the two-cycle motor? Is it practical for automobile uses? I see one concern manufactures it, and if it's such a good thing, why don't some of the hundreds of other manufacturers in Europe and America make it?

INQUIRER.

Oil City, Pa.

The two-cycle, or more properly speaking, the two-part cycle motor, is a type in which, as its name indicates, there are but two parts to the cycle, so that there is an impulse given the piston every revolution, instead of every other revolution, as in the four-cycle. The induction and compression strokes of the four-cycle motor are combined in one, as are also the firing and exhaust strokes. To accomplish this the mixture is drawn into the crankcase, made airtight for the purpose, and delivered to the compression chamber of the cylinder through a bypass and

port opened by the piston itself; another port, similarly operated, permitting the escape of the exhaust. For a more detailed explanation of the two-cycle motor we would refer you to the articles that have been published in the columns of THE AUTOMOBILE during the past year. While there is but one firm that builds automobiles with two-cycle motors in this country, there are probably a score or more who have been building two-cycle marine motors for quite a few years, and their output is large. The fact that the firm in question has been building cars successfully for the past six years or more would appear to answer your query regarding its use on the automobile, in the affirmative. There are also one or two firms on the other side who have built two-cycle automobile motors, but not to any extent. Probably the chief reason why more have not taken it up is because they do not regard it as having yet reached a stage where it can compete with the four-cycle, though a discussion of the various pros and cons is not possible here.

Many Readers Quick to Detect Error.

Editor THE AUTOMOBILE:

[616.]—I would like to ask what proof you can offer of the statement made in answer to question No. 585 that a vertical line represents a 45 per cent. grade?

H. L. HORNING.

Waukesha, Wis.

Editor THE AUTOMOBILE:

[616A.]—On page 356 of your current number, in reply to letter No. 585, you say: "Bearing in mind the fact that a 45 per cent. grade" "represents a vertical line." Is this correct? Isn't a 100 per cent. grade exactly 45 degrees, and doesn't infinity per cent. grade represent a vertical line? I am of the impression that the steepest place in Eagle Rock Hill is about 17 per cent., and in Jacob's Ladder about 20 per cent.

"GASOLINE SAL."

New York City.

Editor THE AUTOMOBILE:

[617.]—Referring to your answer to inquiry No. 585, I should be pleased to know how you arrive at the conclusion that a "45 per cent. grade represents a vertical line." We have always supposed that the number of feet rise per 100 feet horizontal distance gives the per cent. of a grade. That is, a 100 per cent. grade makes an angle of 45 degrees with the horizontal. Is this understanding correct?

H. H. F.

Galion, O.

Editor THE AUTOMOBILE:

[618.]—I wish to correct a statement which you made in your answer to letter No. 585, issue of February 21. You say: "Bearing in mind the fact that a 45 per cent. grade is represented by a vertical line." This must have been a mistake, for a little further on in the same article you say a grade of 1 in 9 equals 10 per cent. or 11 per cent. nearly; following out this line of reasoning we come to a rise of 1 foot in 1 foot making 100 per cent. grade, and also makes an angle of 45 degrees with the horizontal. A vertical line represents a grade which is infinite, but is 90 per cent. to the horizontal. I have seen automobiles climb a 40 per cent. grade on smooth wooden boards for the grade, Jacob's Ladder, of which you speak, has an average grade of 25 per cent., but has a maximum of 31 per cent., which is quite a little in excess of your figures.

This subject of grades in per cents. and degrees seems to be pretty poorly understood by the automobile public, as well as the trade, and I would suggest your publishing in the near future the rough rules for computing the different gradients.

West Medford, Mass.

EVERETT H. SHEPARD.

Editor THE AUTOMOBILE:

[619.]—Are you not mixed up in your statements about grades in your answer to question No. 585, issue of February 21? How can a 45 per cent. grade represent a vertical line? In steam railroad practice the grade of the track is usually described in feet per mile, but in street railroad practice, where much steeper grades are used, it is usually described in feet per hundred, or, what is the same thing, by a percentage. For instance, if a stretch of track 100 feet long is 2 feet higher at one end than at the other, its grade is called a 2 per cent. grade; and, in the same way, if the track rises 10 feet in running a distance of 100 feet, it would be a 10 per cent. grade. Now, on the above basis, a 50 per cent. grade would only be about one-quarter of the way to the vertical, a 100 per cent. grade just half way, and, if I remember my trigonometry, the grade percentage of a vertical line would be infinity.

I thought at first you might have confused the angle of the rise from the horizontal with the percentage of grade, but you evidently have not, for a 45 per cent. angle is only half way to the vertical, a right angle being 90 degrees, of course. I think I have

seen photographs of automobiles climbing wooden inclined planes at an angle of 45 degrees, and I am sure that when I took my runabout up an inclined plane to the second story of a paint shop the other day, we went up a grade that was at least 25 per cent., with plenty of power to spare.

If there is any misunderstanding as to what the percentage of a grade means, I think it important that you should have an article in your valuable paper on the subject.

Hartford, Conn.

ARTHUR PERKINS.

The statement regarding grade percentages and the manner in which they are figured, to which the foregoing correspondents take exception, was an inadvertent error that was so palpably wrong that it is little wonder it has attracted so much attention. It should have been stated, of course, that a 45 degree angle represented a 100 per cent. grade, as was explained in the following issue of THE AUTOMOBILE. It is gratifying to note, however, how closely the inquiries and answers to correspondents are followed, as the paper scarcely had time to be in the hands of subscribers before letters were received taking exception to the above.

How to Find Horsepower Ratings.

Editor THE AUTOMOBILE:

[620.]—Will you kindly advise me how to find the power of two, four and six-cylinder automobile engines, and also what is the reason for the varying rating in the case of different makes. For example, take the Rambler four-cylinder car; it has a larger cylinder than the Maxwell four-cylinder, but a smaller power rating, namely 35 horsepower.

GEORGE W. BARLOW.

Mahanoy City, Pa.

There is an endless number of formulæ for ascertaining the power of an engine, but there is no good reason to believe that any of them have superseded the old standard used for so many years in calculating the power of steam engines. This is expressed

$$\text{Horsepower} = \frac{P L A N}{33,000}$$

in which P equals the mean effective pressure throughout the working stroke in pounds per square inch, L the travel of the piston in linear feet, and A the area of the piston in square inches, while N represents the number of working strokes per minute. The only difference between this and the same formula as used for the steam engine is in the equivalent of N, which represents revolutions per minute in the latter case. From this you will see that there are a number of factors beside the size of the cylinder upon which the horsepower of the motor depends. The horsepower of a multicylinder motor may be ascertained most readily by finding the output of one cylinder and multiplying by the number used. It must be borne in mind that the mean effective pressure referred to does not mean the compression, though the latter, of course, has a strong bearing on it. It means the average pressure in pounds per square inch exerted on the head of the piston from the moment of ignition to the end of the stroke, and is generally calculated with the aid of a planimeter from indicator cards of the engine tested.

Engines Run by Inflammable Dust.

Editor THE AUTOMOBILE:

[621.]—In a foreign periodical I read the other day a reference to some experimental engine that was said to burn coal dust. No details of construction were given, and I am interested to know something of them. Is anything of the kind really practical, and just how does it work? I understand that the dust is burned inside of the cylinder, as is the case with the fuel of any internal-combustion engine.

F. W. WALLACE.

Temple, Tex.

In Germany, a good deal of experimental and development work has been done along the line you suggest, and it is perhaps quite within the bounds of possibility that at some time in the future dust engines may be developed to a high degree of efficiency and serviceability. All there is to the idea is that of making an explosive mixture of air and of some impalpable fuel dust. It has long been known that such mixtures explode upon ignition. If there were any doubt upon this score,

the common occurrence of dust explosions in coal mines and in flour and cotton mills would be conclusive. Apparently, any substance capable of being burned in the air will, if reduced to small enough particles and diffused throughout a mass of air, undergo upon ignition a rapid combustion that is practically explosive in character. Probably certain proportions of mixture are required, as in the case of liquid and gaseous fuels, but the only other conditions to be observed are those of having the diffusion equal and the fuel particles small enough. For a few cents you can buy at any drug store a quantity of lycopodium powder—the resinous spores of a sort of moss-like plant—which will flash like powder if thrown into the air and lit with a match, illustrating the principle involved in a very interesting manner. Of course, in making a really reliable engine to operate on this principle, there are a number of serious difficulties in the way. The abrasive effect of the fuel or its ashes is likely to cause serious scoring of cylinder walls, unless kept off or quickly removed from them, while the problem of infallibly securing properly-measured and compounded fuel charges is one that might well make the present-day carburetor problem seem simple. The best results so far secured have been with vertical two-cycle engines, which possess the double advantage of keeping the fuel away from the walls as much as possible, while at the same time running the succession of charges through in a constant direction—in such a way that there is less chance of fouling than would exist with a four-cycle construction, in which the functioning involves to-and-fro travel of the gases. Attempts also have been made to stratify the charges, surrounding a central core of combustible mixture with wall-protecting zones of air.

Why Gasoline Motors Are Not Double-Acting.

Editor THE AUTOMOBILE:

[622.]—Will you kindly advise me why gasoline motors do not take their power from both ends of cylinder, same as steam engines; and why can they not be built the same as steam engines?

BURTON D. GIBBS.

North Blandford, Mass.

Editor THE AUTOMOBILE:

[623.]—In the building of gasoline engines why are not the cylinders made in the same way as on the steam engine? That is, why is the impulse or active stroke confined to one side of the piston? Why should gas not be admitted on both sides of the piston so as to drive in both directions, as is done in the case of the steam engine?

W. M. GEORGE.

Dexter, O.

The chief reason for not building gasoline engines of the double-acting type, as is done in the case of the steam engine, arises from the necessity of cooling the piston and piston rod and the attendant complication, when an explosion occurs on each side of the piston. It is not at all unusual to build double-acting gas engines, but their use is confined to stationary units and they are usually of comparatively large powers. The Standard 300-horsepower, six-cylinder marine motor is double-acting, as is the Nurnberg engine, a stationary type having two double-acting cylinders placed tandem.

A Doubtful Way of Improving a Car.

Editor THE AUTOMOBILE:

[624.]—I have a 1905 four-cylinder Autocar, and, as the tonneau is detachable, I expect to use it this season as a runabout, and my object in writing you is to find if reducing the wheelbase, which is 96 inches, to say 80 inches, by cutting off the rear end of the car and moving the rear axle forward, also cutting the driving shaft, would reduce the weight and increase the power enough to make the expense worth while?

The car is equipped with Hartford shock absorbers, so the shortening would not affect the riding qualities very much, and I would also remove a leaf from the rear springs.

Kindly let me know your ideas on the above.

New York City.

RICHARD A. STREIT.

The changes you mention in your letter would undoubtedly lighten the car considerably, but whether they would be beneficial or not is quite another matter. Regardless of how much you shorten the car and its wheelbase, the power will not be in-

creased, though we presume, by this statement, you mean that the horsepower with regard to the weight will be greater than previously. If the car is not greatly underpowered, the removal of the tonneau alone should prove sufficient to make it as powerful and speedy as a car of its size can reasonably be expected to be. A wheelbase of 96 inches is not excessive for a runabout, and the work and expense involved in reducing it a matter of 16 inches would be a doubtful investment. We certainly should not recommend it on the score of improving the running or riding qualities of the car. If the rear springs prove too stiff, the expedient of removing a leaf might be tried, but it would be better to leave them as they are until experience has shown the necessity of a change. Making the alterations mentioned would also prevent ever using the chassis with the touring body again.

A Difficult Problem.

Editor THE AUTOMOBILE:

[625.]—Will you kindly tell me, through the columns of your paper, how much compression I want, how fast should I run my engine to get good results, and what size sprockets do I need? I have a single-cylinder, 4 3/4" x 6" planetary transmission, 28-inch wheels. The car weighs about 1,500 pounds.

Andover, Ohio.

MYRLE SARGENT.

It is absolutely impossible for us to give an intelligent answer to your question, with the meager data you give as a line upon your requirements. You do not even say how fast you expect the car to run, which makes it utterly out of the question for anyone to attempt to supply satisfactory information concerning sprocket sizes, compression, etc. Upon receipt of fuller particulars we will be pleased to give you the desired information.

SUGGESTIONS FOR A PUZZLED SUBSCRIBER.

Editor THE AUTOMOBILE:

[626.]—An inquiry in your issue of January 10 has been called to my attention, and, as it is of an unusual character and it is possible that the right answer is still to come, I take the liberty of offering a suggestion at this late date. The item is headed "An Easy One, and Then a Hard One" (529), and is signed "A Subscriber," Bayside, N. Y.

Inquirer's motor is certainly behaving very queerly, and few "experts" would venture to say for sure why it works intermittently. The writer hopes, however, to at least start a line of investigation that will locate the guilty apparatus. I should first make sure the exhaust valves are not "hung up" to some extent, when a certain temperature is reached in each cylinder—one after the other quitting and staying out till temperature comes down.

Next, see that ignition spark mechanism is not so near its limit as to fail to spark inside of cylinder, as one by one their temperature and resistance become greater—such action as described being far more likely to occur in make-and-break ignition than with jump-spark. With former system the contacts are liable to stick and fail to operate at high temperature. With jump-spark the intervals of inaction would be very short, as internal temperature would fall rapidly after miss-firing. These details being found in order, I should then investigate the carbureter, and undertake to find out if the continuous, wide-open suction draws an excess of fuel into air passages, and eventually causes the miss-firing, cylinders quitting in the order of least ignition efficiency. The laying down of some cylinders of course results in a slow-down, and reduced fuel supply ratio, which soon restores the mixture, and allows other cylinders to resume operations.

It is likely that "Subscriber" will be able to readily prove out the suggestions above, but we will be pleased to suggest means of doing so if he makes written inquiry of us direct. We hope he finds the correct solution of the problem, and will appreciate the favor if he mails us a postal card informing us of the same.

THE R. E. HARDY CO.

New York City.

By F. J. Watt.

PISTON VALVES STILL A PERTINENT TOPIC.

Editor THE AUTOMOBILE:

[627.]—In answer to Mr. Malcolm's reply to my letter, I always thought Mr. Malcolm to be deeply interested in the development of the two-cycle engine, and a man who has had considerable experience. But it is clearly seen by his prejudice against the piston valve that his experience in this line has been very limited, or conducted on a wrong principle. I think Mr. Malcolm would be able to see the advantage of this particular construction if

he was not so influenced by his prejudice against the piston valve, and would probably think it worth while to start a discussion on the matter if his knowledge on the subject were a little broader. I would like very much to know if he ever constructed a two-cycle engine of any design that would throttle or run as slow as 100 revolutions per minute without missing. If so, where can it be seen in operation? Mr. Malcolm states that the only excuse for using the piston valve is for the purpose of locating it in a place of small cubic capacity in order to retain and keep the charge separated from the burned gases when the engine is throttled and running light. He also states that my construction will not permit of this. Now, where does he get his authority for making such a statement when he has seen neither one of my engines nor a working drawing? I would like to inform him that this is only one of my reasons for using check valves, and if he will give the principle a little study he will find several other advantages that cannot be accomplished in any other design.

These statements made by Mr. Malcolm are purely theoretical. Now for the actual facts from experience on my part. If the results mentioned by Mr. Malcolm as "being impossible in my engine" are not obtained in an engine that will throttle to 100 revolutions per minute running empty and slower when loaded, then they are not beneficial. I now have in operation, where anyone may see it, a four-cylinder two-cycle motor, built on the principle shown in my first article. Cylinder, 4-inch bore 3 1/2-inch stroke. Weight of complete engine, 200 pounds (no attempt being made at extreme lightness). Weight of flywheel, 25 pounds. This engine will throttle down to 100 revolutions per minute, empty, and continue to run at this speed any length of time without missing an explosion. It will respond instantly on opening the throttle. It will run as fast as 2,500 revolutions per minute without missing. This certainly contradicts Mr. Malcolm's statement that the valve would refuse to lift if engine were running very fast. This engine develops 30-horsepower at 1,200 revolutions per minute by Prony brake test.

Mr. Malcolm makes some very erratic statements in his letter replying to Mr. Miller. He says that the two-cycle engine has no positive means of introducing the fresh gas or expelling the burned gases. Now, if he will forget his prejudice long enough to give my sketch a little study, he will see that the charge is introduced just as positively as in a four-cycle engine, or more so if there is any difference. Now these gases being positively introduced will just as positively drive out the burned gases before it, and do it with less loss (and less mixing of the fresh gas with the burned), than in any engine introducing the fresh charge through ports and depending on the deflector to separate it from the burned. Mr. Malcolm's statements in his various articles as to the reliability of the two-cycle engine would be very conflicting to a person not having actual experience with these engines. What we want are actual facts.

At the end of my criticism of Mr. Malcolm's article he states through an editor's note that the error referred to by me was due to the draughtsman. Now, will Mr. Malcolm kindly explain how the condition so minutely described was to be obtained of having the spark plug extend down into the tube with the valve in any other position than that shown in his drawing? If he intended the valve to be in the position shown by sketch, where does the tube come in that surrounds the spark plug when the piston is at top of stroke?

L. R. WOTTRING.

Prospect, O.

TESTING TO OVERCOME PITTING OF POINTS.

Editor THE AUTOMOBILE:

[628.]—I note in the issue of February 21, letter No. 584, and would advise Mr. Stark to have his coil tested with a Connecticut Coil Ammeter, and see how much current it is taking from his battery. The pitting points to large current consumption, and in most every coil I test this is the trouble. I have a four-cylinder coil here now, two coils of which will not work at less than 1 3/4 amperes, and they should work at not over 1-2 to 3-4 of an ampere, while the coils on my cars are set at 4-10 of an ampere and never give any trouble.

E. F. BACHELLER.

Lynn, Mass.

ANOTHER TO THE RESCUE OF NO. 582.

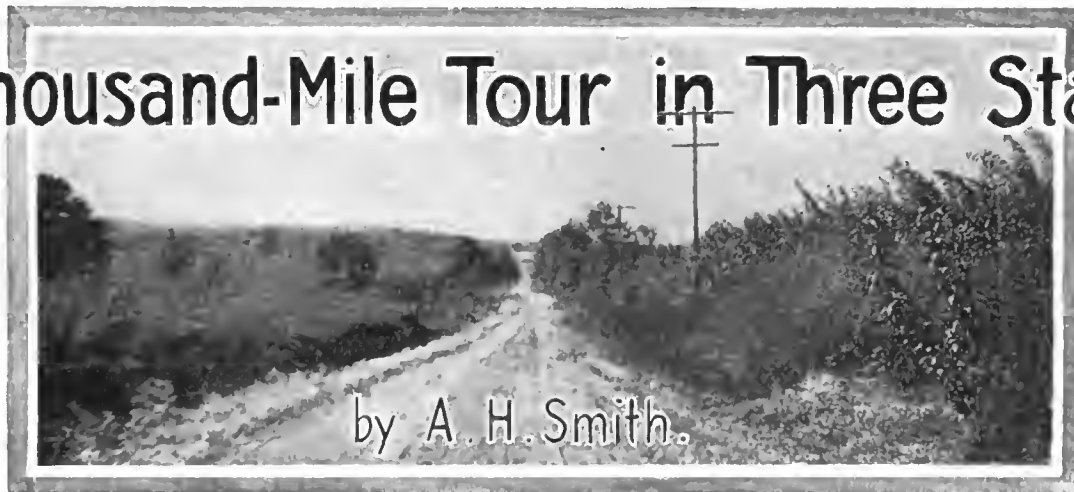
Editor THE AUTOMOBILE:

[629.]—In reference to your reply to Wenzel Bros. & Co., No. 582, will say that in the writer's opinion the cause of motor running unsteady is due either to a clogged gasoline supply to carbureter or a sticky float, and that the back-firing in carbureter is due to the mixture becoming too weak through lack of proper gasoline level in carbureter, and not on account of improper valve timing or pitted valve seats, as you suggest. What did No. 580 find to be the cause?

W. H. RICKEY.

East Orange, N. J.

A Thousand-Mile Tour in Three States.



by A. H. Smith.

IN this particular Illinois home that evening the conversation had drifted to the ever-fascinating subject of touring—just as it so often does in thousands of other homes—and comment was made that within two years some sixty automobiles have come into use near Earlville, and that, like in other communities, as the home drives become familiar there follows the natural desire for touring. It is safe to say that no subject appeals more strongly to the average autoist to-day. Every owner of a car has unconsciously let his mind's eye wander to distant cities where reside relatives or friends at whose door he will sooner or later rap.

Following comment at home gatherings comes anticipation, and, soon, the genuine realization. Notice of our departure was so short that little opportunity was had for anticipating; in fact, our "road map" at the start was cut from a railroad time table picked up the last minute before waving handkerchiefs to friends and gliding swiftly away from Earlville, Ill., at 9:30 A. M., Wednesday, October 3, en route, as we supposed, to the State fair at Springfield, 170 miles to our southwest. We talked a little of extending the trip, but had hardly considered it seriously. However, the first day out settled it.

It was a clear October day, with rustling autumn leaves of every tint and hue, and the very atmosphere seemed to carry the

regular pulsing throb of our motor to the beautiful wooded hills and to bring back the echo of "Come, come, come," as the car reeled off the miles past the constantly changing panorama of productive Illinois farms, the world's greatest corn belt.

At 10:40, Utica, at the base of the bluff in the Illinois river valley, was passed, and the river crossed by ferry boat, there being three spans of the bridge missing since a severe wind storm last Summer, when an unfortunate farmer and his team were drowned in crossing. For three passengers and our Cadillac the modest sum of 55 cents was charged, but the teams on the same boat paid less and took up more space. Very good dirt and gravel roads were found ahead, and we stopped at Wenona for dinner. The Illinois Central Railroad was followed from here almost due south.

Kappi was reached in the middle of the afternoon. Long live Kappi, and may it prosper, for we got lost in the ravines and made ineffectual attempts to ford the Mackinaw river, that looked dark and treacherous after a recent rain. For twenty miles down stream there was no bridge, but three miles up there was one, and now for a rougher country and winding roads and pretty scenery.

Shortly after 6 o'clock Bloomington was reached, and we registered at the Illinois. Here it was learned that the Bloomington



ON THE ROAD NEAR COLUMBUS, IND., AFTER PASSING A CARAVAN OF MIGRATING GYPSIES.



CROSSING ILLINOIS RIVER BY CABLE FERRY.

club had planned a road run of seventy miles to the State fair. We met Samuel Erwin, first vice-president of the Illinois State Automobile Association, and next morning at 9 o'clock took after his Buick, from which was scattered the confetti at every turn to guide the club members. Such a morning! Cloudy, foggy, and drizzling. Two miles out Mr. Erwin turned back, as no other club members ventured, and we hit the trail alone. Later members of the club went as far as Lincoln, telephoned to Springfield, found it raining there and turned back.

We took dinner at Lincoln, thence bore west and south to Fancy Prairie, where mud began to bother and things ahead looked like anything but a "fancy prairie." A crowd of good-natured loungers at the country store, headed by a joker named "Rube," asked questions and watched while gasoline was procured for a twenty-mile pull through mud, mud, mud, to Springfield, capital of the great State of Illinois, whose inhabitants would blush for such highways could they know of the hundreds of miles of really excellent hard roads our party were to encounter in sections of country less thrifty. There was just one redeeming feature about that twenty miles of mud, and that was the way our sturdy car slowly but surely plowed through it on low gear for three hours, past horses and buggies that tried to keep up. We had been advised for thirty miles to keep away from "sand hill," but conquered it at a steady pull, arriving in Springfield at 7 o'clock. Friday and most of Saturday were pleasantly spent in viewing the State fair and city, and in visiting friends.

Fascination of Touring Had a Grip.

But the fascination of touring had a grip on us, and late Saturday afternoon our car was headed for Decatur over rough but fairly good roads, and 7:30 p. m. found us looking for hotel accommodations there, made scarce by Sousa's band. This



PICTURESQUE STONE FARMHOUSE IN KENTUCKY.

fifty miles was marked by an exciting race with the electric cars. They would pass us only to be again passed at each station. Incidentally a large touring car joined in the race, but struck a bad place in the road that we luckily avoided, and stopped, and we saw them no more until overtaken in the outskirts of Decatur in stopping to light the tail lamp and display our "number," viz.: initials and address. Leaving Decatur at 7:35 a. m. Sunday, at Oakland a delay of three minutes was caused by the eccentric pushrod that operates the intake valve slipping from place, the only happening of the kind in our experience.

Paris was reached for Sunday dinner. The country thus far was fairly level, and roads fair to good, mostly dirt. Shortly after leaving Paris we started a sleepy old plug of a horse from his nap among the winding hills and he ran in the narrow road in front for two miles, and was so stirred up that he followed as long as we were in sight after passing him.

We Cross the Wabash at Terre Haute.

A hilly country and zigzag roads brought us to Terre Haute, Ind., across the Wabash, at 5 o'clock, where quarters were engaged at the Filbreck hotel. Inquiry as to a State license indicated that little attention is paid to the matter, and, perhaps, unwisely, we took the chance for Indiana and later for Kentucky. Monday morning from Terre Haute automobilists recommended the National road in a northeasterly direction to Indianapolis, a distance of ninety miles. Heavy traffic had damaged this road somewhat, though it was largely good, but very hilly in places. The worst hill was near Reelville, the steep winding kind, and, of course, a team was met right in the middle and a forced stop made, but immediately the car went on up with its load, which, with baggage, top, etc., equaled five passengers. Our car was a model "F," 10-41 gear, not specially geared for mountain climbing, but having all the power needed on the low gear, though at times more power on the high gear would have taken the hills faster. A speed of thirty miles an hour could be attained on the level. This car had already been run 9,000 miles in fourteen months by the writer in his business.

Orchards Were Plentiful.

Orchards innumerable were passed (and some were not), with apples being gathered in huge piles for market. As the summit of a hill was mounted, a teamster, who had fed his team of mules after slipping their bridles, was dozing. Talk about action! We will match him against the world for getting on his feet and bridling the nearest mule and hanging on with a desperate grip, though the mules only gazed in curiosity. No good opportunity presented itself for dinner until at Indianapolis late in the afternoon. As usual, gasoline, oil, and water were procured at a garage and the carbureter adjusted to the new gasoline. The car then headed southward. Boulevards were soon left behind, and the Madison State road taken fifty miles to Columbus, arriving early in the evening over highways that were a motorist's dream of pure joy.

Next morning Columbus was bade adieu early. Rain in the night had not spoiled the roads, which were good to Seymour and poor to Scottsburg, where at noon a rattling good dinner made up for it, as big a surprise as our appearance through such muddy roads. A few minutes was spent here in taking up the driving chain.

Hills Broadened and Valleys Deepened.

From Scottsburg the country began to change, the hills broadening and the valleys deepening. An electric line in process of construction was in sight more or less the entire afternoon, and darkies by the hundreds swarmed the grades and cuts, driving mule teams. More than once a warning hand stopped us while blasting was done with dynamite. Fertile spots of land would no more than get nicely started before rising to timbered hills which seemingly ended at the horizon in a maze of autumnal color beautiful to behold. The striking contrast of numerous

log houses, rail fences and often no fences, with here and there more pretentious homes, brought to our mind the thought that, after all, "there's no place like home" wherever you are.

Near Jeffersonville five cents toll was paid, and soon, with brake held firm and reverse ready for instant use, a steep hill ended abruptly on the bank of the muddy Ohio. Ferryboats alternate between here and Louisville, and 30 cents was the reasonable charge from Indiana to Kentucky soil. Withal it had been a pleasant ninety miles from Columbus, and called for sound, sweet sleep.

It Snowed in October in Kentucky.

Louisville autoists promised extremely hilly roads to Lexington, and, coming to a crossroads blacksmith shop a few miles out, it was decided to halt long enough to have the brake cable made doubly safe. It started to snow—think of it—the 10th of October, in Kentucky. However, the weather soon brightened, and, warmly clad, we were snug as could be with our heavy lap robes. While idly watching work on the brake cable, incidents of the trip were recalled. The ladies were invited into the house, and presently heard a spooky tapping on the door. With suppressed wonder they beheld a large tame goose admitted and fed biscuits from the hand of the housewife. No other food had ever tempted him.

Sign boards showing distance and direction will be great when they sooner or later come into general use. The average person questioned has no idea of distance, but usually makes a guess to oblige, and often you seem to get further away from a town, instead of closer to it.

Know Your Car to Enjoy Touring.

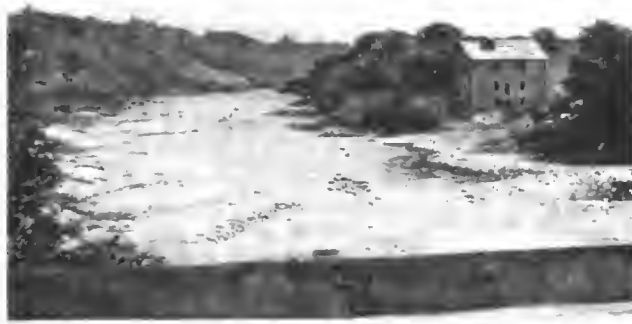
One thing about touring—know your car if you would get the full enjoyment of the trip each day by having that feeling of independence that makes responsibility a pleasure. It does away with garage bills and prevents being hung up on the road. Pay attention to detail and take nothing for granted, and, if you have anticipated by carrying possible necessities, a sane run will mean steady running.

With brake cable strengthened away we go again over Kentucky's famous hard roads, up one hill and down another, gliding safely and surely along through Shelbyville, and later into Frankfort, after a coast of half a mile from almost among the clouds into a picturesque valley, where nestled this pretty city, the capital. At 5 o'clock Lexington, the destination, was reached. Near Versailles had occurred the first puncture, 1905-06 Hartford-Dunlop tires of several thousand miles' prior use serving us well. Lexington and its race meeting of national fame were visited Thursday.

Then Came the Return Journey.

Friday morning, after putting in four new batteries and having the car washed, the return trip progressed over the same route, with unabated interest, to Indianapolis, Seymour being made the first day, a distance of 138 miles, where were met representatives of "THE AUTOMOBILE Official A. A. A. Blue Book." Saturday a glorious ride of 133 miles was enjoyed through Indianapolis and on to Logansport, 70 miles of the distance being straight ahead, without a turn, over the Michigan State road. Here a leak in a water pipe was stopped with tire tape.

Sunday the route taken was from Logansport to Momence, Ill. and as a new road map procured en route indicated no sandy counties, we struck some fifty miles of more or less low and high-gear mixed in irregular doses, not pleasant to take, but with a growing confidence in the single-cylinder Cadillac, if it were possible to increase that confidence. Only twice in these sand hills, when the driving wheels would spin, did the ladies get out, and then only because of a loyal sympathy for the sturdy car, which went through on its own power, no small feat when it is considered that residents there will tell you big touring cars with their added weight often bury themselves and have to be hauled out. Momence was reached at 7:30 o'clock, ninety miles, regardless of conditions.



DESERTED MILL ON THE VERMILION RIVER.

Monday morning found the country immediately changing to good old Illinois soil, and we rolled along through different towns to Morris, thence to Seneca and Marseilles, and back through Dayton to Earlville, where we arrived at 3:30 o'clock, after having been absent 12½ days, visiting 3 days, and covering more than 1,050 miles in the 9½ days' travel. Upwards of 175 towns were visited. One object of the trip was to ascertain from impartial sources what cars in their different classes were giving the best satisfaction in actual use.

Expenses of the Thousand-Mile Tour.

The expense of the tour is here given: Board and lodging, \$53; sundries, \$12.60; storing car nights, \$6.25; washing car, \$2; fifty-three gallons gasoline, \$9.75; lubricating oil, \$2.40, because of overcharging; batteries, \$1.40; repairs, \$1.60; total, \$89.

RAILROAD MAGNATE TO HELP ROADMAKING.

MINNEAPOLIS, MINN., Mar. 4.—President James J. Hill, of the Great Northern railroad, has announced that his road will haul crushed stone free to any part of Minnesota to aid in the cause of good road building.

The good roads question is prominently before the Minnesota legislature now, owing to the introduction of a bill to authorize the employment of convict labor at stone-crushing and road building. The good roads people who advocate the passage of the bill have strong allies in the implement dealers of the State, who are fighting the passage of a bill authorizing the manufacture of farm implements by convict labor. The implement men have issued published statements, which have been circulated all over the State, urging the passage of the Elwell bill for convict labor on the roads.



DRIVING ABOUT THE ILLINOIS STATE FAIR GROUNDS.

CHARACTERISTICS OF VANADIUM STEELS

By J. KENT SMITH AND W. L. TURNER.*

It has been abundantly recorded that the element Vanadium, when judiciously applied in conjunction with other alloys, has very important effects upon steel in the way of largely increasing its static properties (strength and ductility) and, *what is of still greater importance*, of conferring to it extraordinary dynamic stress-resisting qualities such as have hitherto not been met with in other types of special steels. Up to the present, however, little or nothing has been done in this country with the manufacture of vanadium steels. However, a company in Pittsburg having successfully developed a mine rich in vanadiferous deposits in South America, is now undertaking the manufacture of this steel in quantity and of composition to suit requirements.

But Few Sources of Supply.

Before proceeding, it will be of interest to mention a few facts regarding this metal. Its separate existence was discovered about one hundred years ago. Chemists of the day alleged that this element, christened Erythionium, was being confused with the known element Chromium. It was re-discovered about thirty years after this and was re-christened with the name of Vanadium. Its chemical properties were little understood until Sir Henry Roscoe, after an exhaustive investigation of the element and its salts, finally isolated metallic vanadium for the first time.

Owing to the few known sources of supply, it was not considered that vanadium would ever attain more than academic importance, but recent discoveries altered this. The metal has an exceedingly high fusing point (2000° C.) and this alone would be sufficient to prohibit its use in steel manufacture; but from the fact that an alloy of iron containing 30 to 40 per cent. vanadium has a much lower fusing point than that of ordinary mild steel this objection to its commercial employment is removed, while high-class open-hearth steels can be produced by its aid at a reasonable price. Until recently the chief sources of vanadiferous ores of any importance have been:

- 1st—The vanadiferous lead ores of Spain.
- 2d—The ash of the Yauli anthracite deposits.
- 3d—The vanadiferous sandstones of Colorado.

Effect of Vanadium on Steel.

It has been proved that the most successful application of vanadium lies in the direction of quaternary steels, such as chrome, or nickel-vanadium steels. In order to obtain the best results with these elements, it is necessary to add the vanadium in homeopathic doses, with proper precautions, as it is a very powerful medicine and possesses to a very marked extent the property of "elusiveness." One of its most important effects on steel is its power of retarding the segregation of the carbides; examination under the microscope will most clearly exemplify this action and leads to the inference that vanadium steels should be particularly suitable for tempering, as is found by actual experiment to be the case. Being chemically similar to aluminum, vanadium also produces somewhat similar results in conferring soundness on the steels containing it. Further, vanadium appears to toughen the micro-constituent ferrite, and the latter in vanadium steels is shown to have a very closely interlocked granular formation.

Again, vanadium has been proved to be a powerful intensifier of the static action of other alloys. Now, it may be regarded as axiomatic that the employment of an alloy in such quantities as to largely increase the static strength of steel implies dynamic deterioration. Taking advantage of the intensifying action above alluded to, it is possible to obtain largely increased static effect with such a small proportion of the secondary alloy as not to bring about this dynamic deterioration. As vanadium itself possesses perhaps its most valuable property in its extraordinary powers of conferring to steel *added* dynamic excellence, com-

binations are possible which are absolutely unapproachable by any other means available at the present day.

Tests Not Sufficiently Comprehensive.

It has always been the custom to judge the quality or utility of a steel for all purposes by its behavior when subjected to a steady load. It has been the aim of the steel makers to show a high tensile figure, and a certain amount of static ductility at the same time. It has been argued that the standard of quality of steel for all purposes should be gauged by a combination of these two factors. Using the ordinary composition, it was, of course, found that, having exceeded a certain strength, the steel commences to become brittle in the sense that static ductility is being sacrificed. It was then discovered that by using certain other elements in addition considerable increase could be obtained in the tensile figures before any appearance of such brittleness was apparent. The fact that steel could bend cold through a certain angle was looked upon as an additional guarantee of its universal fitness. But no proof has been given of the assumption that a steel which is of the best quality for service under statically applied loads should also come out "on top" when employed in machinery where resistance to vibration and shock is of fundamental importance. It is difficult to see the reason for the continued adherence by manufacturers to the plain tensile test only, as a large proportion of the stresses applied are in the nature of shock and vibration; indeed, it has been calculated that in a high-speed engine between 80 and 90 per cent. of the total stresses are applied dynamically. The eventual result is that ordinary steel will become brittle when subjected to these repeated alterations of stress and will break down, notwithstanding the allowance of a large factor of safety. It has been proved that vanadium retards this deterioration under fatigue and alternating stresses, so that the "life" of the metal is greatly increased. Heat treatment, again, is of direct importance in the preparation of any steel.

Special Grades Being Marketed.

Vanadium steels have undoubtedly brought forth revolutionary possibilities in materials for employment in all machinery and moving parts. The enormous number of laboratory and actual working tests which have been made show their undoubted immense superiority over all other special types for resistance to stress, and this is of great importance in automobile work.

Below are a few of the types designed by the American Vanadium Company to most successfully withstand the specific conditions to which they are to be subjected:

- (1) A type specially prepared for use in machinery in which shock, vibration, and alternating stresses occur, as in crankshafts, axles, piston rods, etc. This steel will withstand a severe shock, as well as a mild steel of only one-third its strength, will resist fatigue to a much greater extent than the highest qualities of ordinary mild steel, and has a wearing surface superior to any known non-brittle material, while its torsional elastic limit is very high.
- (2) A type specially compounded to meet conditions requiring resistance to alternating stresses and shock in the highest possible degree. This steel has the static strength of good nickel forging steel, while dynamically it is enormously superior to the best mild Swedish steel. In connecting rods, piston rods, coupling rods, light axles and similar work, practical difficulties have been overcome by its aid which have been regarded as insurmountable.
- (3) A type designed to resist torsional destruction to a maximum degree, and at the same time to have a comparatively high elastic limit and resistance to shock. Wonderful results have been obtained in practice with this type in holding down bolts and hydraulic machinery.
- (4) A type suitable for the construction of springs of all kinds, both for heavy and light loads. This steel in the raw state may be bent and knotted cold, but when heated and quenched will become hard enough to cut glass. Its coefficient of safe working load when tempered is double that of the ordinary carbon spring steel. Its vitality being extraordinarily high, springs in "difficult" places, subject to frequent overload especially, should be made from this steel.
- (5) A type eminently adapted for all case-hardening operations. A case may be obtained so hard that it can only be indented by grinding, while at the same time a very tough core is obtained having similar tensile figures to type No. 1 above.
- (6) A type of pure low carbon Vanadium steel which is, in its special properties for withstanding vibration, superior to the best wrought iron obtainable, while it welds with the freedom of that wrought iron.

*Chief Metallurgist and Associate Engineer of the American Vanadium Company, Pittsburg.

CLUB NEWS WAFTED IN BY MARCH WINDS

New Jersey Autoists' Endurance Run May 30-June 1.

NEWARK, N. J., March 4.—May 30, May 31 and June 1 are the days definitely fixed for the spring endurance contest of the New Jersey Automobile and Motor Club. It is thought by fixing upon this date to obtain the entry of a large number of club members who could not ordinarily spare three days from their business. May 30 being Memorial Day is, of course, a legal holiday, while Saturday, June 1, will be a half-holiday. Definite arrangements as to the route have not yet been made, but it is expected that the distance will be 350 to 400 miles and that a start will be made from Newark. From this point the run will probably be to Dover via Montclair, Pompton, Butler, Denville and Rockaway. At Butler there will be a control, and at Dover the contestants will stop to lunch. From Dover the run will continue over Mine Hill, through Kenville, Mt. Carmel, and Mt. Freedom to Morristown, where another control will probably be placed. From Morristown the route will lead back to Newark by the regular way through Madison and Chatham. On Friday morning the competing cars will journey from Newark through Rahway to New Brunswick, where the first control will probably be placed; thence to Trenton by way of Hightstown. At Trenton will be another control. It is uncertain what route will be taken from Trenton to Atlantic City, but Camden will probably be avoided and the better route taken passing outside the city. Starting from Atlantic City on Saturday morning, the machines will pass through Pleasantville, Absecon, Port Republic, Tuckertown, Barnegat, Forked River and Toms River, to Lakewood. From this point back to Newark the route is somewhat uncertain and a sub-committee has been appointed to work out details.

At the outset it had been intended to make the competition merely a test of staying power of the competing machines. When the ground was gone over, however, it was found impossible to run the tour on this basis.

Keeping it within the State of New Jersey took the machines over such good roads that a dozen cars might traverse the whole distance without incurring a single penalty. It thus became necessary to introduce some other restrictions, and the only one that seemed practicable was economy of fuel consumption. It is not yet definitely settled that the economy feature will be adopted, but the chairman and other members are of the opinion that it will bring about the best results. One point which will be insisted upon is that the machines shall absolutely adhere to the twenty miles and hour State law. Any car exceeding this limit will be penalized. Under practically all circumstances the machines must be kept running, by which regulation is meant not merely that the motor must be kept going, but that the car itself must not be stopped. The only stoppage allowed for is when a restive horse is met, the driver of which signifies that the car must stop as allowed by law. It is intended to make the competition of such a searching nature that it will be almost impossible for more than one or two machines to come through with a clean score.

Two classes will be provided for, one for touring cars, the other for runabouts. The touring car trophy will consist of a cup donated by W. C. and B. M. Shanley, Jr., while the New Jersey Club will offer a cup for the runabouts. Each automobile must carry the full number of passengers advertised by the manufacturer as capable of being seated in the car. Secretary H. A. Bernell is chairman of the committee in charge of the arrangements.

Rockford Club Elects Officers for Coming Year.

ROCKFORD, ILL., March 1.—After a spirited contest at the annual meeting, the following officers were elected for the ensuing year: La Verne Cole, president; James Rogers, vice-president; Horace Havens, secretary; Dwight Cutler, treasurer. S. C. Andrus was chosen director to succeed Dwight Cutler.

Minnesota State Body Organized for the A. A. A.

MINNEAPOLIS, MINN., March 4.—The organization of the Minnesota State Automobile Association has just been perfected, the first object of the association being to protect automobilists against drastic anti-automobile legislation now pending in the Minnesota Legislature. Four clubs joined the association on its formation, the Minneapolis Automobile Club, St. Paul Automobile Club, Duluth Automobile Club, and Mankato Automobile Club.

The officers of the association are: President, Frank M. Joyce, Minneapolis; vice-president, George M. Palmer, Mankato; secretary-treasurer, H. S. Johnson, St. Paul; directors, H. H. Myers, Duluth; G. A. Lewis, Mankato; Dr. C. E. Dutton and G. A. Will, Minneapolis; Oliver Crosby and T. W. Ingersoll, St. Paul. A committee on legislation was appointed, consisting of Dr. C. H. Kohler and Col. Joyce, Minneapolis; H. H. Myers, Duluth; George C. Knocke and L. A. Wood, St. Paul.

The officers of the club and members of the board of directors and legislative committee include the most prominent men in the automobile and good roads associations of the State. A hearing has been arranged by the House committee, before which the automobile bills now lie, and members of the State association will appear before the committee within a few days. It is planned to push good roads work vigorously through the medium of the State association. Preliminary work has been done on a highway from Minneapolis and St. Paul to Duluth, and the association will push this 150-mile road with vigor. The members of the clubs comprising the State association are practically agreed upon remedial legislation necessary for the welfare of the State and the automobilists, and will have recommendations and amendments ready for submission to the legislative committees.

Discussion was also started looking toward a day of racing at the State Fair this year. A committee appointed to investigate this matter includes S. N. Colburn and Asa Paine, who presided over the Ormond-Daytona races this year; L. A. Wood and Theodore Griggs, St. Paul, and R. E. Brown, Mankato.

Quaker City Club Appoints Its Committees.

PHILADELPHIA, March 4.—Spurred on by the spring-like weather of the latter part of the week, President Swain of the Quaker City Motor Club on Saturday last announced the committees which will serve during the next year. The delay in the announcement was due to the president's desire to appoint no one who could not actively work on the committee to which he was assigned. As a result, quite a number of changes had to be made before the list could be finally completed. Following is a list of the committee chairmen: Membership, A. T. Stewart; house, Nathaniel Hathaway; contest, E. C. Johnson; press, E. H. Fitch; auditing, L. D. Berger; law and ordinances, G. Douglas Bartlett; good roads, A. E. Maltby.

At the regular monthly meeting next Thursday, Chairman Johnson of the contest committee will announce the program for the season.

Successful Banquet of the Staten Islanders.

ST. GEORGE, S. I., March 2.—The Richmond County Automobile Club held its annual banquet to-night at Hugot's Hotel, sixty members sitting down to the elaborate spread. President Charles A. Schultz made a witty and versatile toastmaster. The speakers included A. R. Pardington, vice-president and general manager of the Long Island Motor Parkway, and when he had concluded his optimistic remarks about the special road for automobiles, the Staten Islanders were in a mood to engage him to begin work on a similar highway as soon as his Long Island task is completed.

Other speakers included H. E. Buel, superintendent of high-

ways of the Borough of Richmond; Henry P. Morrison, county engineer before the consolidation, and T. F. Moore, of the New York Motor Club.

The most pleasing feature of the evening was the presentation of a handsome loving cup to J. J. Worrell, the hard-working secretary of the organization. William S. Van Clief, president of the Richmond County Agricultural Society, made the presentation speech, to which the recipient of the cup responded in a happy and appreciative vein.

Plans of the New York Motor Club.

NEW YORK, March 4.—At the recent meeting of the directors of the New York Motor Club, with President S. B. Stevens presiding, it was decided to hold a club smoker on the evening of March 15. Preceding the vaudeville part of the program, there will be a six vs. four-cylinder discussion, in which have been invited to participate representatives of leading makers. It is expected that a formidable array of speakers will be secured for both sides of the discussion, which will be followed by high-grade vaudeville features and refreshments. It is among the possibilities that the club will soon be located in larger and more commodious quarters, there being some talk of renting an entire house near the Broadway automobile district.

In the form of an advisory committee to the board of directors the following were designated: A. R. Pardington, S. A. Miles, Alfred Reeves, C. B. Rice, John Kane Mills, George McKesson Brown and T. F. Moore. These will be added to the board as soon as the necessary constitutional changes can be effected. A. B. Tucker has tendered his resignation as secretary.

Tacoma Automobilists Active for Good Roads.

TACOMA, WASH., Feb. 28.—At the annual meeting of the Tacoma Automobile Club a special committee was appointed to raise \$5,000 to aid in the paving of Center street, which illustrates that the club members are willing to pay for what they think will be of public benefit. The main idea of the club is to get concerted action on such schemes as are necessary for the proper pleasure of autoists. The ultimate aim is to have a club which will be somewhat social in character and which will have regularly appointed runs; but at present the organization is working for better roads in the city and adjoining country and for permission to enter the Government reservation at Paradise Valley.

Under existing conditions automobiles are not allowed within the national park there. The reason for this is not known. The Tacoma Automobile Club, through Congressman F. W. Cushman, is attempting to have this regulation repealed, and if successful will devote a part of its efforts to building a road from Tacoma to connect with the Government road being built on the reservation. If, however, the Government refuses to give the required permission, the club will gain no good from helping to have the road built, and, in all probability, the scheme will be dropped.

The following officers were elected for the current year: President, Chester Thorne; vice-president, Richard Vaeth; secretary, H. H. Gove; treasurer, Fordyce Taber; trustees, John F. Lyon, J. C. Donnelly, and Calvin Phillips.

Long Island A. C. May Rejoin the A. A. A.

BROOKLYN, N. Y., March 5.—Growing sentiment in favor of a renewal of the membership of the Long Island Automobile Club in the American Automobile Association is taking a pronounced form, and an early return to affiliation with the national organization is predicted by the knowing ones. In withdrawing from the A. A. A. the Long Island Automobile Club was criticized. The action of the local club was construed by some to mean that it wished to take no more active part in furthering the cause of the autoist. This is far from the case. It would be hard to find a member who is not intensely interested in every move made to help along the man who wants to use the automobile. The local organization felt that it was not receiving an adequate return for the money which was paid as dues to the

national body. Since last year the American Automobile Association has undergone a change which, in brief, leaves to the different State associations affiliated with it the bulk of the work of guiding legislation, promoting the cause of good roads and other moves calculated to be of benefit. Seventy-five per cent. of the dues now paid go into the treasury of the State bodies, the other 25 per cent. only passing into the national treasury.

The Long Island Automobile Club has always been a believer in the great good to be derived by pooling interests in the united action made possible by a State body. Many of the members believe, however, the time is now ripe to again join hands with the men who are pledged to protect and further the interests of the automobilist in every way possible.

Harrisburg's Motor Club is Organized.

HARRISBURG, PA., March 4.—Local automobilists and motor boat enthusiasts have organized the Motor Club of Harrisburg and have elected former Mayor Vance C. McCormick, president. The other officers are: First vice-president, Oscar C. Robertson; second vice-president, R. R. Buvinger; third vice-president, Charles C. Cumbler; secretary, J. Sidney Sible; treasurer, John C. Nissley. The board of governors consists of Dr. John Oenslager, Herbert F. Rawll, C. G. Nissley, James A. Bell, James McCormick, Jr., Roy Senseman, A. Stees, Frederick D. Carney and Howard Jenkins. The following chairmen have been appointed to head the special committees: Membership, R. A. Sef-ton; house, I. W. Dill; exhibitions and runs, R. C. Haldeman; laws and ordinances, D. C. Haldeman; auditing, H. C. Wright; roads, J. C. Nissley.

One of the first steps to be taken by the new organization will be to secure better roads in the vicinity of this city. The roads leading into the Capital City are in terrible condition at the present time owing to the refusal of the supervisors to apply for State funds. The exhibition and run committee is arranging for a two-day endurance run during the latter part of April which will include Lebanon, Lancaster, Columbia, York, Hanover, Gettysburg, Chambersburg and Carlisle in the itinerary. An automobile parade and other contests are planned for the summer. The club has a charter membership of 130 of the most prominent business and professional men in the city.

THE AUTOMOBILE CALENDAR.

AMERICAN.

Shows.

- March 9-16.....—Boston Automobile and Power Boat Show, Mechanics' Hall and Horticultural Hall, Boston, Automobile Dealers' Association. C. I. Campbell, mgr.
- March 13-16....—Omaha, Auditorium, Second Annual Automobile Show, Omaha Dealers' Association. T. Gillman, manager.
- March 18-23....—Providence (R. I.) Automobile and Power Boat Show, Infantry Hall. F. M. Prescott, manager.
- March 21-30....—New Haven, Conn., Second Regiment Armory, Automobile Show, under the auspices of the local dealers.
- April 1-6.....—St. Louis, Mo., Automobile Show, Jai Alai Building, St. Louis Automobile Dealers' Association.
- April 6-13.....—Montreal, Canada, Second International Automobile and Sportsman's Exhibition. R. M. Jaffray, manager, 309 W. Notre Dame street.
- April 8-13.....—Pittsburg, Pa., First Annual Show of the Pittsburg Automobile Dealers' Association, Duquesne Garden.

Races, Hill-Climbs, etc.

- April 1.....—St. Louis, Mo., Auto Floral Parade, Automobile Club of St. Louis.
- April 8-9.....—Harrisburg, Pa., Two-day Endurance Run, Motor Club of Harrisburg.
- May 30.....—Philadelphia, Hill Climb, Quaker City Motor Club.
- May 30 June 1...—Newark, N. J., Endurance Run, New Jersey Automobile and Motor Club.
- Oct. 19.....—St. Louis, Mo., International Aerial Race for the Gordon Bennett Prize. Aero Club of America.

WIDESPREAD INTEREST IN A. A. A. ANNUAL TOUR

THE exact route and the rules for the Glidden and other trophy contests involved in the annual tour of the American Automobile Association may not be announced for a week or more, despite the fact that the Touring Board held a meeting at Buffalo, March 1, and formally organized by selecting sub-committees, the chairmen of which compose the Executive Committee, the head of which, of course, is Frank B. Hower, the chairman of the entire board. James B. Dill, East Orange, N. J., is chairman of the Touring Information Committee; L. E. Myers, Chicago, of the Foreign Touring Committee, and Philip S. Flinn, Pittsburg, of the Road Signs Committee. Dai H. Lewis, Buffalo, is to serve as the special secretary of the Touring Board.

Judge Dill's sub-committee has twenty-six members, and its duty will be to assist in the accumulation of all kinds of touring information, which shall be kept by the secretary of the A. A. A. for the benefit of all members. In like manner the committee of twenty-seven, headed by Mr. Myers, will obtain foreign material. Mr. Flinn's road signs work will include the formulating of plans to bring about the marking of the trunk roads of the country, either through the aid of local laws and authorities or by co-operation of State associations and clubs.

The Buffalo meeting agreed upon several necessary changes in the deed of gift for the Glidden trophy, and Mr. Glidden will be asked to assent. The most important change is one suggested by the Automobile Club of Buffalo. Percy Pierce, winner of the trophy in 1905, and retaining same for the Buffalo Club through tieing with the other clean-score participants in the 1906 tour, was a factor in advancing the change which would prevent the Buffalo organization keeping the trophy in case of another tie. In this event the trophy might go to the club which supplied the most survivors, but it is understood that the desire of the Touring Board as a whole is that the 1907 contest shall be of such a strenuous character that the possibility of ties will be greatly reduced.

The Executive Committee of the board had a conference on Wednesday of this week with the Contest Committee of the National Association of Automobile Manufacturers, which some time ago had in mind the running of a series of contests for

stock cars, but recently came to a decision that amounts to the giving up of the idea. As a result of the conference between the A. A. A. officials and the N. A. A. M. representatives, something definite may be expected in the near future. It may be that there will be a conference involving the N. A. A. M., A. L. A. M. and A. M. C. M. A. and the Executive Committee before all the details are decided upon.

As to the route, there are those who advocate a start in the West and a finish in the East; those who hold to the contrary and want the start in the East and the finish in the West; with a third element asking for a start in the East and a turning point in the West and the finish in some Eastern city other than the starting point. Unquestionably there is keen interest in the affair, and the entry list promises to be substantial, no matter what route is chosen.

The Hotchkiss Administration is Making Great Headway.

On the heels of the report of the formation of a Minnesota State Association of the A. A. A., containing four clubs and over 800 members, comes two conferences this week that may bring about two more State bodies. Last night at Philadelphia there was a conference of President W. H. Hotchkiss and other members of the Executive Committee with President Isaac Starr, First Vice-President Robert P. Hooper, and Secretary Paul C. Wolff, of the Pennsylvania Motor Federation, which possesses fifteen clubs and has upwards of 1,500 members. To-night, at Bridgeport, Conn., there will be a conference with representatives of several Connecticut clubs. A Connecticut body is practically assured, and it will probably start out with the Hartford, New Britain and Bridgeport clubs as the nucleus.

Secretary F. H. Elliott will take a trip through the Middle West next week to attend meetings in Michigan, Indiana and Kentucky, in all of which States organization work is already under way. Tentative organizations have been formed recently in Wisconsin and Missouri, and from present indications there will be six or eight applicants for State membership at the March meeting of the A. A. A. Board of Directors, which will take place the latter part of the month.

FEDERAL BILL OF THE A. A. A. IS NOW UP FOR DISCUSSION

A START has been made by the American Automobile Association in the direction of national legislation concerning automobiles. Chairman Chas. T. Terry of the legislative board last week went to Washington and had introduced through Representative Cocks of New York a bill entitled "An Act Providing for the Regulation, Identification and Registration of Motor Vehicles Engaged in Interstate Travel." It was not expected that action could be obtained at the session of Congress which has just closed, but it is anticipated at the forthcoming Congress of next December that the measure, which was referred to the Committee on Judiciary, will receive early attention, and automobilists who have examined its provisions are confident that it will be declared constitutional if it becomes a law. The main features of the measure are as follows:

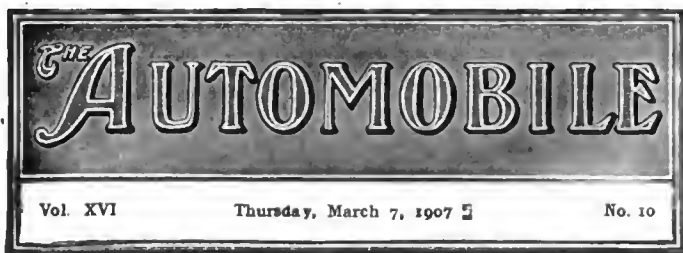
(1) **Exemption from registration provisions of State laws other than the laws of the State of the owner's residence.** Thus: On compliance with the provisions of the act with reference to previous registration in the State of the residence of the applicant, and on filing with the bureau created by the act of a verified application, which application shall state among other things the name and residence of the applicant, his State registration number, a description of the vehicle, the manufacturer's number, the character of the motor power and the amount of such power stated in figures of horsepower, such bureau shall issue to the applicant a certificate of registration and a federal number. Thereafter in travelling anywhere in the United States outside of the State of the owner's residence, such owner shall, by displaying the federal number on the front and rear of his motor vehicle, be exempt from

the laws of other States regulating registration and the carrying of numbers.

(2) **The Identification number or sign.**—The provisions of the act require that while the vehicle is in a foreign State, such number shall always be displayed both in front and in rear; the number to be three inches high, with the initial letter or abbreviated designation of the State where the vehicle was originally registered at the left of such number and the initials of the United States at the right of such number.

(3) **The Motor Vehicle Bureau:** The act will create in the Department of Commerce and Labor a bureau in charge of a commissioner with a secretary and clerical assistant. To such bureau will be sent all applications, and in it will be kept records of the vehicles registered, indexed for ready reference and the supplying of information on all proper requisitions for the same. Salaries are provided for the commissioner, secretary and clerical force, payable out of the fund created by the registration fees. Such fee will be \$5 in the case of an individual and \$10 in the case of a manufacturer.

"The Congressmen who studied the provisions of the bill," said Mr. Terry after returning from Washington, "seemed highly pleased with it. They all expressed their satisfaction that the bill was presented at this time because it will offer ample opportunity before the next Congress for its provisions to be thoroughly discussed, and any amendments or additions that might be necessary will be in readiness for discussion as soon as the bill comes properly before the House. I may be enthusiastic, but I sincerely hope and expect to see the bill a law within a year at least, probably less. It will become a law 30 days after being signed."



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The Road Question Is Up to the Automobilist.

"If I read aright the signs of the times, the hour has come for the automobile interests to take up the road question as their question." Thus writes James W. Abbott, a prominent ex-commissioner of the Office of Public Road Inquiries, and a man who has argued and talked for good roads these many years. Mr. Abbott's very able comments will be read with keen interest, and his opinion should carry the weight of an authority whose observation has been unbiased except to the extent of working for that which he believes to be for the general good of the entire country in the establishment of a road system which will compare with the ideal kind of the far-seeing French.

Mr. Abbott believes that the automobile has captured the farmer, and he predicts that the country nabob will soon plow, plant, sow, and till his fields and gather his harvests with motor devices. Mr. Abbott suggests, as he did several years ago, that the automobile, carriage, farm vehicle, street paving, brick making, and other industries should be represented in a national organization, the existence of which should be for the building of good roads. It might be noted that of all these interests he now places the automobile first, and the reason for so doing is becoming plainly more apparent every day.

In the future building of these roads there may come the necessity of a radical change in the present method of construction, for it cannot be denied that the coming of the automobile is exacting from our roadways a mileage many times greater than has been called for by the horse-drawn vehicle.

Advance in Metallurgy Due to the Automobile.

Apart from the fact that the automobile as typified by the gasoline type of car, with its internal combustion motor and sliding gear speed changes as an essential link in the transmission of the power, is proving an unqualified success despite the voluminous predictions of some years ago to the contrary, nothing has served to emphasize the position it now occupies so much as the advances in the art of metallurgy for which it has been responsible. Considered as a piece of machinery, the automobile costs more per pound than any similar piece of mechanism manufactured, and this, it is averred, is the reason why its makers have been able and willing to pay prices far beyond the reach of makers of other classes of machinery.

Strength, combined with lightness to a degree never before found necessary, had to be attained at any cost, and the result has been an impetus to the art of alloying steels, such as it could not have received from a quarter of a century of development in the ordinary course of events. The 12 and 15-horsepower cars of several years ago were already beyond the economic weight limit, both where tires and other considerations were concerned, so that a reduction of the weight was as imperative as an increase in power; but one could not be brought about without the other. The limit of development seemed to have been already reached in the case of carbon steels, so that the matter of alloying, supplemented by scientific heat treatment, was taken up and has been carried to an unprecedented degree.

To appreciate what has been accomplished, it is necessary to consider the modern automobile: carbon steels have given way to nickel-steel, and the latter, in turn, to chrome-nickel-steel, both having been brought to an unprecedented degree of improvement through the great amount of study devoted to the subject. And now we are to have vanadium steels—which from the rarity of the alloying component have hitherto been considered unduly expensive even for the automobile, though used to a limited extent on automobiles constructed abroad.



Further Progress in Alcohol Legislation.

Though loth to accede to the popular demand for legislation along this line, as was demonstrated by the number of years required to pass the Free Alcohol bill of last year, Congress having taken the first step, is evidently not going to be allowed to stop half way, as is shown by the action of the Senate during the past week. What this means to the automobilist will doubtless take several years of development to demonstrate, but that it will result in the ultimate good, not alone of one class of liquid fuel users, but of many, cannot be gainsaid. It has been claimed all along, that the bulk of the gasoline used to-day is consumed by the farmer in small stationary engines and in cooking stoves, and this being a fact, the granting of the right of the agriculturist to make his own fuel should certainly tend to relieve the situation to a great extent, though relief may be slow in coming.



The U. S. A. as a Market for British Cars.

Every Englishman connected with the industry who has come to this country, whether for a stay of a week or three months, has been visibly impressed with the great number of automobiles in use and the wretchedness of the roads their owners have to put up with, and has hardly been able to contain himself until he could get back home to tell his confrères about it. He pictures to himself a vast field for the British automobile to conquer and sets about to enthuse British makers in the propaganda of exports to America, citing the success of Continental makers to witness the golden harvest that awaits the reaper. The Hon. C. S. Rolls proved no exception to the rule. It would appear superfluous to call attention to the fact that more American automobiles are sent to Great Britain every month than there are British cars in this country all told, and the number of the latter does not grow in a manner at all indicative of a promising future.

WHAT FRELINGHUYSEN NOW SUGGESTS.

TRENTON, N. J., March 4.—Senator Frelinghuysen has somewhat modified his ideas, according to the bill which he has introduced in the New Jersey Legislature. It provides for the registration of cars and licensing of drivers, fixes rules regulating the use and speed of such vehicles, fixes license and registration fees and provides penalties, authorizes the Secretary of State to appoint twenty-five inspectors at \$3 a day each, and as many private citizens to act as special inspectors, gives State Commissioner of Motor Vehicles \$1,500 a year, in addition to his salary as Assistant Secretary of State, gives the chief inspector the same salary, provides for three days' license for tourists at \$1 each, and calls for persons residing outside the State to file address of counsel upon whom service may be made in case of accidents in this State.

It will be noted that there is no reciprocal registration clause, but \$1 a day is asked for what is designated as a tourist's license. It was stated that Senator Frelinghuysen had given assurances to several prominent New York automobilists that his new bill would include reciprocal registration.

AMENDED DENATURED ALCOHOL BILL PASSED.

WASHINGTON, D. C., March 2.—After a lengthy debate the Senate passed the House bill amending the denatured alcohol act, and it is now in the hands of President Roosevelt, awaiting his signature becoming a law. The object of the bill is to relax the Government inspection to permit the manufacture of alcohol for denaturing uses in small quantities along the lines of the German law. The new act is intended to satisfy the complaints of Western farmers, who claim that the original free alcohol law passed last year was so framed as to deny them the benefits which the legislation as originally planned was designed to confer.

An amendment submitted by the Finance Committee came near wrecking the bill. The object of this amendment was to require a Government storekeeper to be present during the entire period of distillation of spirits. It was pointed out that this would involve so much expense as to make the operation of the law impracticable in its relation to small distillers in agricultural communities. The amendment was lost, and then the bill was passed.

GOLD CUP TOURISTS WILL SAIL JUNE 20.

American autoists engaged in the 4,000 miles' tour through Europe for the American Gold Cup will leave New York June 20 on the *Provence*. The machines will be sent in advance on the French liner *St. Laurent*, sailing from New York June 7. Immediately on arriving at Havre the caravan will proceed to the Dieppe district to witness the Grand Prix race of the Automobile Club of France, after which they will begin their six weeks' run through the different countries of Europe. The entries already received for the tour include the Welsh, Thomas, Pierce, Cadillac, Packard, Stearns, Moore, B. L. M., and Columbia. Individual entries have been booked from Vancouver, Alberta, B. C., and Fort de France, Martinique. The entry list will close on May 15.

FOURNIER'S OFFER TO THE GOLD CUP TOUR.

Henry Fournier, well known in this country because of frequent visits here in years past, and now the manager of Paris-Automobile, 48 Rue d'Anjou, comes forward with the generous offer of providing free storage for the American cars which participate in the European tour being promoted under the direction of Georges Dupuy, now of New York City, but formerly of Paris. Mr. Fournier is the manager of one of the largest garages in Paris, possessing a capacity of 400 cars, and its location is decidedly convenient, being in the very central part of Paris. A special part of the garage, or a floor quite closed, will be provided for the American cars during their visit to Paris.

FORD HAS THE MOTOR TRACTOR IN MIND.

DETROIT, March 3.—Henry Ford has returned from a six weeks' vacation in California and Southern points. The rest was the first Mr. Ford has taken in six years. While in the West Mr. Ford looked thoroughly into the possibilities of motor traction, a phase of the motor industry that he has made a pet of the past few years, though he has said little on the matter.

"There are vast possibilities for motor traction in the West," said Mr. Ford, "were it possible to secure fuel at a reasonable rate. At the current price of gasoline, however, the outlook is none too bright, and there is no telling how far the price of gasoline will advance. Steam is used considerably, and giant ploughs that turn forty furrows at once are used in some cases on the plains. With fuel practicable at half the present cost, the motor traction phase of the industry would be practically unlimited.

For the present Mr. Ford will devote most of his attention to the construction of the six-cylinder racing machine that the company will send after the Vanderbilt cup this year. The plans are all ready and work will be commenced immediately. It is expected that the racer will be ready for the road in April. It is understood that the car will be turned over to Kulick, the well known driver, who will tune it up and probably drive it in the elimination. As the Wayne people also have just announced that they intend to enter a car in the Vanderbilt race this season, interest in this great classic will run high in Detroit. The Ford racer will be constructed of Vanadium chrome steel.

TWIN CITIES WANT A. A. A. TOUR START.

MINNEAPOLIS, MINN., March 4.—Minnesota is the latest claimant for the A. A. A. tour of 1907. The Minnesota State Automobile Association, recently formed, will urge the starting of the tour from Minneapolis and St. Paul, or from Duluth, if the Tri-City highway to the Head of Lakes can be completed in time. The Chicago-Twin City endurance run of 1905 furnished a substantial test of cars, although bad weather made the run unsuccessful in some of its features.

MISSOURI'S PROBABLE NEW AUTO LAW.

JEFFERSON CITY, Mo., March 4.—The Botsford automobile bill, requiring a State license costing \$5 and permitting the operation of an automobile anywhere in the State, was passed by the House to-day by a vote of 98 to 5. It is expected that the Senate will take similar action. The present law permits each county to require a license, and there has been no end of inconvenience.

WEBER BILL RECOMMITTED FOR A HEARING.

ALBANY, N. Y., March 5.—The Weber bill, which would require non-resident automobilists to take out New York State registration, was to-day recommitted to the General Laws Committee of the Assembly for a hearing. The impression prevails that the bill will never become a law, unless it is urged by the New York State Automobile Association, which at present is antagonistic to the measure.

N.A.A.M. DOES NOT DESIRE ASSOCIATE MEMBERS.

Associate members of the National Association of Automobile Manufacturers have received a communication from the Executive Committee, stating that it is the desire to abolish the associate membership and make the organization one of active members exclusively. It is stated that the manufacturers of automobiles feel that the association can render no service whatever to associate members. Therefore resignations are being solicited.

CHAIRMAN HOOPER, TO REPRESENT PENN.

Robert P. Hooper, Chairman of the A. A. A. Good Roads Board, has been appointed by Governor Stuart, of Pennsylvania, to represent that State in the annual convention of the American Road Makers' Association, at Pittsburg, March 12-14.

GEARLESS TO MAKE ITS DEBUT AT THE HUB

OWING to the fact that the show at the Hub usually marks the wind-up of the show season in this country, it is generally productive of a number of new things that could not be gotten ready in time to exhibit at the earlier shows. Two of these that will be uncovered for the first time during the event



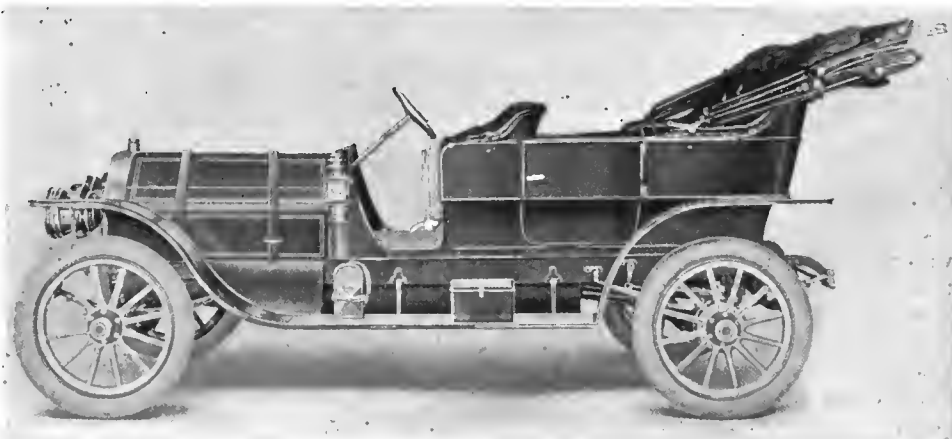
THE RADIATOR.

that will hold the boards for the week beginning next Saturday are the Gearless touring cars. Taken as a whole, both these cars are something in the nature of a novelty, as they have never been publicly shown before, and, in fact, have only been completed in time to be included in the Boston show, but their chief distinguishing feature—the gearless transmission—is something that has been before the trade for some time past and has demonstrated its utility in a satisfactory manner. In addition to this feature, they embody a number of novel points, which it is confidently expected will cause their entrance on the market to be something in the nature of a sensation to the trade. They are the result of two years' steady work and experimenting on the part of the Gearless Transmission Company, Rochester, N. Y., and will have the distinction of being the highest powered cars on the American market for the price. Their builders will have the further distinction of being the only manufacturers in the country devoting their attention to both the two and four-cycle types of engines, one of each of the cars to be staged being of these differing types.

Model 60 is the two-cycle type and is a 60-horsepower car, equipped with a four-cylinder, two-cycle engine, the cylinders of which have a five-inch bore and five-inch stroke. Particular attention has been paid to the matter of ignition, and after much study both the plugs of the duplicate systems with which the car

is provided, have been placed at the side of the cylinder, quite close to the top, rather than directly in the head itself, as has been customary with the majority of designers. This location has been found to be one that insures the proximity of fresh mixture to the plugs and consequently facilitates the spread of the explosion, with a corresponding increase in the power developed. One set of plugs is run from a standard high-tension equipment, employing accumulators as the source of current, and the other set, entirely independent of the first, is run from a magneto. The motor has been demonstrated to have a capacity of fully 60-brake horsepower on the test block.

The makers are not ready to give full detailed information of the design of the engine at the present time, but wish it understood that it is a motor of the two-cycle type, free from those defects thought to be inherent in this class of engine. It is said to be extremely flexible and responds to the throttle to the same degree as a four-cycle motor. Another distinguishing feature of this car is the transmission, which, as already mentioned, is gearless, but which does not, however, employ any friction disks, its



GEARLESS MODEL 60, WITH FOUR-CYLINDER, TWO-CYCLE MOTOR.

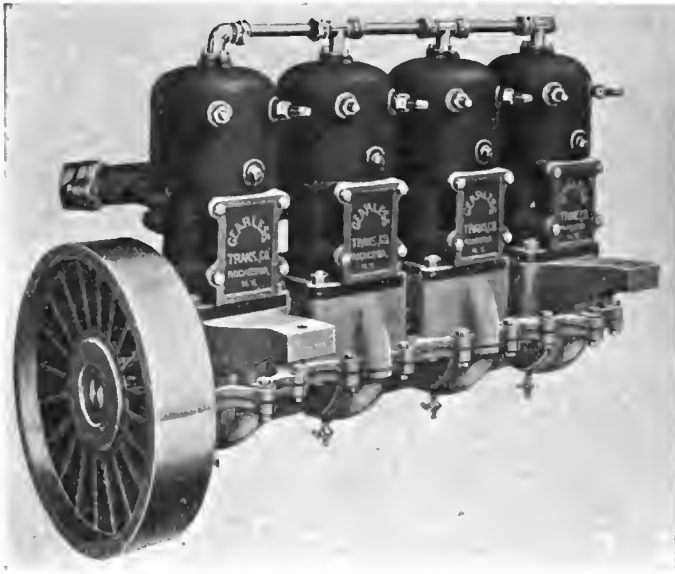
simplicity being such that but three moving parts in all are required. A full technical description of this will also be given in connection with that of the engine itself. The car has a 124-inch wheelbase, with 36 by 4-inch wheels, and in every respect embodies only those features of design, construction and materials that have come to be considered as standard by the best known designers.

The other car to be shown is no less a surprise, in that it marks an addition to the six-cylinder ranks. It is known as Model 75, its power plant consisting of a six-cylinder motor, the dimensions of which are 4 13-16 inches by 5 1-2 inches—an unusually large engine for one of the six-cylinder type, so that although its official title is as given above it will be popularly known as the "Gearless Great Six." The motor has a capacity of 75-horsepower at a moderate speed. As its name indicates, this car is also equipped with the gearless transmission described above, and is along the same general lines as the two-cycle car, except that it is somewhat heav-



MODEL 75, GEARLESS, HAS SIX-CYLINDER, FOUR-CYCLE MOTOR.

ier in construction throughout, the wheel base being 128 inches and the wheels 36 by 4 1-2 inches. Both cars are provided with extremely attractive straight-line bodies, comfortably seating seven passengers in the case of the latter, extra revolving chairs



SIXTY-HORSEPOWER, TWO-CYCLE GEARLESS MOTOR.

being used in the tonneau. The 60-horsepower two-cycle car lists at \$3,250 and the "Gearless Great Six" at \$4,000, both in complete running order and with the usual equipment of accessories.

CHICAGO MOTOR DISPATCH'S ARRAY OF LOGANS.

CHICAGO, March 4.—Twenty model N Logan light delivery wagons are being used exclusively by the Chicago Motor Dispatch, these being received recently from the factory of the Logan Construction Company at Chillicothe, O. These cars are all painted in dark wine color, with gold stripes and lettering, consecutively numbered. Their appearance is businesslike.

The object of the Chicago Motor Dispatch is to handle parcels and packages accurately and rapidly in Chicago, the company consisting of five men of experience in the express business. The parcels are first called for by a force of pick-up wagons and taken to the Motor Dispatch's clearing house at 347-349 Wabash avenue, and there sorted for delivery to all parts of the city. Before the end of the year the Motor Dispatch expects to double its number of Logans, for the tributary business interests in Chicago express much satisfaction at the excellent service supplied by the motor route. John D. Maus, for nineteen years associated with Kelly, Maus & Co., is the president and general manager, the other directors being J. Brown, Jr., vice-president; Graham F. Duffield, secretary and treasurer; Ralph A. Bond, and Vincent Walsh, all of whom are experienced in this line.



LOGAN LIGHT DELIVERY WAGONS, BUILT FOR THE CHICAGO MOTOR DISPATCH, READY TO LEAVE FACTORY AT CHILLICOTHE, O.

CASWELL BECOMES HEAD OF INTERSTATE CO.

At its second annual election, held at the company's offices at 1931 Broadway, last week, Louis S. Caswell was elected president of the Interstate Automobile Clearing Company. The other officers are James Geary, vice-president; James M. Carples, secretary, and F. I. Hauptman, treasurer, the directors being William B. Thom, William E. Metzger, William J. Dixon, John Slattery, Herman F. Cuntz, Charles A. Wardle, James Geary, F. I. Hauptman and L. S. Caswell. In its operations this concern holds a unique position in the automobile field. It neither buys nor sells cars though its dealings are entirely in used cars. What it does do is to find buyers for those who wish to dispose of second-hand cars, and cars for those who wish to acquire one that has already seen service, thus doing a purely brokerage business, but covering the entire country. A registration fee is required to cover the cost of advertising and a small commission is charged the seller on the amount for which the car sells. Both buyer and seller are accordingly benefitted.



CONTINENTAL CAR AND DESIGNER JOHNSON.

THE NEW CONTINENTAL AND ITS DESIGNER.

One of the latest entrants into the field is the new Continental, a car of foreign design, which will claim New Haven, Conn., as its home. The photograph shows C. S. Johnston, its designer, at the wheel, about to start out on a 100-mile test over the snow-covered roads. With him in the new roadster is E. W. Bean, consulting engineer, and standing beside the car is S. R. Ryman, master mechanic of the University Automobile Company, of New Haven, which is undertaking the construction of the new car. This concern, of which Mr. Johnston is president, is also agent for the Wayne cars and expects to be able to supplement these with the new productions of his own creations in time to make deliveries for the coming season.



THERE WERE MANY SNOW COVERED MILES WHERE THE CAR WAS LET OUT INTO ITS GREATEST GALLOP.

THE SNOW-BLOWN STORY OF A WINTER TRY-OUT

By A. PASSENGER.

“HIRAM” was what we christened the 1908 Packard experimental car after we had braved the snow and the cold for a 606-mile round trip between Detroit and Chicago. “Hiram,” or, as he was then known, “Number One,” had scampered over the boulevards of Detroit for about a month, and there was considerable curiosity concerning his ability to trip over the nerve-racking highway which connects Detroit with Chicago. A run was arranged. The pilot was Sales Manager Waldon, who has driven experimental Packards over that particular road of jolts and jars so often that he ought to be able to write a syncopated poem about it. Four of us of the proletariat constituted the ballast-pneumatic-tire Red Cross corps.

It was before 6 o'clock and the sun was still abed when we gathered at the Cadillac Hotel. Waldon's fur-framed face, as he burst into the warm lobby, was serious. Seated at the greasy table of an all-night dispenser of coffee, rolls and once-eggs, we talked over the chances of the road ahead of us. There was no recent report on which to build a prophecy of any kind and the only visible sign was a void of wintry desolation and darkness.

Michigan avenue was wrapped in a cold chill. It is fashionable now to listen to the “Call of the Wild,” and make your friends think you are a regular wolf-dog, impatient to dash across the snow and through the ice-mantled forests. However, there is a yellow streak in a soul accustomed to steam heat when it comes to choosing between a fine hotel and a wind-swept snow road about five-fifty of a winter morning.

We Got Back to Nature.

Back to nature? We certainly got back that day and the next and the next. For the first few miles along the macadam leading out of town there was much levity. We discussed the car we were in and guessed at things to come. In the growing light we caught glimpses of ourselves in shop windows which shot rearward. It was not a pretty car and one would little think it the first impression cast in the mold of the future season. The body was passé by a couple of seasons, and fitted its frame much as some of our borrowed furs fitted ours.

A few hardly curious and very sleepy early risers watched us rush out of town. We fidgeted around in the tonneau, adjusting our bulky shapes and the paraphernalia of touring which reposed on the floor. We divided the task of record keeping into looking at the speedometer, at a watch, and at making marks on a 5-cent

note book. Soon we settled into the half slumber that follows too early awakening and let the vigilant Waldon study the long stretch of tiresome perspective leading into farm land.

The cold brought us back to life. The day was full born but gray and drear. We were apparently alone on the face of the earth. Waldon said it was our duty, in the tonneau, to wave at all farmers we met. We looked hard for farmers to wave at. The watchkeeper hunted in his voluminous clothes for the timepiece that he might note our arrival at a town. His right fur mitten was picked up by the wind and carried overboard. Waldon laughed and we flew onward. A mile further down the road I lost a mitten trying to write Ypsilanti in the note book as we jostled along about 55 miles an hour.

A Panorama Painted by Jack Frost.

We were in real farmerland now. Rolling ground gave us a wide panorama painted by Jack Frost in blinding white. The snow was on everything but us. Only in the far distance, where irregular lines of trees rose to partially obscure the horizon, was there anything not white. The sun flirted shyly with the landscape and cast opaline pictures upon the great white screen. It did not warm except in appearance. The cold penetrated with a sharpness that cut through fur and sweater. We began to hunt for the warm corners of the tonneau. There was great simplicity and beauty in the wonderful white vista before us. But even the crisp crunching of dry snow under our flying wheels lost its music and became the chant of a frozen elf who tormented us.

The sun lost itself behind a bank of grey evil clouds. The opals vanished. The snow deepened. The houses seemed farther apart, forlorn, deserted. Everything was bleak. Hills rose and sank as the road climbed icy, wind-blown summits and dropped into uncertain hollows where the snow might be a foot or a mile deep. We wallowed in the drifts and slid over the slippery, rough swept places. The wind beat the drifting snow against our faces. It felt like the sharp prick of a thousand needles and often we would touch our faces as though to wipe the blood away. Waldon told a funny story. I never knew whether this was a bluff or whether he was really immune to the gale of snappy frost.

The Road Was Ours Alone.

It was time that we should meet the pious farmers on their way to the country church. We did not meet them. The road



MORGAN.

FREDERICKS.

WALDON.

LOOMIS.

ESTEP.

was ours. Rural Michigan worshiped by its own cook stove that raw Sabbath day. We could not guess at the time. The sun shone from nowhere. Only occasional glances at the watch as we passed through towns guided our calculations of the day's progress. The speedometer told us that we were reeling off mile after mile at express speed; for all that we slid on the ice and struggled rudderless in the snow.

At Coldwater we took on gasoline for safety's sake, although there was plenty in the tank and we had a ten-gallon can in the tonneau. We stretched our legs and clapped our hands and stumbled and rolled into the hotel to get rid of a little of the sting before we started again.

All that morning and in the afternoon the flight across the drear waste of a snow-buried country continued. We ran through an area where it had melted, but was now freezing again. The cold was augmented by our windy dash through it. A dirty mixture of sand, clay, and melting snow was hurled up at us in a constant stream, striking car and passengers alike and freezing where it struck. Soon we were ice-coated from end to end, enameled in frozen mud. The steering was difficult now. Not only was the pathway fickle, but the steering gear was encrusted with ice and its lubricating grease frozen into solder.

Struck the Deep Drifting Snow.

As we worked our way out of this district of slush we struck again the deep drifting snow. The road was buried. Only the trees and the fence tops outlined the highway. There was one long wavering stretch which I remember, where it seemed as though we were striking across a desert or that we were on top of some once-inhabited region now buried beneath its great burden of snow. We ran into a valley and crossed and recrossed the St. Joe river. The bridges creaked and groaned. The trees along the low edges had been inundated. The water was gone but had left a collar of ice around each tree. The only simile I could think of was the immaculate ruff of Sir Walter Raleigh. That reminded me that I had not smoked since leaving Detroit. By blowing the smoke through my nose I discovered that I could warm the whole front of my face.

Pretty soon the landscape lost its wild, frozen charm and became human with brick pavements, trolley wires and houses with lace curtains. It was Elkhart, but Waldon never hesitated. There was a momentary warm breath and then once more the icy blast of the open country struck us. We nearly passed a corner that should be turned. The steering was now frozen so stiff that both of those in the front seat had hold of the wheel. They yanked and tugged at it. The car came round but came too slowly. Then we stopped—in a snow drift a few feet deep by a fence. We kicked the snow around and shoveled it out with a corset sign that belonged on a fence in a warmer clime.

Once more on the road, we sank again into reveries and our furs. Waldon and his companion of the front seat struggled with the wheel but did not let up on speed.

Bang! We Knew That Sound.

Bang! We came up out of our furs and our reveries. We knew that sound. There may be the stimulus of excitement when changing a tire in the Vanderbilt Cup race. You never

really curse the rubber industry in your heart until you fix a tire on a snow-drifted, windy country road.

We were close to a house and drove the car into its yard, where we started to work on the lee side of a hen-coop. This small protection was but a frost-bitten farce, so we drove into a brick yard further back. Here we found four walls of red brick, just baked and pretty. There was no roof, but there was charcoal. We borrowed it and made a fire.

While part of the crew put in a new inner tube the rest of us heated irons which we found and, after knocking off the mud encrusted on the steering gear moving parts, thawed out the frozen bearings and got the car so it handled with its usual agility. We recommenced our journey warmed, good-natured and only a little delayed. We had been making good time all the morning, and were now somewhat used to the cold and felt the importance of our ride in this, the first 1908 car. But hardly had we started when there was symptom of fuel trouble. In other words, the engine stopped. Back into the brick yard, and we heaped more charcoal on the dying fire. Investigation showed that, during the tire repair, water which had been in the gasoline had frozen in the small filter-well below the carbureter float chamber and in the lower gasoline pipes.

Had Eaten the Last Sandwich and Pickle.

While we thawed out the frozen parts the afternoon became more gloomy with each departing minute. The sun had not been seen for hours, but we knew it was sinking behind the great streaked fresco of dull grey and ochre that told which was west. We were hungry. Long since we had eaten the last sandwich and the last dill pickle. We struck the brickmaker's house for supper and got it. Sitting around that kerosene-lighted table; our faces unwashed and streaming with melting mud; our clothes, eskimo-like in their rotundity; our furs steaming on chairs and making pools of water on the white kitchen floor; three men, the tired wife of one of them, and a little girl eying us curiously as they made a hesitating bluff at swelling the conversation, we almost became sentimental.

We figured over the chances of making Chicago that night. Ingenuous Fredericks called our attention to the fact that the hotel at South Bend was one of the finest in the West. The hint was laughed at, but finally acted upon. The road had been a tiring one to drive by day. It was a dangerous one to drive by night. At the Oliver we washed our abused faces with vaseline, and then went to bed—there to toss and dream for a few brief hours of snow and ice, punctured tires, brick yards and fleet miles.

The next day was not so arduous. The cold still fought our wraps and succeeded fairly well in reaching the channels of our sporting blood. But the sun was in and out among the cumulus clouds that stood in bold relief before the sky of baby blue which belied the weather. The roads were smoother now, for we were in a region which Hoosier farmers had macadamized.

We were welcomed at Hobart by a carful of Chicagoans, and we raced the '07 and the '08 over the glossy dangerous roads.

We Did Not Stop at Chicago.

We did not stop at Chicago nor even get out of the car, but started back for South Bend and reached it in mid-afternoon.

Immediately we fell to on the first square meal we had had since Detroit. In the evening we regaled the garage man and some of his friends with our experiences and with tales of other cross-country chases made by Waldon.

The following morning, as we lined up at the long counter of a restaurant with a "Never Sleep" sign, we knew that it was colder than either previous day. But we were by this time veterans, and we dashed out of South Bend with that renewal of form which always accompanies the beginning of the last lap. Waldon at the wheel must have felt it too. We in the tonneau raved about the frozen scenery along the St. Joe. We talked about previous and summer rushes over this Chicago-Detroit road and calculated the chances of smashing Waldon's round trip record of 22 hours 50 minutes, or 20 hours 36 minutes running time. We were gay and giddy. So excellent had proven the riding quality of the new springs that we were bumping over the rough roads as though on a cup race course. "Thank-ye-marms" we laughed at, but, of a sudden, we all hit the sky together and nearly missed the car when we came down. The cause was one of those combination cross ridges and depressions which some farmers imagine are necessary to prevent hill roads from washing out. A quick, sharp snap told of a broken spring, the left front one. The top leaf was gone near the axle clips. We drove along carefully for several miles until we espied Mottville, in Michigan, which has four houses, one blacksmith shop and a general store.

We welcomed the blacksmith shop and were welcomed by it. Mr. Mott was genial and a good smith. We needed strap steel to fix the spring and hunted through a pile of scraps beneath a bench until we found two pieces a couple of inches wide that would just serve our purpose. Mr. Mott laid them on the anvil, put the cutting hammer on the spot we indicated and with a savage blow of the knocking hammer cut the piece in two. He marked the other and raised the hammer, but stopped with it poised mid air, and ejaculated:

"By catnip! If them ain't those there gosh-blamed irons that Hi Smith brung in to fix up his plaw with!"

It was surely a "horse" on Hi, and it inspired us. That was the name of which we had been trying to think—true of the country, a name fitting this unnamed car which for three days had struck about as close to the heart of the countryside as you will ever get in an automobile. So we christened it—properly, with a half-empty bottle of chill-eradicator.

Backing out of the "Mottville Garage," a front wheel hub caught on the corner of the anvil and the aluminum hub cap was broken off. We stuck the garage tin cup over the end of the hub, wired it on and were soon away down the road.

It started to thaw about noon, and then to freeze again, so that we got a third layer of that conglomerate mass of chill thrown up from the road. We saw the places where, on Sunday, we had splashed mud all over the clean white sheets along the sides of the roads. We saw, in cold storage by the wayside, a chicken we had hit. We met a chicken that was alive until then. Afterward the speedometer stopped, but we did not learn the cause until we reached Detroit and looked at the front of the car. Then we found that the chicken had been traveling *in-cog*.

It was about 3 o'clock when we struck the center of Detroit and turned onto the boulevard for a final burst of speed. It was just as cold as ever, but we turned down our collars, primped a bit generally, and tried to look swagger as we drove to the factory home. There Waldon steered the car on the elevator, we were hoisted to the second floor, and ran, mud and all, into the experimental room, where nearly all the factory jokers gathered to pass comment on our appearance and ask leading questions concerning the weather, roads, and all the rest of it. It had been a great ride, but only the first. The car and three others, now being made, must go more miles—miles by the thousands—that qualities which are new may be tested on the rough road before they become standard. Even now is "Hiram" wallowing in the melting-freezing mud between Detroit and Cleveland under the guidance of Russell Huff, chief engineer—while Loomis sits in the warm drafting room figuring the price of a new pair of mittens on his wonderful guessing stick.



A GLIMPSE INTO ONE OF THE DEPARTMENTS OF THE IMMENSE NEW FACTORY OF THE GEORGE N. PIERCE COMPANY AT BUFFALO, THE PIERCE GREAT ARROW IS MADE.

BRIEF ITEMS OF NEWS AND TRADE MISCELLANY

W. H. Hotchkiss, president of the American Automobile Association, has just made his choice of an automobile for 1907. It is a Thomas Forty touring model.

The Fish Automobile Company of St. Louis, Mo., has given up the old McGirt foundry on South Center street and has moved to the Apex Manufacturing Company's building.

Several Fort Wayne capitalists are interesting themselves in the probable establishment of an automobile factory in that city to be run as a branch of the Buckeye Manufacturing Company, makers of the Lambert, at Anderson, Ind.

Pleased with past results, the Studebaker Automobile Company will fit every 1907 car with the Truffault-Hartford shock absorber, and has just completed the necessary agreement with the Hartford Suspension Company.

A receiver has been appointed to take charge of the affairs of the Clarke Automobile and Launch Company, of Jacksonville, Fla. The petition and bill filed by D. H. McMillan states that the company is hopelessly insolvent.

The exact location of the new factory which the Rainier Company will build in some Middle Western city has not yet been decided upon, despite reports to the contrary. Detroit was mentioned erroneously as having been the selection and a factory site acquired.

A new line of Oval horns in various sizes and of very deep penetrating tone has been placed on the market by the Automobile Supply Manufacturing Company, of Brooklyn. These horns have met with such approval that the company's two factories are working overtime to meet the demand.

The Pennsylvania Railroad Company is now experimenting with automobile baggage trucks for use in the Union station at Pittsburg. They are of extra heavy construction, and can be run by merely touching a button. Four are now employed at Philadelphia, and have proved such time-savers that the authorities think it is profitable to extend their use.

William H. Mead, manager of the Chicago branch of the Buick Motor Car Company, has leased the entire second floor of the Winton building, at Michigan avenue and Fifteenth street, and will use it for retesting and reshipping Buick cars to the out-of-town agents within his jurisdiction. Owing to the extension of business ground has been secured for the erection of a new building just south of the Franklin agency on automobile row.

Although the H. H. Franklin Manufacturing Company has just completed a five-story addition, it is apparent that more space must be secured, and arrangements are being made for obtaining additional room in other buildings in the near vicinity. The fact that the company must provide for the output of the commercial vehicle department is a consideration of the near future demanding additional space, which is not obtainable in the present factory limits.

A dealers' association is under formation by the automobile trade of the Newark, N. J., territory. At a recent

meeting the matter was thoroughly discussed and a committee appointed to consult the automobile trade and create an interest in the project. This committee consists of James W. Ward, C. S. Calvert, Frank E. Boland, Raymond S. Joo, W. H. Rickey, Frederick Hinni and John Beldon. All members of the automobile trade will be eligible for membership.

An involuntary petition in bankruptcy has been filed against the Four Wheel Drive Wagon Company, of Milwaukee, Wis., by three creditors, the Rundle & Spence Manufacturing Company, Siekert & Baum Stationery Company, and the Cream City Can Works. The petitioners allege that the company admitted its insolvency January 1, and signified its willingness to be declared bankrupt. The liabilities are said to be \$190,000, and its assets \$101,500. The company has not operated its plant for two months.

To visit the mammoth new factory in which the White steamers are made, Carl Page ran a "personally conducted" tour to Cleveland last week, in which twenty of his associates from the various White garages in the New York territory participated. The party chartered a private car which was attached to the Lake Shore Limited. Arriving in Cleveland in the morning, they were met by Walter C. White and a squadron of White cars, and were driven to the Union Club for breakfast. Practically the entire day was spent in inspecting the new factory. At the close of the day the White private car was attached to the Pennsylvania Limited, and the party returned to New York, more than ever impressed with the fact that they were a part of one of the great industrial organizations in the country.

Although his plan to create a convincing piece of advertising literature, extolling the Autocar, miscarried through no fault of his own, Fred P. Brand, general sales manager of the company, gained a new slogan. The Autocar is now "the car that takes you there and brings you back." Mr. Brand thought a booklet of testimonial letters from some Autocar users would be interesting, and communicated his ideas to the Autocar agents throughout the country. As a result, he was fairly overwhelmed with letters, more than 500 being received, making it out of the question to use all or even give a fair idea of the number sent in. So many of the writers concurred in calling the Autocar "the car that takes you there and brings you back" that the coincidence was striking.

In the new Columbia four-cylinder gasoline car with electric transmission, which attracted so much attention at the New York and Chicago shows, the revolving field generator serves the purpose of a clutch and transmission, the full driving effort being exerted by the engine directly to the driving pinion. The driving shafting extends along the center of the frame to the rear axle and three ball bearings are the only frictional parts between the engine and the rear axle. Owing to the elimination of the friction incident to the ordinary types of transmission, the hill-climbing

powers of this car are remarkable, and its adaptability to the varying conditions of road traffic, owing to the ease of control and simplicity of the entire apparatus, makes it considerably faster than its 45-horsepower rating would indicate.

NEW AGENCIES ESTABLISHED.

The Bartholomew Company has contracted with W. J. Brown, of Wellman, Ia., for the sale of the Glide in Washington and Keokuk counties.

A Haynes agency has been established in Brooklyn, N. Y., with the Borough Automobile Company, on Palmetto street, near Bushwick avenue.

The Chicago agency of the Detroit car has been placed with the Garfield Park Automobile garage, of 1891 West Harrison street.

The Eclipse Automobile and Construction Company has opened a large garage at Williamsburg, N. Y., in the former Empire Theater building. The agency for the Smith machine is located here.

The new California automobile, the Tourist, built by the Auto Vehicle Company, of Los Angeles, is now being handled in San Francisco by the Auto Company of California.

The latest addition to Philadelphia's automobile agencies is the Philadelphia Motor Car Company, now located at 236 North Broad street. The new company represents the St. Louis Motor Car Company, of Peoria, Ill.

Alfred Reeke, who for the past few years has been treasurer of the Orlando F. Weber Company of Chicago and Milwaukee, severed his connection with that concern on March 1 and has arranged to open an agency of the Wayne Automobile Company of Detroit, in Milwaukee.

RECENT BUSINESS CHANGES.

The Central Manufacturing Company, of Connersville, Ind., manufacturing buggy and automobile bodies, has voted an increase of its stock from \$50,000 to \$100,000.

The Toronto Automobile Company, located at 10 East Adelaide street, Toronto, has absorbed the Automobile and Supply Company (George H. Gooderham). The latter's garage and show rooms will be continued and the new premises closed up.

The partnership between Palmer & Christie has been dissolved and a new company formed under the title of the Martini Import Company. The directors are F. B. Palmer, C. F. Palmer and Joseph B. Freeman. Martini cars will be handled exclusively. The salesrooms of the company will remain as before at 239 West Fiftieth street.

D. D. Martin, general manager of the New York-Broadway Rubber Tire Company, located at 1186 Bedford avenue, Brooklyn, has removed his entire tire department to the second story of the building, and on the ground floor installed a complete line of accessories and supplies in charge of James F. Fairman,

recently with Smith & Mabley, Inc., of New York.

The O. H. Dietrich Company, Ltd., of Allentown, Pa., has been incorporated under the name of the Dietrich Motor Car Company, with garage and sales-rooms at 24 and 26 North Tenth street. Twenty-five thousand dollars is the fully paid in capital of the company. The officers are: President, G. J. Heintzleman; secretary and treasurer, O. H. Dietrich; directors, O. H. Dietrich, G. J. Heintzleman, Valentine Guldin and William T. Leh. Franklin, Cadillac, Buick and Thomas cars are handled.

PERSONAL TRADE MENTION.

Joe E. Yowell has been appointed manager of the Southern Automobile Company, of Nashville, Tenn.

F. C. Hoblitt, formerly of the Aerocar Company, Detroit, has become connected with the American Locomotive Motor Car Company, Providence, R. I.

Charles Coddington, for some time manager of the Southern Automobile Company, has left that concern to take up the management of the Capital City Automobile Company, of Atlanta, Ga.

James G. Heaslett, formerly of the Garford Company, of Elyria, O., has entered the employ of the Rainier Company, of New York, as chief engineer and designer.

THIRTY CARLOADS OF BUICKS.

What is probably the largest single shipment of automobiles ever made is depicted in the illustration herewith of one train load of Buick motors under shipment to the Pence Automobile Company, Minneapolis, Minn. There are thirty carloads in the train, consisting of ninety automobiles, the total valuation of which is \$112,500. Big as it is, the shipment constitutes less than one-third of the total number of cars ordered by the above named company, their total allotment for the season being three hundred, made up of two hundred and fifty two-cylinder models and fifty four-cylinder models. The Buick Motor Company factories are all working to their full capacity, and extensive building operations are under way at Flint which will double the capacity at that point. Among other important additions there is to be a new drop forge plant and a plant for malleable castings. These will be ready in time for the 1908 business.

TRADE PUBLICATIONS RECEIVED.

The latest folder from the H. H. Franklin Manufacturing Company, Syracuse, N. Y., describes type G Franklin runabout, a smart-looking little twelve-horsepower machine which, as the folder has it, "suits the highest runabout ideal like a glove."

From the Berkshire Automobile Manufacturing Company, Pittsfield, Mass., is to hand a sixteen-page handbook on that firm's Model D touring car. The history of the machine and its distinctive features are related in text and cuts, gotten up in the neatest style.

Garvin motor-driven machine tools are illustrated and described in the unpretentious little booklet issued by the Garvin Machine Company, of New York City. The list here given is not exhaustive, but it shows the most important models handled by this firm in plain milling machines, vertical spindle milling machines, hand drilling machines, Garvin profilers, die slotters, automatic tapping machines, and hand lathes.

There is a considerable amount of useful information in the booklet bearing as its title "Clinchers" and issued by the Continental Caoutchouc Company. It gives sizes of tires in American and metric measurements, prices, history of the Continental firm in its native city of Hanover, Germany, and its doings in its adopted land, as well as a list of agencies throughout the world. There are some useful hints on the care of tires, weights which various size tires will carry, and information on the making of temporary repairs. Any automobilist can secure a copy of the booklet on request to the Continental Caoutchouc Company, 2100 Broadway, New York, or their various branches.

There is some interesting reading in the neatly produced booklet by Frank P. Illsley on the "Six-Cylinder Situation in Europe." It contains a large number of clippings from European automobile journals, and from the European correspondents of American motor papers, on the six-cylinder situation. For the man who has not had time to study the six-cylinder proposition and who is not well acquainted with what is being done in this line of motor construction, the booklet provides useful up-to-date information. The Stevens-Duryea Company has something to say on its share in the six-cylinder movement, but the compiler of the brochure has sought rather to give information on the subject in general than beat the big drum for any one firm.

The "International Girl," a copyrighted reproduction from the original painting by Abbey Alston, is the attractive head-piece of the International Rubber Company's (Milltown, N. J.) publication on tires. The literary work of the booklet is a setting forth of the qualities of International tires and their methods of construction. A price list of International tires is included in addition to a table showing the carrying weights for different size tires. From the same company has been received a life-size reproduction in colors of the painting—the "International Girl." It is a well-produced piece of color printing, and doubtless members of the trade will be glad to avail themselves of the offer of the International Rubber Company and obtain the hanger on sending twelve cents in stamps to cover postage.

ELCO MOTOR BOATS.

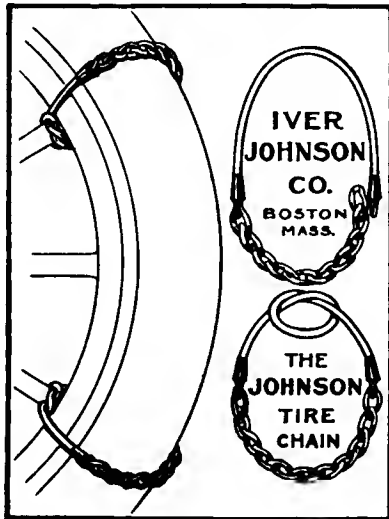
Probably there is no better known make of motor boats along the entire Atlantic Coast from Maine to Florida than those which bear the "Elco" mark. Not being wedded to any particular school or system, their builders, the Electric Launch Company of Bayonne, New Jersey, are impartial advocates of steam, gasoline and electricity and are well known as the creators of exclusive designs using each power, a large number being in service round about the waters adjacent to New York. Their name has become more closely associated during the past few years with the speed type of boat—more popularly styled the automobile boat, in that it has been designed with a view to rendering about the same class of service on the water as the automobile does on land. These boats are built in sizes ranging from 26 to 40 feet over all, are equipped with the standard multi-cylinder type of automobile motor of the latest design and of powers sufficient to give speeds ranging from 15 to 30 miles an hour. The engine is placed forward under a hinged hatch, permitting of ready accessibility to every part and leaving the entire cockpit free for seating room, which is generally taken advantage of to use wicker arm chairs. This firm has become even better known as builders of speed launches and large cruising yachts, after the plans of some of the best-known yacht designers—boats that have become famous for their performances in contests or for the luxury and ingenuity displayed in their arrangements and equipment. They are about the only builders who have made a specialty of electric launches, to which they have devoted considerable of their attention for quite a number of years.



RECORD SHIPMENT OF BUICKS EN ROUTE FROM FACTORY AT FLINT, MICH., TO MINNEAPOLIS, MINN.

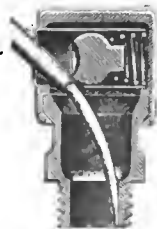
INFORMATION FOR AUTO USERS.

Tire Chains.—The Johnson Tire Chain is designed to supply the demand for a light weight and low-priced device that will prevent loss of traction in snow, sand and mud. There are no side chains. The other members, however, hold the traction members in operative position, each being a unit, held in position by the spoke. This construction does away entirely with any trouble resulting from the failure of any one part. Owing to



the peculiar method of fastening to the spoke, all side and other slipping is effectually prevented, giving a unit structure that is self-retained in such a manner that no part is lost when any member is worn through by use. This is the only chain traction device that can be readily applied without either jacking up or moving the car, thus making it a very simple matter to apply in emergencies, such as being hung up in the mud, snow or sand spot. It has been shown by actual practice that six of these chains on each rear wheel give sufficient traction for all ordinary work, although twelve can be used, or one to each spoke. As they are easily and quickly applied, they may be carried in the tool box, and used only when necessary, in this way saving much wear, and removing every excuse for leaving the same on wheels when the roads are good. It is made in sizes adapted for all tires from 2 1-2 to 5-inch, and, as it is designed to fit loosely, does not injure the tire.

C. F. Tucker, Hartford, Conn.—Dust and grit are such penetrating substances that they will find their way into any unguarded oil hole on the car, no matter how small it may be, nor how well pro-



CROSS SECTION OF TUCKER VALVE.

TECTED it appears to be. Moreover, the rapid motion, particularly of any revolving parts, tends to throw the oil out, so that it is impossible to keep a supply of

oil on such parts. The necessity for continually digging mud and sand out of such holes every time it is necessary to oil them, is a nuisance, and to avoid it, as well as to protect the bearing, a device such as the Tucker oil hole cover and cup, which has been on the market a number of years, should be employed. As will be seen in the cross-sectional illustration, these cups screw firmly into the oil hole and are provided with a filler vent at the side near the top, which may readily be opened by revolving the top with a screw-driver. They hold sufficient oil to lubricate such bearings as they are required for many hundred miles, and not only stay where placed, but add to the appearance of the car.

Cushion Springs for Autos.—One of the first firms to enter into the manufacture of cushion springs for automobiles in this country was the Charles Wing Company, of Amesbury, Mass. The company is now making a specialty of the "Wing" cushion spring adapted for all descriptions of vehicle seats, but specially suitable for automobiles. The cushion spring is strongly constructed, makes a very easy riding seat, and stands up under hard usage and heavy strain. A full line of auto trimmings is carried.

Improved Oil Can.—In addition to the barrels, half barrels, and five and ten-gallon cans of lubricating oil, the A. W. Harris Oil Company has now on the



market a very desirable one-gallon decorated package which has what is known as the coalhod spout with screw cap. This addition, the usefulness of which will be appreciated by all who have filled an oiler from a large can, is also used on the five and ten-gallon cans. The one-gallon package is particularly handy for both the individual user and the retail trade.

C. F. Iszard, Germantown, Philadelphia, Pa.—Despite the great number of speed and distance-recording devices that has been placed on the market during the past few years, none had been devised to produce a continuous record until the appearance of the Recording Auto Speed Meter, the mechanism of which is illustrated by the accompanying illustration. The operating mechanism is the same as that ordinarily employed, i.e., a striker revolved by one of the front wheels and a flexible shaft. A clock movement is supported on a stationary shaft, around which it revolves, carrying a drum holding the record sheet. The clock is geared to revolve four times in twenty-four hours, and is so mounted that each revolution causes the record chart to move horizontally a quarter

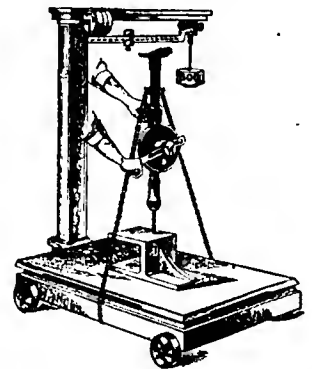
inch, making the record of each period of six hours entirely distinct. Mounted in the center of the gear is a shaft, having at its end a cam engaged with a pen lifter, so that at the completion of each mile the pen drops and records it. This gear can be disengaged and turned by hand so that the machine may be set at



ISZARD RECORDING SPEED METER.

the starting point whenever desired. The fountain pen holds sufficient ink for a week's running and is of non-corrosive metal; it is suspended on a flexible band, so that no amount of jarring causes it to make a false record or spill the ink. The construction throughout is made very rigid, so that the jarring cannot disturb the clock movement or derange any of the mechanism. The inclosing case is either of mahogany or aluminum and its outside dimensions are only 5 by 4 by 3 inches, requiring but a small space on the dash. It is the invention of C. F. Iszard, and is patented.

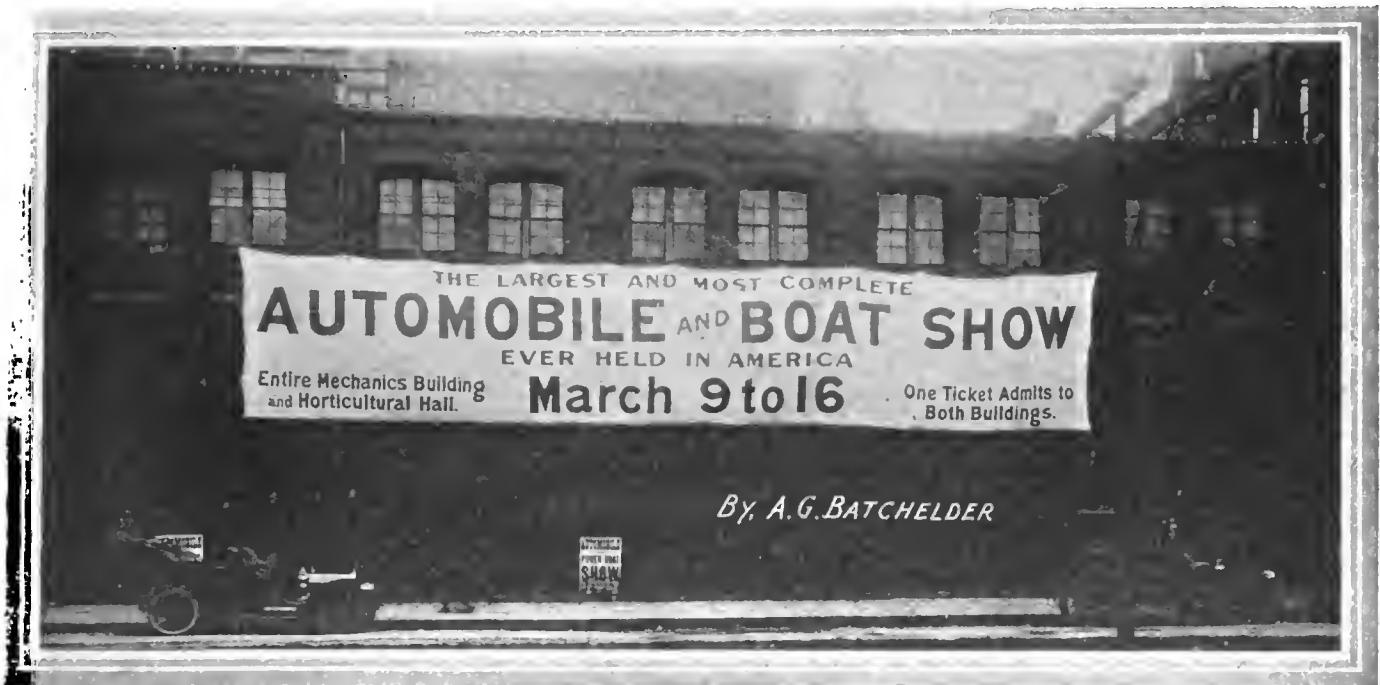
An Improved Breast Drill.—Quite a number of new and valuable features have been embodied in the improved universal breast drill, placed on the market by Patterson Brothers, 27 Park Row, New York. It has a chain feed attachment, operated by the supporting handle, allowing pipes and similar articles to be drilled with ease. It can be ad-



IMPROVED UNIVERSAL BREAST DRILL.

justed to any angle, making it indispensable for automobile working. The sweep of the handle can be adjusted, and when limited space does not allow a full turn of the handle the ratchet is used. It is provided with two speed gears.

THE AUTOMOBILE



BOSTON, March 13.—New Englanders are clannish. They prefer to buy and select their autos at their own show. This they have been generously doing since Saturday night last and will continue to do until Saturday night next. No such complete line of American automobiles—a few foreign makes are intermingled—has been placed on view at any previous show of the season. New York, through force of circumstances, had two shows on different dates, and while Chicago contained both the sheep and the goats—separate them according to your own ideas—its total fell short of the number housed in the elongated Mechanics' Building and the annex-serving Horticultural Hall, several blocks up Huntington avenue. The thrifty resident of the Old Bay State, the wooden-nutmegger from Connecticut, the clam-digger of "Little Rhody," the man from the Green Mountain State, he who hails from the Granite-ribbed commonwealth, and the "Down-Easter" from Maine are much in evidence, and from beginning to end the exhibition has the substantial hallmark of New England embedded in an unmistakable manner.

Underneath the Old Apple Tree.

"In the shade of the old apple tree" are the autos picturesquely displayed, and while there is none of the grandeur of the Garden show nor much of the admittedly harmonious dressing of the Coliseum, and thankfully an absence of the dark and dusty draperies of the Palace exhibition, the general effect is

pleasing and novel, suggestive of the coming of Spring and inviting to the owner and owner-to-be and typical of the truly American atmosphere of New England. Here one finds the conservative patriotism that blends reassuringly into the foundation of our great country, and the man whose blood has a Puritan tinge has been quick to appreciate and appropriate the motor-driven vehicle and the blessings that follow in its trail.

Before one reaches the orchard of the main hall he must needs pass through a gradually widening trellised garden; en route his pathway is bedecked with rambler roses, many of which contain cores of electricity; the autos are partially fenced in here and there; shining brass and nickel gleam and glossy enamel reflects so brightly that the fair sex cannot resist the mirror invitation to see if their hats are resting at the proper angle. Then one bursts into the grand showroom of the apple-blossomed decorations—and wishes, mayhap, that Manager Chester Campbell had bought just a few more apple trees.

Anent the Buying of the Apple Trees.

There was some difficulty, however, in the buying of these apple trees. Manager Campbell thought that he had an option on an orchard, but a farmer's wife who heeded not the mercenary spirit of her liege lord and master cancelled the deal at the eleventh hour. A snow-blown hunt for more apple trees became necessary, and it required some diplomacy on the part of those entrusted



LOOKING TOWARD MAIN ENTRANCE.

with the errand to convince the honest plowman that in selling frozen and rootless trees he was not guilty of obtaining money under false pretenses. At first he looked upon the buyers as if in doubt as to their sanity when they told of their plan to have the trees blossom before Spring. But the price was made, the trees sawed and brought to town, and lo! they are in full blossom for the show.

More Different Autos Than Ever Before Seen.

One hundred and twenty-one different makes of automobiles are scattered about the Boston show, and apparently not a single car of any importance is missing. Up in the galleries—sandwiched in with accessories galore—down in the basement with the motor boats, and up the avenue in Horticultural Hall are on view automobiles of all kinds—gasoline, electric and steam, from eight-cylinders down to one, with four and two-cycle engines, water-cooled and air-cooled, those which have gained the esteem of the buying public and those which are participating in

becoming more pronounced that there is some planning which may make the A. L. A. M. show a November or December event in Madison Square Garden, and the same line of conversation argues for December dates for the N. A. A. M. in Chicago's Coliseum. The A. M. C. M. A. and A. C. A. combination has an eye to the possible revised situation, and the representatives of the two organizations are hereabouts, ears to the ground and watchful of developments. While the Boston show is not national, national figures in the industry are numerous, and the talk of the hotels and clubs this week is automobile from early until late. Now and then the much-discussed Selden patent comes in for some attention, and the chances of a decision before next Winter's shows are weighed more carefully than would have been the case several months ago.

Revolutionizing the automobile industry is not quite as easy as it was a couple of years ago, and one hears less of these assertions as the motor-driven vehicle grows older. The New Englander has been something of an inventor in his day, but the



PAUL REVERE HALL, WHERE THE EXHIBITS OF THE VARIOUS POPE FACTORIES ARE SHOWN.

their débuts. It is an exhibition that tells of an industry's wonderful progress and its assured future.

A Dealers' Show Is Boston's Exhibition.

Successful and as big as it is, this New England exhibition is a dealers' show, for dealers and by dealers, for the purpose of educating the thousands who come in vast degree to learn about something in which they may never have an active part, except some day to be a passenger on an autobus. That opening night snowstorm of complimentaries, which is a Boston idea exclusively, brings to the show a good-natured mob, which peacefully edges its way into Mechanics' Building, congests the aisles, gets a fleeting glimpse of the cars, and emerges into the night, wondering where the money comes from which buys duplicates of those luxurious vehicles. Much good may result from this invasion of probable non-buyers; certainly no harm can result in their attendance.

Earlier Dates for Garden, Coliseum and Boston?

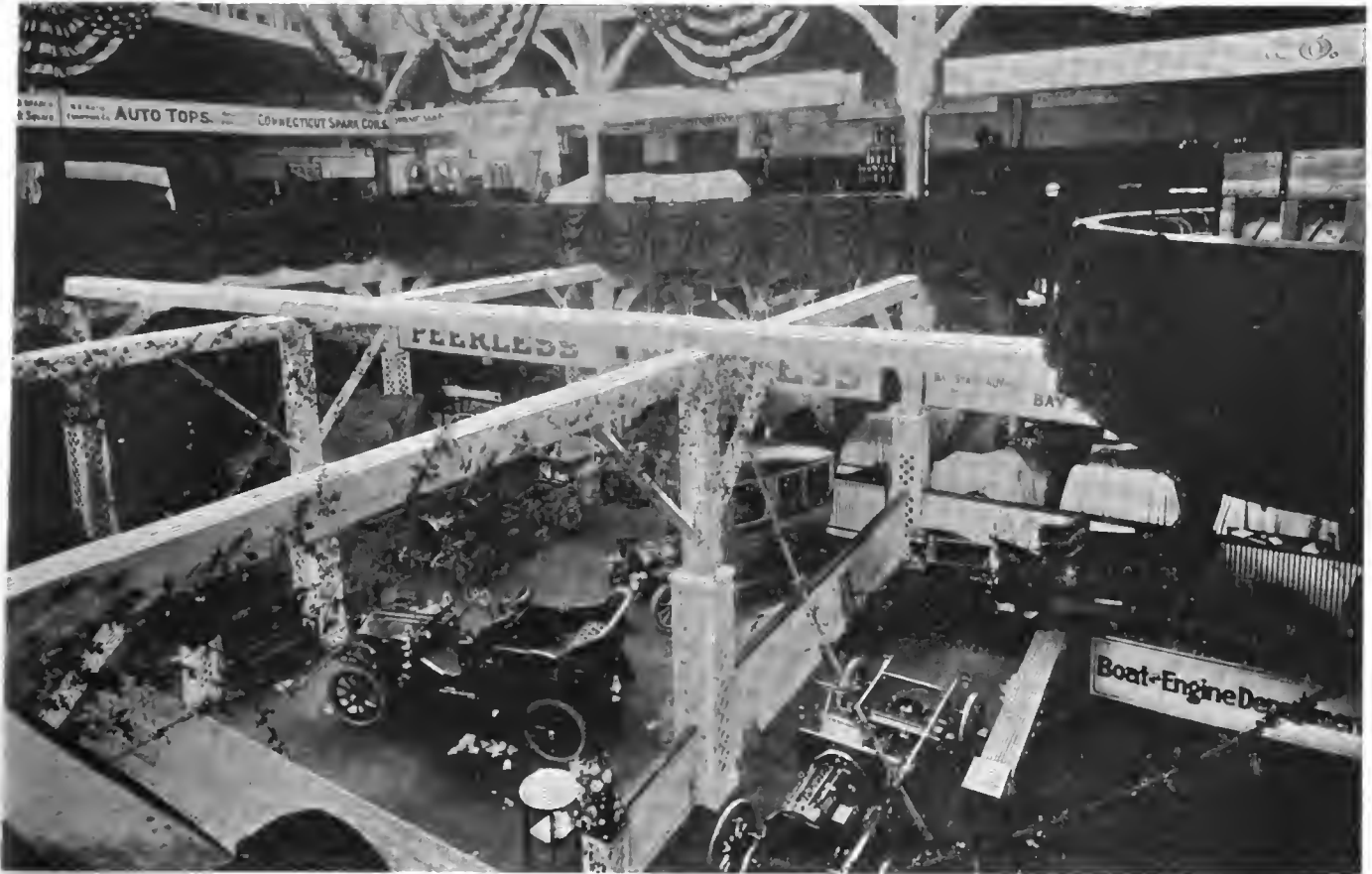
Of the big shows—and, though 'tis a dealers' affair, Boston is included—this one comes the latest, too late, say some of those most interested. But how to have it earlier, with Chicago holding forth in February, is an unanswerable problem. Talk is

automobile has been, and likely will continue to be, a product of gradual development, and so he has not brought forth anything that has disturbed the steady line of progress. While there are new cars in the Boston show, none of them will disturb the equanimity of the established maker. However, several newcomers should bid successfully for a permanent place in the industry. Accessories furnish a prolific field for inventive minds and not a few excellent new things are uncovered for the first time.

Boston's Auto Clubs Entertain the Trade Visitors.

At the clubhouses of the Bay State Automobile Association and the Massachusetts Automobile Club the visiting tradesmen are being made welcome, and it so happens that most of them are members of A. A. A. clubs in other cities. The national body has an excellent system of reciprocal club privileges, the understanding of which is a convenient asset during show time in the various cities.

The Wachussetts Automobile Club to-night held its annual dinner at the Parker House, President Chase presiding. First Vice-President L. R. Speare, Secretary F. H. Elliott, and Director A. G. Batchelder were A. A. A. guests of the occasion. The program of festivities was admirably arranged.



LOOKING DOWN FROM THE GALLERY IN THE EASTERN SECTION OF THE BIG MECHANICS' HALL BUILDING.



IN HORTICULTURAL HALL A 50-FOOT SEA-GOING MOTOR BOAT CONTRASTED PLEASANTLY THE DISPLAY OF COMMERCIAL CARS.



WHERE THE SLEEPING GIANTS REPOSED IN THE "APPLE ORCHARD," THE MAIN HALL HAVING BEEN TRANSFORMED INTO A BLOSSOMED BOWER FOR THE OCCASION.

SOME OF THE NEWCOMERS UNCOVERED AT THE HUB

FACTORY organization and the execution of plans for the building of a high-grade car are not matters that can be perfected at short notice, so that it is unusual to see a car that only made its debut a year ago, having all the earmarks of the product of a number of years' standing. This is the case of the Shawmut, which made a somewhat belated appearance at the Boston show last year, and is now being exhibited in all its glory. It is one of those rare instances in which a new car represents the work of its own builders from beginning to end, with the exception of such essentials as wheels and tires, that lie entirely in the domain of the specialist. What is even more unusual is the fact that, in this case, no attempt whatever has been made to rush a car on the market; the most painstaking effort has been taken to make every part of it as close an ap-

r. p. m. The carbureter is of special design, made in the home factory, while ignition is of the high-tension type, using a Simms-Bosch high-tension magneto as the source of current. Lubrication is entirely automatic and the fuel feed is of the pressure type, the gasoline tank having a capacity of 25 gallons, a tank gauge and hand pump being mounted on the dash. Control is by means of the usual hand spark and throttle levers on a stationary sector mounted over the steering wheel, beside which an accelerator pedal is provided.

One of the original features of the car is to be found in the clutch employed. This is of the multiple-disk type and is composed of 51 disks, but the latter, instead of having perfectly flat contact surfaces as is generally the case, are alternately of concave and convex surfaces. By removing 11 nuts, the entire



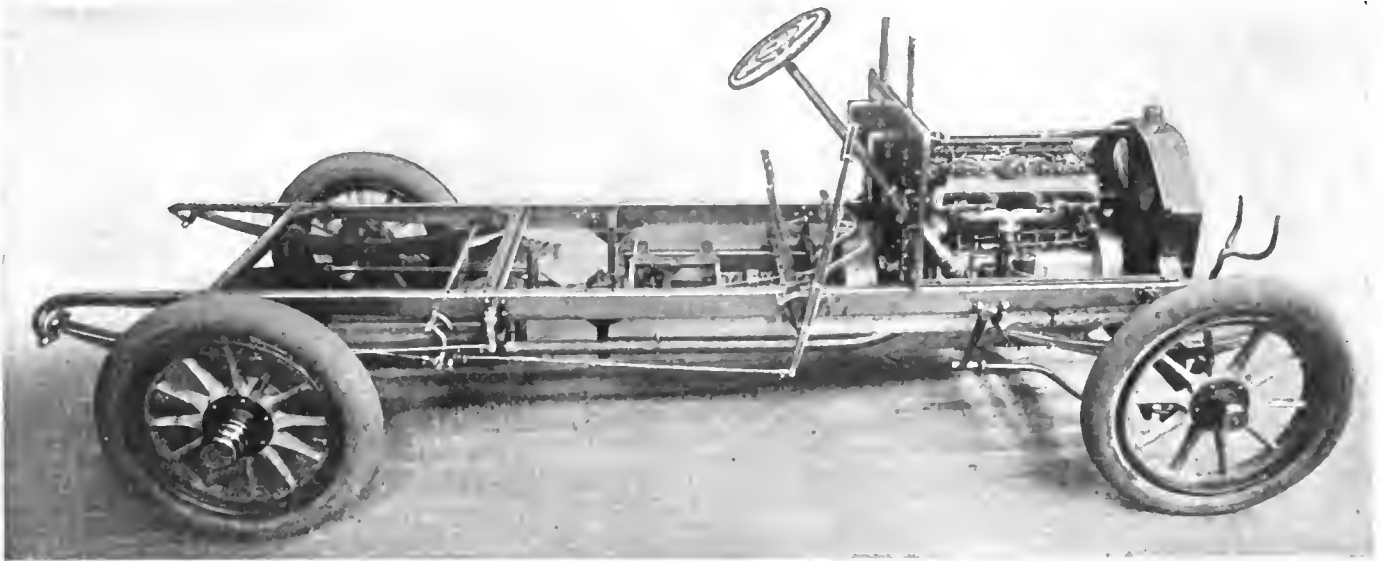
THE EXHIBIT OF THE SHAWMUT MOTOR COMPANY WAS COMPLETE, EACH TYPE BEING SHOWN.

proach to perfection of design as possible, and in the very highest grade of materials obtainable.

The statement of the makers that the Shawmut is *built*, not manufactured, serves to throw some light on the methods used in its construction, and is directly in line with the avowed purpose of the organizers of the company that is its sponsor, to build the best car possible irrespective of cost. No attempt has been made to produce a revolutionary design or a car that would in any way bid for public favor, through its bizarre or unusual features. The result is a car that embodies the very best ideas of engineering schools on both sides of the Atlantic, together with a number of ingenious original features. Four models are now turned out, the same chassis being employed as the groundwork of all of them. This is equipped with a 40-horsepower, four-cylinder motor mounted on a pressed steel frame of the usual channel section, and of the drop type. The motor cylinders are of the best grade of iron, cast independently, and their dimensions are 4.3-4-inch bore by 5.1-2-inch stroke, the engine developing its rated capacity of 40 horsepower at a normal speed of 1,200

clutch may be removed without disturbing either the flywheel or the transmission. A sliding-gear type of change-speed gear, operating on the selective plan of gear-changing, constitutes the next step in the transmission, the gears of which are all of Krupp steel, while the shafts run on Hess-Bright ball bearings of liberal proportions, as, in fact, is true of every other moving part of the car, including the crankshaft of the motor, no less than 47 bearings of this type being required in all. The change-speed gear provides four speeds forward and a reverse, the direct drive being on the third. The front axle is a one-piece drop forging of Krupp steel, and the rear axle is also of imported steel from the same makers. Suspension is of the standard type, using semi-elliptic springs front and rear, the former being 40 inches long and the latter 54 inches.

As an instance of the painstaking care used in the design and construction of every part of the car, it may be mentioned that multiple keyways of no less than six slots are used on all fastenings outside of the motor, and the manufacturers' confidence in their product is well demonstrated by the wording of their



THE CHASSIS OF THE BAY STATE FORTY SHOWS A STRONGLY BUILT AND A STURDY LOOKING CAR.

guarantee, which is to the effect that they will replace "without question as to cause," any breakage occurring within one year from date of purchase, when not due to collision or other external disaster.

A rather noticeable feature about Model A, known as the 40-horsepower roadster, is the fact that it is equipped with wheels of larger diameter on the rear than in front. These are 36 by 4 rear and 34 by 3 1-2 front, Michelin tires being the standard equipment, except where otherwise specified by the purchaser. The drop frame gives the car a pleasing appearance and keeps the center of gravity down, though permitting of 9 1-4 inches clearance. Two sets of brakes are provided, both centered on the rear axle, the foot or running brake operating an internal expanding brake on a special drum, and the hand brake, or emergency, operating a constricting band on the same drum. With full equipment, the roadster tips the scales at 2,675 pounds. The wheelbase is 108 inches and the tread standard. Seats for three are provided, the body being of aluminum and wood and of a special design built at the home factory which turns out all the bodies used on these cars. To protect the mechanism from beneath, a close-fitting sheet-steel pan extends from the radiator to the rear of the transmission case and is made so as to be easily removable.

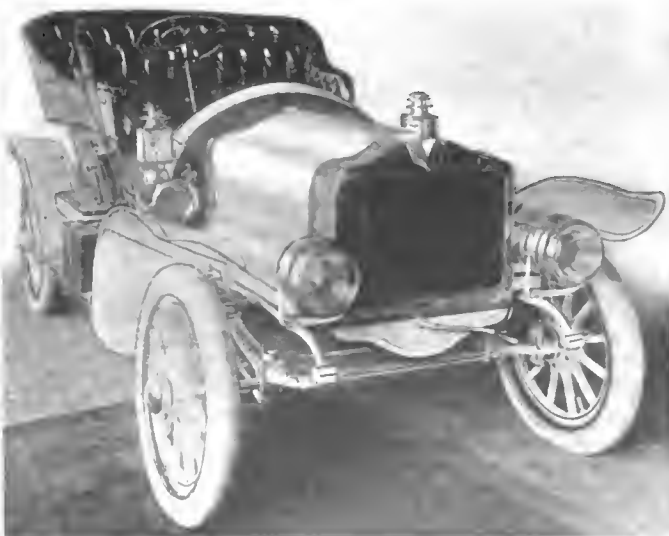
The touring car, known as Model B, differs from the roadster or runabout, chiefly in those points necessitated by the use of a longer body. For instance, it has a wheelbase of 112 inches

and is equipped with the same size wheels front and rear, larger tires being used on the latter; these are 34 by 4 and 34 by 4 1-2, the car in complete running order just reaching the 3,000 pound mark. The body is wood and aluminum, designed along the pleasing lines so strongly favored by Continental body makers—in other words, what is usually referred to as a straight line type. It is finished in ultramarine blue with black trimmings set off by light blue lines, the metal work and lamps all being nickel plated, the roadster being finished in white with black upholstery and also having nickel-plated trimmings. Model C is a 40-horsepower town limousine on a 108-inch wheelbase. It has a seating capacity of seven passengers and is finished the same as Model B, with the exception that the metal trimmings are silver-plated. The remaining model of the line, Model D, is a touring limousine with a seating capacity of eight passengers, and has a 126-inch wheelbase. Nothing that could conduce to the greater comfort of the passengers has been omitted, such as electric lighting, annunciators, mirrors, toilet facilities and the like. The stock finish of Model D is the same as Model C, but as the factory builds all its own bodies, the purchaser is given an option on any finish desired. The various models list at \$4,750, \$5,000, \$5,750 and \$6,500, in the order named.

The New "Bay State Forty."

As its name indicates, this is another home product of the New England soil. It has not been the object of the designers and builders to bring forth a new addition to the line of radical and out of the way cars, but rather to profit by the experience of those who have had to pay for costly mistakes of this kind in the past, and that is what they have done by taking advantage of the established trend of standard practise in every respect. The motor is of the four-cylinder type, the cylinders measuring 4 3-4 by 5 inches. They are cast in pairs and the motor is rated at 40-horsepower, which it develops at a moderate normal speed. The carbureter is of a special type with double throttle, and no less than three systems of ignition are installed. Two of these are entirely separate and independent, one taking current from a set of accumulators and the other from a magneto of the high-tension type working through a single coil and separate distributor. This latter system is duplicated by the use of a second distributor. For lubrication, a force-feed oiler of the mechanical type is employed, a sight-feed being placed on the dash. Control is by means of the usual spark and throttle lever on a stationary sector mounted over the wheel. The power plant entire is suspended on a three-point support employing a ball and socket joint as the third point.

To transmit the power, the first step consists of a multiple-disk type of clutch provided with cork inserts and having a ball-bearing end thrust. The change-speed gear is of the sliding



HOLMES TOURING CAR, WHICH IS BUILT IN EAST BOSTON.

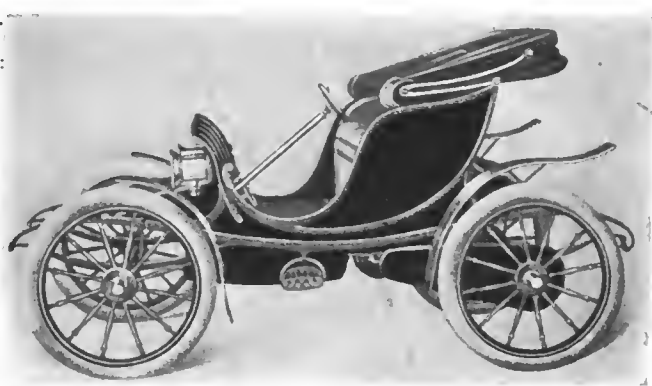
changing is effected by the straight or progressive method, the pinions being of special steel and designed with liberal faces and easy entrance to avoid clashing as much as possible. Final drive is by propeller shaft and bevel gear, a bevel differential being employed.

The foundation of the chassis consists of a pressed-steel frame of the standard channel section, suitably reinforced by cross braces and gussets with the usual I-beam drop-forged front axle; semi-elliptical springs are used front and rear. Two sets of brakes are provided, both of them centered on the rear hubs and of the standard internal expanding and external contracting type, operating by pedal and side lever respectively. The gasoline tank has a capacity of 18 gallons, beside which there is a reserve tank holding two gallons. With a touring body having a capacity of seven passengers, and full equipment, the car tips the scales at 2,800 pounds, which is unusually light for one of its power and size. The wheelbase is 122 inches and the tread standard, 34 by 4-inch front and 34 by 4 1-2-inch tires being fitted. The new car lists at \$3,750, with standard equipment of headlights, horn and tools.

An Electric Among the Newcomers.

Not the least prominent of the newcomers to be found at the show is the Bailey electric phaeton, made by S. R. Bailey & Co., Inc., of Amesbury, Mass. While new to the automobile field, this company has been known throughout the country for the past half century or more as builders of fine carriages, so that they are not altogether new to the making of pleasure vehicles. Few, if any, makers of electric vehicles build them entire, or to anything like the same proportion that is usually manufactured by the builder of gasoline cars, so that the carriage work is a correspondingly more important part of the make-up of an electric, and for this work, the new makers are, as already stated, exceptionally well equipped. In placing the Bailey electric victoria phaeton on the market, their object has been to produce a car for general city and suburban service, and one which, for both pleasure driving and utility, should meet the demands of the most exacting.

The sills of the frame are of patented construction and consist of a composite structure of steel angles and steel plate, which, while very rigid in one direction, possesses a certain amount of flexibility in others. It permits of the use of a very light and yet strong frame. The latter is hung upon four semi-elliptic springs, 40 inches in length. The motor has been specially designed for this service by the General Electric Company, and is wound to run at a potential of 60 volts. Both the motor and differential countershaft are hung in a flexible frame, preventing loss of alignment. From the motor to the differential countershaft, the drive is by means of a Morse silent chain, and from the countershaft to the rear wheels by roller chains, all of which are tightly enclosed in dustproof aluminum cases. The standard battery equipment consists of 30 9-N. P. Gould cells, but the purchaser may exercise his option in this respect and have any battery he prefers installed. The controller gives four



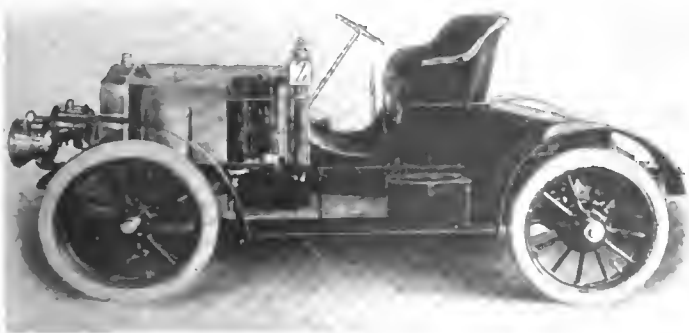
SIDE VIEW OF BAILEY ELECTRIC VICTORIA PHAETON.

speeds forward, the maximum being 18 miles an hour, the purchaser also being given the option of a higher speed if desired. Two reverse speeds are provided. Steering is by wheel of special Bailey pattern, the steering column passing through the dash at a point that clears the footboard enough to give plenty of foot and knee room; the steering column is arranged to swing aside to facilitate entrance and exit. The control lever is placed on top of the steering wheel and is interconnected with the brake, so that putting on the latter shuts off the power, and the latter cannot be applied with the brakes on. Three of the latter are provided, two band brakes on the rear wheels and one on the motor, giving a high factor of safety in this respect.

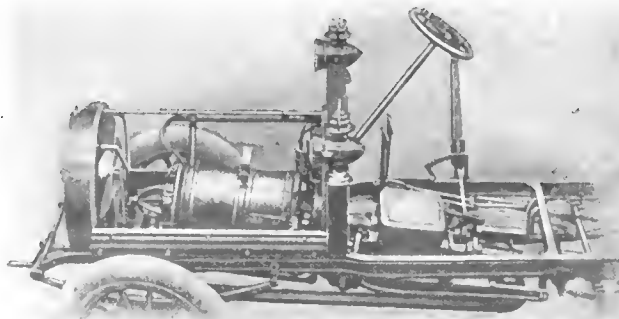
The running gear consists of Bailey oil-bearing, "pivot" axles, which have been a feature of their runabouts for the past ten years. The wheels are of an improved artillery pattern, 34 inches in diameter and carrying 3 1-2-inch pneumatic tires. The electric headlights and tail lamp are from special designs by Gray & Davis. With the standard battery equipment, the car is capable of running 40 to 50 miles on a single charge, and if desired by the purchaser, this may be increased 50 per cent. The car lists at \$2,000, a detachable rumble seat being provided at \$100 extra.

Two Types of the Holmes Shown.

Two different models of the Holmes cars are shown, one of them representing quite a departure from standard practise, in that it is equipped with a double-opposed horizontal motor placed parallel with the frame, but in front and under a bonnet. This construction is facilitated by the use of a friction drive bearing directly against the flywheel of the motor. The dimensions of the motor are 5 by 5 inches, developing 22 to 24 horsepower; ignition is of the high-tension type, using dry cells as the source of current, though provision is made for a magneto. The face of the flywheel of the engine is given a copper alloy surface and comes directly in contact with the fraction member of the driving gear mounted on a shaft lying parallel with the frame and not type, giving three speeds forward and reverse, the shafts being mounted on annular ball bearings of liberal dimensions; gear



THE LATEST ROSS RUNABOUT STEAMER LOOKS GOOD.



CHASSIS OF HEYMAN 5-CYLINDER CAR--A NEW COMER.



ATLAS AUTOMOBILE STREET SPRINKLER.

far from it. This friction member is arranged to slide along its shaft, control being by means of the usual side lever, all wear coming upon a special friction material which the makers of the car guarantee to be good for 5,000 miles and which can be replaced at a cost of \$3. The flywheel and friction member are brought together by means of a pedal-operated lever. Final drive is by means of a propeller shaft, fitted with two universal joints. The gasoline tank is placed under the front seat and holds 15 gallons. Tires are 30 by 4 inches. With the standard equipment, the car lists at \$1,350 as a five-passenger touring car, or at \$1,200 as a runabout.

The other car shown by the same builders is known as the Holmes Model H, and is a four-cylinder, 24-28-horsepower car of standard design. The motor cylinders are separately cast, their dimensions being 4 by 4 inches. The valves are oppositely disposed in chambers and mechanically operated, the ignition timer and pump being placed on the forward face of the crankcase and all timing gears thoroughly enclosed. The Holley carbureter is fitted, but if desired by the purchaser, an option on any other standard make will be given. The crankshaft is of high-carbon nickel steel, forged and cut from a billet. The crankcase is a special aluminum alloy, the supporting arms being made fast to the upper half which carries all the bearings, thus making the lower half serve merely as an oil pan. Ample inspection plates are provided and are held in place by thumb nuts so that no wrench is required for their removal. Ignition is of the high-tension type with dry cells, though provision is also made for a magneto on the engine. The transmission of this car is of the same friction type as that already described as being fitted on the Type S, except that it is differently arranged; the entire power plant carrying the flywheel friction disk is supported on a movable sub-frame under the bonnet, final drive being by means of double side chains. The clutch or friction engaging device is operated by means of a foot pedal, speed changing being accomplished by the usual side lever. As a five-passenger touring car fitted with 32 by 4-inch tires, the Type H Holmes lists at \$1,750, and as a two-passenger runabout, at \$1,500, the usual equipment of lamps, tools and the like being provided. While new in the automobile building field, the Holmes Vehicle Company, East Boston, Mass., are old builders of machinery, having had forty years' experience in this line.

The Heyman Car a Radical Departure.

This car may well be termed to represent the greatest mechanical novelty that the show brought forth. The power plant consists of a five-cylinder, four-cycle motor, the cylinders of which are placed round the circumference of a circle with their axes parallel to each other, the nest of five being surrounded by a single sheet-brass casing or waterjacket. The cylinders, which measure 4 1-2 by 5 inches, are ground internally and externally, all joints being conical and ground to fit, in order to obviate the

use of packing. The engine is a sort of straight-line type, the connecting rods all working on a single crank. The rods have hardened ball ends and work in hardened sockets; they travel in practically a straight line, as their maximum deflection is but 5-16 of an inch. The pistons are ground and fitted with four eccentric rings. Alternate cylinders are fired in sequence, five impulses taking place during every two revolutions of the crankshaft. The explosions are thus 140 degrees apart, lapping each other by 30 degrees, so that a constant turning effort is produced. Both the suction—mixture being supplied by a Schebler carbureter—and the exhaust of all five cylinders is handled by a single, conical, rotary valve, while an automatic oiler mounted directly on the engine takes care of the lubrication. The pump and ignition timer are also attached to the engine and are driven by hardened spiral gearing, ignition being of the high-tension type through a single coil. The engine is placed forward under the bonnet at an angle from the horizontal to bring it in practically the same plane as the driving shaft.

The change-speed gear is also of an unusual type, using roller clutches giving any desired ratio of speed between the engine and the rear wheels, so that with the lever in its minimum position the engine will run at 500 r. p. m. and only rotate the driving wheels once per minute, while in its normal position, 1 1-2 revolutions of the engine produce one turn of the rear wheels, any ratio between these two extremes being available. A sector giving 20 positions or speed changes is provided. Final drive is by cardan shaft with two universal joints of improved design. The frame is of the usual pressed-steel, channel-section construction, running on 34 by 4 1-2-inch wheels with a 108-inch wheelbase. Tread is standard and all on the car weighs 3,000 pounds, suspension being by means of semi-elliptic springs, 36 inches in front and 48 inches in the rear. The car is given a distinctive appearance by the use of a Whitlock radiator of round form. With the usual equipment, consisting of head and tail lights, tools, etc., the Heyman lists at \$4,000.

First Gasoline Sprinkler Shown.

One of the novelties that attracted a great deal of attention was the sprinkling wagon with its business-looking steel tank at the exhibit of the Knox Motor Truck Company's stand, in Horticultural Hall. This type of commercial vehicle is not exactly new, as it has had forerunners in the electric field, but it is the first of its kind to be driven by a gasoline engine, and further interest is added by the fact that this of the two-cylinder, two-cycle type specialized by these builders in their heavy trucks. The tank has a capacity of 800 gallons and can sprinkle a swath 24 to 28 feet wide, which, with its speed of 10 miles an hour, will give it the capacity of no less than four of the old-time horse sprinkled wagons; in other words, the one man in charge of this machine will be able to accomplish the same amount of work as four drivers and wagons and eight horses. The new automobile sprinkler has been ordered for use on the Revere Beach Reservation during the coming summer.

A New Tire Among the Accessories.

The only new thing to be uncovered in the field of tire making is the Butler tire, which is neither a pneumatic nor a solid, nor, on the other hand, a spring wheel, though in some respects it partakes of the characteristics of all three. Fastened to the felly of the wheel is a slotted rim of peculiar construction in that it provides accommodation at either side of the felly for two series of helical wire springs, which have members extending across the rim at certain intervals all the way round. The tire itself is a cross between a clincher and a detachable type of shoe and is made fast by means of a number of bolts passing through the felly. This holds it to the rim and it is supported above by the spring members referred to. The new Butler tire is being placed on the market by the Massachusetts Automobile Company, Church street, near Park Square, Boston, a concern that is one of the largest dealers in second-hand cars at the Hub, if not in New England.

THE BARKER-WHITE SYSTEM OF UTILIZING ALCOHOL

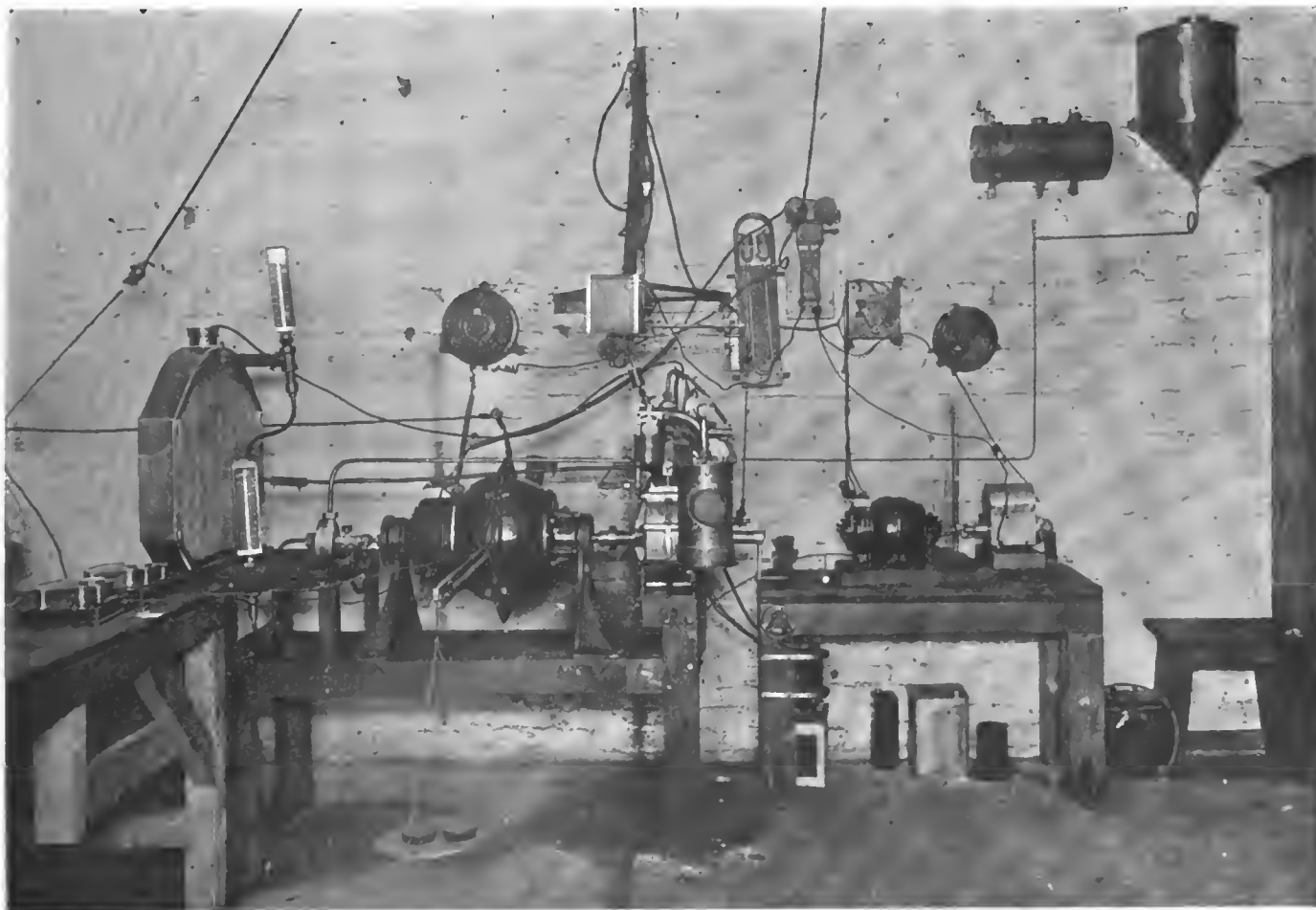
AS is probably well known to the majority of autoists, the use of alcohol as a fuel for the internal combustion motor is something that has occupied the attention of scientists and engine designers for quite a number of years past. Of course, this has been true only of the Continent, and no time has been devoted to the subject here prior to the passage of the recent legislation exempting denatured alcohol for industrial purposes from taxation, for the very natural reason that, even had it been greatly superior to other liquid fuels, it was not practical from an economic point of view owing to the tax. During the decade or more that has elapsed since the inauguration of the policy of Government support that has been so consistently adhered to in Germany, the alcohol motor has been made the subject of exhaustive experiment and investigation, and there are at present thousands of motors of various kinds used abroad with alcohol as a fuel. Those who are at all familiar with the subject are aware of the result; success with alcohol as a fuel has only been attained by the use of high compression, a long stroke and a slow speed—factors all of which contribute to the design of a motor whose weight per horsepower is unduly high, and in consequence unsuited to the needs of either automobile or light marine work in the motor boat.

Alcohol and Acetylene Compared.

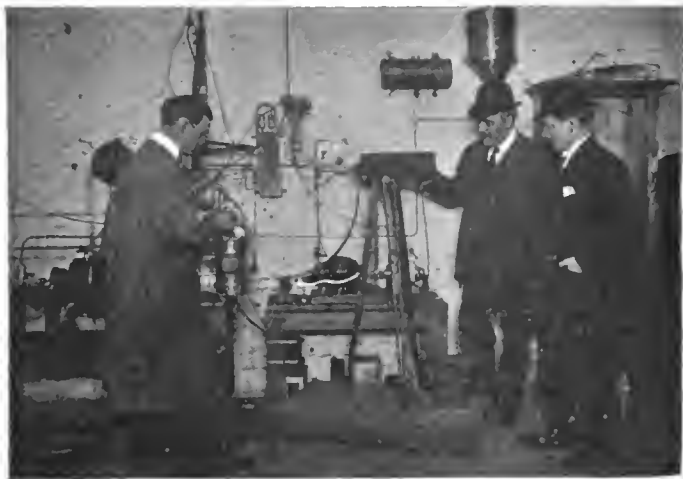
Alcohol is a definite compound, and its chemical composition is such as to preclude its burning sufficiently fast to permit of its use in a high-speed motor with any great degree of efficiency. By weight it consists of oxygen 34.8; hydrogen 13.0, and carbon

52.2; these figures are approximate and refer to pure alcohol which is commercially impractical. The ethyl or grain alcohol of commerce seldom contains less than 10 per cent. of water. This not only lessens its calorific value as compared with other fuels, but doubtless also tends to retard the rate of flame propagation, owing to the presence of the steam generated. An equally great objection to its use on the automobile is the length of time required as well as the necessity of heating in order to start, and the high temperature which must be maintained both in the vaporizer and the motor in order to realize anything like the maximum efficiency.

Acetylene, on the other hand, is a compound consisting of equal parts of carbon and hydrogen, and for that reason is found to be at quite the other extreme. In combination with 14 to 15 parts of air its explosion is so rapid and the pressures realized so great, that detonation more accurately describes its action. Although 12-2 volumes of air are required to burn it, and the most effective mixture is that already referred to, mixtures as weak as 18 to 1 will ignite readily, and in the experiments made by Grover even so lean a mixture as 30 to 1 showed an initial pressure in the cylinder of 180 pounds to the square inch, with a compression of but 30 pounds. Grover continued his investigations of acetylene as a fuel over several years and gives the characteristics of the explosion of a mixture of acetylene gas and air as follows: Great rapidity of flame transmission, a pressure of 120 pounds to the square inch being realized in .02 of a second from an explosion at atmospheric pressure; high combustion temperature and extraordinary amount of energy de-



ENGINE AND GENERATOR TESTING APPARATUS USED IN EXPERIMENTING WITH ALKOETHINE.



MESSERS. BARKER, WHITE AND TRACY DEMONSTRATING ALKOETHINE.

veloped, indicating that the thermal efficiency attainable with a motor using it as a fuel would be greatly in excess of any other known.

The Barker-White Combined System.

The foregoing data is given merely to show the status of these two substances as fuels for the internal combustion motor when the matter of investigating the possibility of using both in combination was first attempted by Thomas L. White, who has been granted a patent on a system of this kind, jointly with F. W. Barker (No. 839,798, Dec., 1906). Numerous experiments had been made with alcohol engines and a great many motors using this fuel had been in use over an extended period, their characteristics already having been referred to, and the possibility of using acetylene as a fuel had also been investigated at some length, though without any practical outcome so far as the actual building and commercial use of such a motor was concerned, when Mr. White conceived the idea of taking advantage of the extreme characteristics of both by combining them.

This he has done in what is known as the Barker-White system of utilizing a combination of these fuels, and though still in the experimental stage so far as the design of the apparatus to be ultimately employed is concerned, more than enough has been accomplished to demonstrate beyond a doubt what great promise a commercially practical method of effecting this holds forth. As is well known, the method of producing acetylene gas is by bringing water in contact with carbide of calcium, and this has been taken advantage of in connection with the fact that commercial alcohol always contains a certain percentage of water, thus affording a means of regulating the character of the mixture, as passing pure alcohol over the carbide would not affect it. Anhydrous alcohol is, of course, not an impossibility, but the process of distillation required to entirely free it of water is so long and expensive as to make it economically impracticable. However, the presence of water in the alcohol in the first instance is not a drawback, as it has been possible to greatly increase the quantity of water and still obtain excellent results. In fact, tests have shown that the greatest amount of power is obtainable from a mixture consisting of 19 per cent. water and only 81 per cent. alcohol, its density being ascertained with a hydrometer.

Description of the Testing Apparatus.

For experimental purposes a single-cylinder, 3 1-2-horsepower, water-cooled De Dion motor has been employed, direct connected to a multi-polar direct-current generator, the fields of which are supported on ball bearings, so that the drag on the latter may be measured. The power developed is dissipated through a resistance consisting of a bank of lamps placed in a closet so as not to interfere with the use of the manograph. The mixture of alcohol and water is fed by gravity to a carbureter of the regulation float feed type and the alcohol spray

produced by the latter is led to a comparatively large chamber placed close to the cylinder. In this chamber a small amount of calcium carbide is placed on a wire screen so as to be directly in the path of the incoming alcohol spray. The suction of the motor draws the latter through this carbureting chamber and the water contained in the alcohol generates a corresponding amount of acetylene gas. In order to prevent any dust from the carbide being drawn into the combustion chamber of the cylinder a screen is interposed in the intake pipe.

While a carbureter has been employed in these early experiments, it is anticipated that its use will be found superfluous; as equally good, if not better results, will doubtless be obtained by spraying the alcohol directly on the carbide, after the Deutz or similar systems. The same is true of the carbureting chamber itself, which has been made unnecessarily large owing to the crude state of development of the apparatus itself. Experience has shown that the consumption of carbide is very small, and it is thought that a method of feeding it, patterned along lines somewhat similar to that used in the shaking grate type of generator, will be found satisfactory; that is, employing two inclined perforated plates or screens between which the carbide will be held. These and other mechanical details, such as the best size of the chamber, method of spraying the alcohol and the like, are matters that have to be worked out.

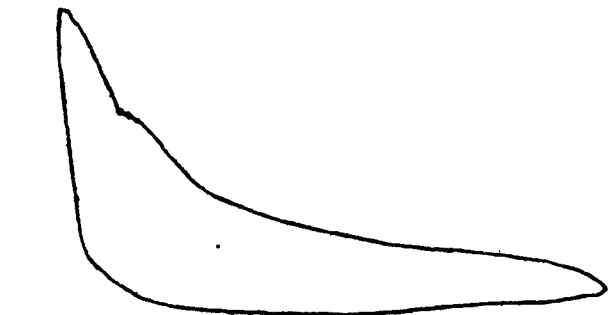
Theory of Alkoethine.

As has already been mentioned, alcohol burns very slowly, something like 1-20 of its total latent heat being required to burn it. This refers to absolute alcohol, and as the proportion of water increases, this factor grows correspondingly, which accounts for the fact that it has been found necessary to use a compression of 100 pounds or more with an r. p. m. rate of less than 500, together with a much longer stroke in order to build an efficient motor for use with alcohol as a fuel. This is taken advantage of by varying the proportion of water used, which in turn has a corresponding effect on the volume of acetylene generated. The resulting compound has been christened "alkoethine" by the inventors, and it is their theory that the mixture of air, alcohol vapor and acetylene gas is practically intermolecular, the heat generated by the conversion of the carbide into gas assisting materially in the vaporization of the alcohol. The theory of the action taking place in the cylin-



CARBURETING CHAMBER AND CONNECTIONS.

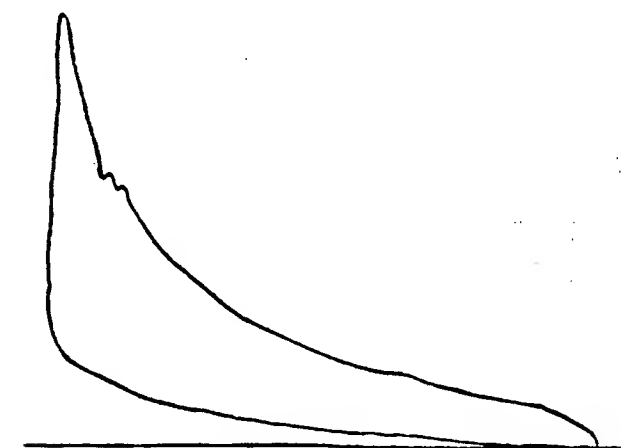
der when this fuel is employed is that the occurrence of the spark at the plug causes an instantaneous rise in pressure in the strata immediately surrounding it, and the molecules of acetylene gas throughout the mass are immediately detonated, serving to ignite the alcohol content without loss of time, so that the maximum thermic value of the fuel is obtained, com-



TRACING OF MANOGRAPH CARD; GASOLINE AT 1,300 R. P. M.

Combustion taking place at minimum volume or highest point of compression, as is shown by the fact there is less necessity of advancing the point of ignition in order to obtain the maximum power, than is the case with gasoline. Combustion is not in progressive strata, as is thought to be the case with the latter, but more in the nature of a true explosion. The carburetion process is entirely independent of the r. p. m. rate of the motor, as it is purely a chemical action, the mixture formed being much more homogeneous and thorough than could possibly be obtained by any mechanical means.

That a thermal efficiency, equivalent, or even superior, to that of gasoline is obtainable in a motor of the standard current design, may be seen from the fact that acetylene gas contains 21,492 B. T. U. per pound and gasoline vapor 21,900 B. T. U., while the thermal value of absolute alcohol is 28,500 B. T. U., the latter decreasing according to the extent of its hydration. But as this is practically disposed of when the alcohol spray comes in contact with the carbide, the latter robbing it of by far the greater part of the water, there is every reason to believe that the resulting mixture is a vapor having a value in B. T. U. somewhere between that of acetylene as above given and absolute alcohol, and consequently in excess of that of gasoline. The use of this mixture has also been found to overcome the



TRACING OF MANOGRAPH CARD; ALKOETHINE AT 1,400 R. P. M.

production of acetic acid, which invariably accompanies the use of alcohol alone, giving rise to corrosion of the cylinder walls and more or less pitting of the valves.

Some Experimental Results Obtained.

As yet investigations have not proceeded to any length, but experiments already carried out demonstrate that an efficiency

equal, if not superior, to that of gasoline is readily obtainable. No quantitative tests have as yet been made, but from the data obtained it is thought that the consumption of carbide will amount to about one pound per gallon of alcohol. Various proportions of alcohol and water have been tried, ranging from ten to twenty-five per cent., but at the latter point the explosions are of too violent a character, due to the large acetylene content of the mixture. A mixture containing seventeen to twenty per cent. of water has been found most advantageous, cards shown by the manograph when running on a nineteen per cent. mixture giving an initial pressure of 240 pounds to the square inch and producing almost ideal pressure and expansion lines, the compression of the motor being 65 pounds to the square inch. A large number of tests of this kind have been made and in the majority the range of mixtures referred to, i.e., alcohol containing seventeen to twenty per cent. of water, have been found to produce practically a characteristic gasoline card in the manograph, and, in some instances, a much straighter pressure line, indicating the greater rapidity of the combustion due to the presence of the acetylene gas. This is strikingly shown by the accompanying tracings of the manograph indication; in taking the latter no attempt was made at accuracy, as it is merely a pencil tracing from the ground glass of the instrument, and it is only reproduced here to give an idea of the character of the curve obtained. Both cards were taken from the same motor under similar conditions, one while using gasoline and the other with alkoethine, so that a comparison may readily be made, the latter card showing a much higher pressure line with an equally good expansion curve. It was also found possible to speed the motor to 2,100 r. p. m. under load, though its normal rate was 1,750.

That this system holds forth great promise commercially as a means of bringing alcohol on an economic plane with gasoline is quite evident. Present legislation on the subject, as altered by the recent amendments, makes it possible that denatured alcohol will be produced in the near future at a price very close to that at which gasoline is now marketed. Even in small quantities carbide now sells at three or four cents a pound and the cost of the latter is more than offset by the increase in the volume of the alcohol used by reason of the added percentage of water required.

AUTOS SUCCESSFUL IN POSTAL SERVICE.

WASHINGTON, D. C., March 11.—Representative Overstreet delivered a speech in the House of Representatives on the bill making appropriations for the postal service, in the course of which he called attention to the fact that for the last several months the Post-Office Department has been experimenting with reference to the rent of automobiles in the collection of mail and also in the distribution, which results in great expedition of the service. He stated that testimony was given before the Committee on the Post Office and Post Roads to the effect that while the charge for the individual automobile, including the driver, was considerable, yet the territory over which that vehicle could dispatch mail and from which it could collect it was so large that it covered from two to four collection districts where the mail was collected and distributed by the carrier with the aid of a horse and cart. He further explained that those individual mounted carriers who were displaced from the collection and delivery by horse and vehicle were then utilized in other parts of the territory and were not put out of the service. It was found, however, continued Mr. Overstreet, that great economy resulted from that change of practice.

"For example," he said, "I think in the city of Baltimore the experiment was very satisfactory, not only on account of the topography of the city, of the hills up which the wagons were obliged to be hauled, resulting in retarding the delivery of the mails, but, taking into consideration the number of mounted carriers to one district covered by an automobile, it resulted in a very material reduction of total expense."

MEN WILL AUTO FOR HEALTHFUL RECREATION

By CHARLES JEROME EDWARDS, TREASURER LONG ISLAND AUTOMOBILE CLUB.

THE future of the automobile industry will, I believe, be shaped, not so much by the man of wealth who inclines toward extravagance, but, instead, by the man of moderate income and modest pretensions, who will take up automobiling solely for its recreation and healthful features. In other words, the conditions of the future must be shaped somewhat by the demand of the enlarged clientele. My own belief is that we are at the parting of the ways; that we have reached the time where there will be two classes of cars—the very high-priced car, such as are represented by the foreign makers, for instance, and the medium-priced car, averaging, say, from \$1,500 to \$2,500. And to my mind the success of the automobile industry purely as a commercial proposition rests upon the ability of the manufacturers to provide for the general public this latter vehicle.

The good times and exceptional prosperity which all peoples have enjoyed during the last few years are surely to be followed by some one or two years of "hard times" at no very remote day, possibly three, possibly five years from now. This will hit the high-priced car very hard, and those of us who are enthusiastic and love automobiling, who may suffer thereby, will perforce have to be content with a less expensive creation.

The great field of the automobile in the future is to be among those who are new buyers, recruits to the army of amateurs who really have made the automobile industry. I think it will be agreed that, commercially speaking, the automobile has so far filled no great sphere, although of course a revolution will cer-

tainly be worked along those lines—but that, as I understand it, is not a subject under discussion. The future recruit to automobiling will very largely be the man whose income limits him to the low-priced car, and we find that sentiment extended all over the country. This is exemplified by the fact that the enormous number of second-hand cars which are disposed of each year go into country districts, and are in a sense an advance agent to reach the enthusiastic buyer of the future.

The era of good roads into which we are just entering will make every farmer of means, and the storekeeper and man of affairs in the various villages throughout the country, a convert to the use of the automobile, and his wants and opportunities are met by the low-priced car.

The recent show at the Garden was full evidence that the automobile manufacturers have in mind the production of this class of car—a moderately high-powered and reliable motor, which does not require an expert or non-expert chauffeur in order to handle it, but which can be understood and repaired by a man of average ingenuity and judgment.

This view of the situation is largely warranted by the fact that it was the single-cylinder machine which attracted buyers, and probably nine men out of ten who own high-priced cars began with the low-powered, inexpensive car. My theory is that the future will see nine men out of ten who become automobilists will do so because they can secure a good, reliable car at a comparatively small cost.

THE ENORMOUS DEMAND WILL CONTINUE.

By E. R. THOMAS,

PRESIDENT E. R. THOMAS MOTOR COMPANY, BUFFALO, AND E. R. THOMAS DETROIT COMPANY, DETROIT.

The enormous demand for automobiles experienced during the last year will continue throughout 1907. This demand enabled every manufacturer of a popular make of car to dispose of his entire output to dealers months ago. For the high class cars, the supply is entirely inadequate, and customers are already offering premiums to those who ordered early for their turn in delivery.

Our own condition right now is a truthful illustration of that with that of the leading manufacturers. We have orders on our books for cars amounting to \$5,500,000—over 1,500 automobiles—and with each one there is a deposit made to bind the contract. This is more than double the amount of business done last year.

As with every business, there are those who say every year that the demand is now at its height, and that it cannot last much longer. There is no truth in this, according to my lights. The demand that we have with us now will continue; the field is spreading all the time, and instead of the automobile industry being in danger of a slump within the next few years, it is my honest opinion that it is growing every day, and that the established manufacturers will be on an even solidier foundation and be doing a greater amount of business a decade from now.

WASHINGTON STATE IS BUYING MANY AUTOS.

SEATTLE, WASH., March 2.—Automobiles in great numbers for Seattle people have been tied up at various points along the roads westward, owing to the recent snow storms. They are now commencing to dribble through, and the agencies here are happy. Business here has been phenomenal thus far in the year. No less than 470 cars have been disposed of by Seattle agencies, a fairly good proportion of which are for various Puget Sound points. The aggregate value of the cars is \$600,000. This by no means represents the entire business to the Sound, as there are agencies in the different cities that are independent of the business here. The business in Tacoma is proportionate.

PRESENT LAWS SHOULD BE ABOLISHED.

By DAVE H. MORRIS,

EX-PRESIDENT AUTOMOBILE CLUB OF AMERICA.

A brief summing up of the present and future of the automobile, considered from its legal standpoint, makes legislation desirable that will result in the betterment of present conditions. The present law should be entirely abolished, and a new one substituted, of which the main provisions should be:

- (a) Driving to the common danger not allowed.
- (b) Elimination of all "miles per hour" prohibitions.
- (c) Penalties beginning with fines for first offenses, ending with suspended and revoked licenses, together with imprisonment.
- (d) Severe penalties for infraction of the law involving moral turpitude, such as receiving or demanding commissions, taking automobile without owner's consent, etc.
- (e) Annual license tax, the proceeds of which should be devoted to maintaining the new State roads.
- (f) Immediate review of any fine or penalty, by a superior act.

INDIANA FARMERS BUYING AUTOS.

FROM THE INDIANA FARMER, INDIANAPOLIS.

Editor "Indiana Farmer":

I am a reader of the "Farmer" and hear a great deal about the auto. I am a farmer and have ordered an auto; will have it by the first of March. Too many farmers always see the dark side of new improvements; some of them would howl if they were in heaven and St. Peter would give them a crown; they would ask for a better one. I think the auto has come to stay. I will admit there are some reckless auto drivers, but that is no reason you should condemn the machine. The law is in your favor; why don't you get after them? I know of several farmers in our neighborhood that expect to own autos in the near future. S. W.

This is as we predicted two or three years ago. Our well-to-do, ambitious farmers will own autos when the prices come down to hard pan; so it is well to be careful as to the laws we demand on the subject. Let them be just and reasonable; but farmers who are not able to buy, or do not care to own, autos have a right to demand that every precaution possible be made to protect their families from injury by them.

SOME PRACTICAL TYPES OF GARAGES

By GEORGE RICE.

ALTHOUGH the modern private garage is quite an expensive institution, I notice that a great many of them are being built. The custom of keeping the automobile in a shed, or an apartment of an isolated barn, or under some leaky roof of an outbuilding is fast being done away with. Automobiles cost too much, and too much depends upon the proper care of the same, to resort to poor building protection. Formerly the



FIG. 1.—Stable front altered for transformation into a garage.

automobile was purchased and then means sought to store and protect it. I have seen cases in which automobiles have been put out of service very early in the game, due to exposure in defective buildings. Sometimes the machine is exposed to dampness; and the rusting and corroding of the metal parts be-

gins almost immediately. I have seen the ignition system of high grade machines rendered non-effective after a week's exposure in a defective barn. Not infrequently no protection at all is obtainable, and the purchaser of the machine simply covers the same with a canvas. Then I have seen cases in which machines have been run into livery stables for temporary storage for want of better service. In fact, all kinds of ways have been utilized by machine owners for the care of their automobiles when not in use, some of which have proven to be quite disastrous to the car.

In this article we will refer to some of the modern types of edifices which are being designed for automobiles. It is by far the better way to first secure the storage. But, as before intimated, it is the custom for most enthusiasts to get the machine first and take chances on the rest. Perhaps the buyer owns a carriage shed or a stable, and he can put his newly purchased automobile in the same. But he finds that there are many facilities lacking.

The care of the modern automobile calls for equipments that are not needed in the care of common vehicles. Hence to utilize a building intended for other purposes is not always advantageous. Nevertheless, I have seen a number of stables altered over so as to make first-class garages, one of which is exhibited in Fig. 1. Much depends upon the character of the building. If there is an abundance of horse stall space, you can use these for other purposes and the stalls can come out. The harness room makes a first-class apartment in which to keep extra tires and various parts of the automobile, such as the extras of the mechanism, robes, rubber covers, etc. The first work involves the overhauling of the entire interior. You knock down your stalls and partitions which are liable to interfere with the arrangement of the automobile.

The two plans, Figs. 1 and 2, will demonstrate the arrangement. In this case, the windows and doors of the building were removed and the plain lights changed for the artistic description of sash with colored lights. This was done in the doors as

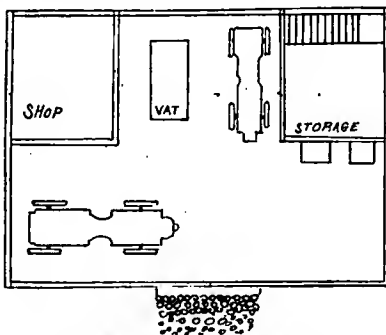


FIG. 2.—Floor plan arrangement for the autos and their appurtenances.

well as in the window sash. The exterior was painted an appropriate color, and quite a neat effect resulted.

The floor plan shows the arrangement of the automobiles. In order to give a place where the chauffeur can get below the machine and attend to any requirements there, a vat is made in the floor and the machine is run over this pit when an examination is necessary. The mechanic can get in the pit below with the electrical flash light or a common lantern and readily see the lower portion of the car. The floor is cemented. It is slightly elevated in which the machine is washed with a hose and nozzle, and the edges are grooved so as to carry off the water. There is a workshop over in one corner of the place, and no garage should be without one. There should be a vise, a work bench, taps and thread-cutting dies, drills, wrenches and the usual supply of tools and devices for doing work on the cars when necessary. It is a good plan to carry a small assortment of bolts, nuts, set screws, washers, lag screws, etc. You will, of course, have your kit of tire lacing devices.



FIG. 3.—Front of brick and stone garage.

The stairs at the rear of the store room lead to the rooms of the chauffeur above. Here you put in some furniture and make your man comfortable, and he will be more likely to look out for the machine well. He ought to have his bath, toilet, and other modern conveniences. As a rule the chauffeur will do most of the work about the machine and keep his apartments in order. I notice that some of the rich people have a helper for the chauffeur. He is usually a lad at low wages. Some people who run one or more machines go even further and have a mechanical man. But this is going rather deep into the game. A good chauffeur can attend to most of it. He may have to discard his brass-buttoned suit and get into overalls occasionally to wash the car, but this will not hurt him any. Of course, some people prefer brick or stone buildings for keeping their automobiles. Fig. 3 is a type of brick and stone building which impressed the writer. Buildings of this nature are preferable for districts in which a fireproof structure is needed. The middle door is for the entrance of the machines, and there is room enough on either side of the interior for a large car. The building is deep enough to warrant partitioning off for shop, extra part room, etc. There are the upper rooms for the chauffeur and general purposes.

A building of lighter construction, and cheap, is shown in Fig. 4. It is not desirable to have a building too much like a barn. Still, the plain edifice answers all purposes. Of the buildings referred, the values of each vary considerably. The brick building is, of course, the most costly. It would cost nearly \$3,000 to get a structure made of this nature, while an investment of \$400 will give you a building like that in Fig. 4. For about \$1,000 you can put up a first rate building of the

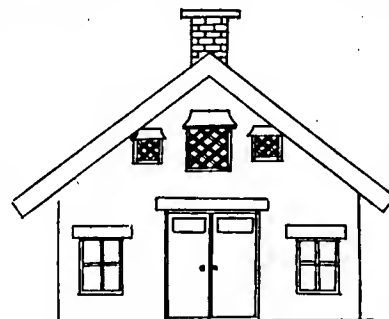


FIG. 4.—Small garage costing about \$400.

plan presented in Figs. 1 and 2. The best way is to get builders to figure on the structure. You can present sketches of what you desire and specify the details if desired. The contractors will do the rest, and save a lot of trouble for you.

Regardless of this, I know of a number of noted automobilists who have planned and erected the garage themselves. They made the drawings, selected the land, engaged the masons to put in the foundation, purchased the lumber and furnishings and watched every detail of the erection of the building from the basement up. Some men delight in doing this. But the average automobile enthusiast finds it better to turn the whole thing over to the experienced contractor, and let him do the planning and the thinking, at so much for the building complete.

AUTOS BECOMING NUMEROUS IN EGYPT.

U. S. Consul-General L. M. Iddings, of Cairo, transmits the following report on automobiles in Egypt:

The number of automobiles in Egypt this winter has greatly increased over those of last year. Machines registered in Cairo now number 264; last season, 75; in Alexandria, 127, as compared with 120 last season. In Cairo one or two new garages have been built. Most of the cars owned by residents are French,

but the tourists have brought in all kinds. The opinion of everybody is in favor of cheap cars, which have a closed-in top and are of small horsepower. There are no hills to climb. Roads for police service in the Eastern Desert are in construction by the mining department of the ministry of finance.

The road from Edfou to Beza has been completed, and consists of an excellent track 90 miles long. From Beza it will branch to the south and north. The southern line will go through the emerald fields, while the northern branch will join the Keneh-Cosseir road from the Nile Valley to the Red Sea. Keneh is another base for a road northward. This road is now building along the old Roman way, which was constructed in order to bring the property from the Red Sea coast to the Nile, where it was floated down the river to be sent to Rome. This road, as at present planned, is to end at Ghattar, which is 90 miles from Keneh, and is half-way to Gebel Zeit.

The Edfou-Beza road has been largely used for motoring, and the new type of motors, which have been built for the use of the department of mines, has been found satisfactory. Motors are a far less costly and difficult means of conveyance than camels. The longest day's run in the Eastern Desert was made last mid-summer, when 148 miles were traversed. During the last trip of the mining department's tricar 243 miles were accomplished.



FRENCH RENARD SIX-WHEEL AUTO TRAIN DEMONSTRATING ON ALDERSHOT PLAIN BEFORE BRITISH ARMY OFFICERS.

WAR OFFICERS INTERESTED IN AUTO TRAIN

LONDON, March 2.—The British War Office is at present paying much attention to the improvement of its transport service and experimenting with various kinds of tractors for cross-country work. Particular attention has recently been paid to the Renard train, the invention of the late Colonel Renard, a noted French engineer. The idea is not by any means new, for Renard died near Paris nearly two years ago, and at that time his train was a familiar sight on the highways in the neighborhood of the French capital. It is the first time, however, that it has been seen in this country, and its appearance has caused considerable interest among army officials and public transport companies. Briefly, the train consists of a tractor and a series of six-wheel coaches, each one of which has a pair of driving wheels and two pairs of steering wheels. In France various tractors were used for drawing the train, among them being a Serpollet steamer, a Darracq engine and a Panhard. For the British experiments a 75-horsepower Filtz four-cylinder gasoline automobile was employed. Power is transmitted from the motor at the head of the train to a countershaft on the car immediately behind it, the drive being through side chains to the center pair of wheels. The propeller shaft is extended to the rear of the car and connected by means of a universal joint to the shaft of the following car, continued thus throughout the

entire length of the train. For steering the front and rear wheels, turn at equal angles but in opposite directions, and in precisely the same degree as the wheels of the motor car and other trailers ahead. In the trials the train was made to make some very erratic turns, and in every case was entirely satisfactory, the rear wheels of the last wagon traveling to within an inch or two in the same track as the motor. With a train of four long coaches, altogether 73 feet in length, a circle of 29 feet diameter was described. Afterwards the same performance was gone through in a reverse direction, a man simply guiding the rear wheels of the last coach. Further experiments were made at Aldershot before a number of English military experts, the train being especially tested in its ability to accomplish cross-country runs. These tests showed that the train would be of considerable value in carrying ammunition and stores to the fighting line. Sixteen Renard trains are now in use in different parts of the world; their manufacture will shortly be undertaken in England by the Daimler Motor Company, Ltd. It is expected that they will prove of considerable service as feeders for existing railroad lines, carrying market produce and passengers from outlying districts to centers of distribution. The somewhat arbitrary auto laws of this country offer no objections to the circulation of these trains.



CUTTING WOOD INTO BLOCKS FOR SPOKES.



ROUGH SHAPING THE BLOCKS TO BECOME SPOKES.

MAKING WHEELS FOR AUTOS.

There is nothing of a complicated nature in an automobile road wheel; it has a metal hub in which are assembled wooden spokes, maintained at their extremity by a wooden band, encircled by a metal rim with special flanges for holding the pneumatic tire in position. Simple as is the product, the construction of an automobile wheel is a matter requiring highly skilled labor, the finest materials, special machinery, and the co-operation of a number of specialists. The illustrations on this and the following page show the upgrowth of an automobile wheel from the time the wood enters the factory to the moment when it leaves the works to be operated on by the painter and the tire expert. Whether it be the slender wheel of the ubiquitous runabout, a ponderous truck wheel with its iron band, or the touring car wheel, to be equipped with costly pneumatics, the process of construction is practically the same.

Suitable blocks of well seasoned wood are cut up to the length of the spokes by means of a band saw. Each block of wood has its end shaped by a special machine, forming a miter and tenon to suit the style of hub in which they will later be assembled. A moulding machine next plays an important part in the growth of the wheel. One by one the blocks are placed in the machine, the workman operates his lever, the circular plane comes into operation, and a few seconds later the block has assumed the familiar shape of a spoke. Up to this point there has been very little hand labor, yet it is necessary for the workman to have a vigilant eye and throw out any spoke which shows the least defect.

Passing to another workshop the finished spokes are assembled in a metal hub. The style of hub and methods of assembling differ considerably in the various factories. In the illustration herewith, which shows a heavy wheel intended for an omnibus, the spokes have been driven home by means of a mallet. The felloe has now to be fixed in position, and for this operation the spokes and hub are moved on to another workshop where a specialist takes them in hand. The felloe consists of two half circles previously bent into shape by a steam process. When the two halves have been placed over the ends of the spokes, secured and adjusted, the wheel is formed. As, however, it is impossible to allow the bare wooden rim to come in contact with the road, it is passed on to another department, where an iron band is made to encircle the wooden rim, giving additional strength, providing a running surface if the wheel is of the solid tire type, and an appliance for holding the pneumatic in position if it is of the rubber shod variety. This last operation is not the simplest of the many processes through which the wheel passes before it is fit to carry a flyer at a fifty-mile clip. The workmen engaged in this operation must be trained to work together, and must give full attention to the old adage "strike while the iron is hot." The metal rim is brought to a red heat in a special furnace, seized by three workmen armed with long gripping tools, and rapidly placed over the wooden wheel and driven into position with a few vigorous blows. For this operation the wheel has been placed in a kind of cast iron vat, plainly shown in the illustration. Immediately the rim is placed a few buckets of water are thrown over the wheel, the metal band contracts as it cools, binding all more tightly together.



FINISHED SPOKE LEAVING AN AMERICAN MACHINE.



ASSEMBLING THE SPOKES IN THE HUB.



PLACING WOOD RIM IN POSITION ON SPOKES.

The method of manufacture just described in that employed in one of the largest French wheel factories, the firm of Vinet & Boulogne, at Neuilly near Paris. The photographs were also taken in these works. This factory is one which first produced the dismantable rims which made such a revolution in last year's auto racing. Some of the rims will be noted in the engravings. In connection with wheel construction it is interesting to note that a large number of American machine tools are employed. The sturdy sabot-shod Frenchman shown operating at the foot of the preceding page has a lathe from the Defiance Machine Works, Defiance, O. In all the larger French wheel factories American tools are extensively employed, the products of such firms as Buckeye Wheel Company, Galion, O., House's Cold Tire Setter Company, St. Louis, being as familiar as the national article.

Such, in general language, and with an avoidance of technicalities, is the process by which an automobile wheel is built up. There naturally remain a number of finishing processes, but the wheel is practically complete as a wheel when the metal rim has been fixed. When it is remembered to what strains the wheels of an automobile are subjected from rough roads, lateral blows, skidding, and hard knocks against foot paths and banks, the necessity of the best of material and the most skilled workmanship will be apparent to all.

The proposal to erect a monument to the late Léon Serpollet on one of the public squares of Paris has met with hearty support in French automobile circles. Although only opened a few days ago, the subscription list has already reached the sum of 21,312 francs 20c.—about \$4,262.



DRIVING METAL RIM ON OMNIBUS WHEEL.

TWELVE HUNDRED DARRACQ CABS READY.

PARIS, March 4.—The first of the big series of motor cabs which several French manufacturers are constructing is now approaching completion at the new Darracq factory, near Paris. The Darracq machines, 1,200 in number, will be placed on the streets of different world's capitals, 500 going to London, 300 to Paris, 150 to Berlin, 100 to Vienna and 100 to Bombay. Two models are being constructed, one a two-cylinder 12-horsepower, the other a four-cylinder 18-horsepower. Characteristics are pressed steel frame narrowed in front, cylinders cast in pairs, 90 by 120 bore and stroke, mechanical valves, high-tension magneto, spray carburetor with automatic air inlet, high-tension magneto, tank and radiator combined, with high speed fan and thermo-syphon water circulation. There are three speeds forward and reverse operated by one lever under steering wheel, leather-faced cone clutch, internal expanding brakes, equal wheels 810 by 90, shaft drive, pan under frame. The weight of the two-cylinder model is about 2,090 pounds. The four-cylinder model may have either thermo-syphon or pump circulation, will have larger wheels, a longer wheelbase, and will weigh about 2,200 pounds. All the Darracq cab models will be fitted with landaulet bodies built by Vedrine, of Paris, and will be shipped complete. The new factory only began work at the end of last year, but the first complete series is expected to be delivered by the end of May. The total output of automobile cabs from the Darracq factory alone will be 2,500 per annum. When it is remembered that other firms, among them Bayard-Clément, Renault, C. G. V., and Unic are prepared to do business on an almost equally gigantic scale, it is not an exaggeration to predict the abolition of the cab horse at an early date. The sudden growth of this branch of automobiling has taken French body builders by surprise, few of them being able to turn out their product to keep pace with the chassis. A temporary delay is likely to be experienced on this account. Some of the best French body makers, foremost among them being Vedrine, have realized the immense importance of this trade and have commenced the erection of large factories for the construction of automobile cab bodies in series. So far as can be gathered, no definite arrangements have yet been made for the placing of French automobile taximeter cabs in New York.

FRANCE HAS THREE UTILITY CONTESTS.

PARIS, March 4.—The Automobile Club of France has approved the scheme of the Marquis de Dion to organize a touring and speed contest this summer. The event will consist of a 1,000-mile touring competition for machines weighing 3,630 pounds, with four passengers on board, but without tires, spare parts, tools or gasoline. An average speed of 24.8 miles an hour must be maintained throughout the tour, with a gasoline allowance of either 3.9 or 4.4 gallons per 62.1 miles. It has not yet been decided which fuel allowance will be adopted; the committee are in favor of the larger, but several competitors think that the smaller allowance would be ample. Machines qualifying in the thousand-mile tour must compete in a 248-mile speed test over a fast course near Trouville. The tour, to be known as the Criterium de France, will be held from August 2 to 6; the race, entitled the Press Cup, will probably be held on August 7. Teams of three may be entered by any firm at a cost of \$500 per car up to May 1. After this date and up to July 1 the fee will be increased 50 per cent. for every period of six days.

The date of the French industrial vehicle competition and small touring car test has been fixed from May 20 to June 10, thus occupying 20 days. Five types of industrial vehicles are provided for, from light delivery vehicles carrying not more than half a ton, to heavy wagons taking a load of 1 ton. The small touring-car competition is intended to provide for doctors' automobiles. All machines must be run on alcohol of 50 per cent. grade. They must carry two passengers, travel at an average speed of not less than 9 nor more than 18 miles an hour, and have total weight proportionate to cylinder area.

LETTERS INTERESTING AND INSTRUCTIVE

Important Laws in Pneumatics and Hydraulics.

Editor THE AUTOMOBILE:

[630.]—Being a reader of your paper, I wish you would answer my questions in the columns of your next issue: (1) State three important laws of pneumatics and explain an application of each to automobile engineering. (2) State three important laws of hydraulics and explain an application of each to automobile engineering. (3) In what way do cam mechanisms permit of results otherwise unattainable by mechanical means?

Erle, Pa.

CHARLES SCHOLZ.

If it will be of any real help to you, we are glad to answer your questions, though we note that these questions are those used in the courses of a well-known correspondence school, of which we assume you are a student, for which reason we are not altogether able to see why you should ask us instead of the school for the desired information. Three important laws of pneumatics are involved in the heating of gases by compression, in the cooling of gases by expansion, and in the expanding of gases by heating. In automobile engines, when the charges are compressed, they are heated thereby, and when they expand from the heating effect of their combustion they cool, while at the same time developing the power. An important law of hydraulics is involved in the fact that liquids are practically incompressible, another is involved in the fact that connected bodies of liquids have surfaces normally standing at the same level, and a third is the law of capillary attraction. In any forced-feed lubricating system a given movement of the pump plunger positively injects a corresponding amount of lubricant to the bearing, which is an application of the first law. The second law finds an illustration in any float-feed carbureter, in which the height of the fuel within the atomizing nozzle bears a fixed relation to the height of that within the float chamber. The third law also is illustrated by the float-feed carbureter, in that it causes the fuel in the atomizing nozzle to stand rather higher than it would if governed solely by the second of the laws enumerated. The way in which cam mechanisms permit results otherwise unobtainable by mechanical means is that they afford a variety of possible forms of movement which is practically infinite, which is not to be said of any other single device.

A Peculiar Trouble.

Editor THE AUTOMOBILE:

[631].—I have read with interest the letter in one of your recent issues from Jas. J. Thomas, Jr., since I have experienced something like the same trouble with the lubrication of my six-cylinder Ford car. The evidence of the trouble is that, with proper adjustment of the oil feed, the spark plugs of the first three cylinders must be cleaned very often, the fourth less, the fifth still less, and the sixth practically never. The spark plugs of the last cylinder are always dry and clean, in fact, but I have never had any trouble with overheating, scoring of cylinders, or seizing of pistons. I am sure that the oil is of the proper quality. There are no hills in this section of the country, the roads being perfectly level. The level of the oil in the crankcase was determined after careful experimenting with it at different levels. Any information you can give me will be greatly appreciated.

Norfolk, Va.

WM. S. ROYSTER.

It seems to us that the best way of securing satisfactory advice in a difficulty like the foregoing is to communicate directly with the manufacturer of the car. Are you sure, for instance, that you are using an oil approved by the Ford people? Of course, it seems rather singular that the fouling of plugs should progressively increase from the rear to the front cylinders, though this in itself is hardly a serious matter, inasmuch as any spark plugs are fairly certain to become fouled occasionally, under certain conditions. Possibly the manner in which lubrication is effected has something to do with the difference. Usually fouled plugs may be taken as an indication of over-lubrication, though adjusting the oiling should correct this if it exists.

V. L.

Electric Lamps for Automobile Lighting.

Editor THE AUTOMOBILE:

[632.]—There are a number of things I would like to know about electric lights for automobiles, and I trust you can furnish me with the desired information. First, it appears to me that the storage battery is the most satisfactory source of current, since a dynamo is difficult to regulate, and, besides, cannot furnish power when the engine is not running. Second, in view of these conditions, it is desirable that the greatest light with the lowest current consumption be secured, making it an object to utilize something more efficient than the ordinary incandescent lamp. And, third, if the objects stated could be realized, electric lighting would be much more satisfactory and efficient than the acetylene systems now in vogue. What is the reason that the Nernst lamp, or the new tantalum, tungsten, and osmium lamps cannot be used, with the result of securing much better efficiency of illumination than so far has been found possible?

Topeka, Kan.

CHESTER K. SCOTT.

It is altogether possible that the future may bring some improvement along the lines you suggest, but at the present time there is little to indicate that success awaits their first trial. The Nernst lamp, in its present most successful forms, requires current at a voltage too high to be supplied without more storage cells than would be regarded as convenient on the ordinary gasoline car. And the filament of the Nernst lamp is of a mechanical strength scarcely sufficient to withstand the jolting to which it would be subjected on a car. The other new lamps you mention—those of the incandescent type, with filaments of certain of the rare metals—are scarcely tested to the point of thorough success, even in general applications to commercial lighting, so their possible value in automobile service is altogether an unknown quantity. The tantalum lamps, especially, probably suffer injury from jarring.

The Combustion of Compressed Mixtures.

Editor THE AUTOMOBILE:

[633.]—Can you refer me to some book or article on the subject of automobile engineering from which I can secure data concerning the action of mixtures fired under pressure? What I particularly desire to learn is the rate of flame propagation and the amount of pressure rise in different mixtures ignited at different pressures.

Portland, Ore.

ALFRED ROGERS.

What we must confess as an absolute inability to give a satisfactory answer to your questions constitutes one of the many startling evidences that exist to prove the developing status of gas engineering. So far as we know, if any tests of the sort you specify ever have been made, the data secured from them has not been made public. A number of years ago, Dugald Clerk, the well-known English engineer, made some rather elaborate tests with gas mixtures at atmospheric pressure, while at the Massachusetts Institute of Technology some similar tests were made. From the meager facts thus made available all of the stock theories of desirable mixture proportions are derived, despite the fact that very little is known concerning the action of mixtures under pressure. If any one who reads this can give more information on this interesting subject, the columns of THE AUTOMOBILE are open to it.

More About Fording Deep Streams.

Editor THE AUTOMOBILE:

[634.]—Taking up question No. 606, would like to ask why he could not ford streams if he should have intake pipes made to his carburetor so they would rise above or even with the commutator.

Providence, R. I.

W. W. GRANT.

Merely raising the intake piping above the water-level would not prevent water entering the carburetor and putting it out of commission, but the carburetor entire might be placed above the cylinders instead of down at the side as is ordinarily the case. However, the answer to the question

was based on the assumption that no changes of any kind were to be made in the car, as the query was not what could be done to the car to make fording deep streams possible, but rather how to ford them when the carbureter is under water. Placing the carbureter where it would not be submerged would, of course, constitute a remedy for the difficulty, but it might also involve changing the system of fuel feed, as where gravity is employed, or the installation of an auxiliary feed for use under such circumstances, with the engine hermetically sealed and outlets provided, it would run under water.

MORE ABOUT DAIMLER AND THE TWO-CYCLE.

Editor THE AUTOMOBILE:

[635.]—I notice in the issue of February 21 the comments of T. J. Fay, in reference to what I said about the Daimler gas engine, which remarks seem for some reason to have made him quite sore, so much so that he seems to have lost sight altogether of the question that gave cause for the statement.

What I said of the Daimler design was true, and if it was not, Mr. Fay is not doing anything to show that it is not. Generalities about Daimler's pioneer work prove nothing. If I remember right, Brayton used liquid fuel long before Daimler did, but being hampered for means, failed to make as much of a success as his originality and talents deserved, which was far from being the reason why Daimler did not make a greater success of his. I think that I am safe in assuming that if Brayton had had the backing that Daimler had, gas engines would have been developed to a higher stage of perfection long before they were. A man's achievements have to be judged largely by his opportunities.

I still maintain that Daimler's construction was not so perfect as to justify referring to it as a precedent, justifying any kind of a design, as though that settled the question that Daimler's construction was above criticism. As I understand it, the only point at issue is whether my criticism of two-cycle engines that admit the charge into the cylinder through a checkvalve in the piston head, the piston head being the valve seat, was warranted by the facts of the case, which I think was fully answered in the reply, from which Mr. Fay is quoting, and to which he so much objects.

It seems to me that it is much better to base arguments as to the efficiency, or inefficiency, of any construction upon the reasonableness of the thing, rather than on precedent of some "has been" construction. The theory and practice of gas engine construction is being constantly revised; for instance, no longer ago than when Daimler made his first gas engine the almost universal practice was to leave one-third of the cubic capacity of the cylinder for compression space; now everybody believes in high compression, and it would seem absurd for anyone to try to prove that low compression was the best because Daimler's engines were low compression; I think that it is equally absurd to try to prove the efficiency of any other construction by holding up Daimler as an argument.

I am very glad to know that Mr. Fay is going to build a two-cycle engine, and wish him every success, and from his remarks about Mr. Loughheed's opinions, I infer that he intends not to follow the beaten path, but bring out something original. If I am right in my surmises, he might read over some of my writings which were recently published in "The Automobile"; the ones that I refer to were published in the issues of December 27, 1906, the other January 3, of this year. If, however, he intends to build the up-to-date standard two-cycle type, he would do well to read the articles published in "The Automobile" in the earlier part of the fall of 1906.

Unless he has had a wide experience in designing two-cycle engines, it will be worth his while to read over all of these papers, and see just what progress has been made in bringing the two-cycle up to "be somebody." I am under the impression that he has not quite kept up to the advancement that the two-cycle has already made. For myself, I have unbounded faith that the two-cycle will soon be the gas engine for every purpose where the greatest power, with the least weight, least complication of parts, are matters of any importance, and although there are no two-cycle engines yet on the market that fulfill my ideal as to some of the requirements, yet to-day it will develop more power than a four-cycle, size for size, and by some manufacturers and users of automobiles is preferred to the four-cycle. Come to think of it, it was perfectly natural that the four-cycle should be perfected first, before there should be much progress in perfecting the other, for that is the natural order of evolution, from the more complicated type toward simplicity. We welcome Mr. Fay to the ranks of two-cycle designers, and will all wait with breathless interest while he solves the problem of the perfect two-cycle gas engine.

C. P. MALCOLM.

Detroit, Mich.

CAN ANYONE CLEAR UP THIS MYSTERY?

Editor THE AUTOMOBILE:

[636.]—The writer would like to have you or some of your numerous readers explain if possible through your "Letters Instructive and Interesting" the following phenomena.

When at the end of last season's use my car was put away for the winter the lamps and generator were removed, leaving the rubber gas tubing which attached the copper tubing to the lamps and generator hanging loose and the ends of same open. A short time ago, when overhauling the car, parts of the copper tubing were found slightly bent in places, and upon taking the copper tubing in my hands to straighten these bends was very much surprised to hear, as soon as the bending was started, a considerable explosion and see flames shoot out the ends of these tubes. The explosion was nearly as loud as a pistol discharge, and of sufficient force to tear loose the section of rubber dangling on the ends and blow same across the garage, a distance of twenty or thirty feet.

There was no fire or open light to ignite any gas that may have remained in this tube during these weeks of idleness, and as can be well imagined the writer was very considerably surprised. On bending the other copper tube leading to the other lamp the explosion was repeated in exactly the same manner, and it seems quite improbable that the slight bending of the tube could create enough frictional heat to ignite a gas that might have remained in these tubes.

This is a new experience for myself, and if anyone can and will throw some light upon the cause of such explosion, would gladly have them do so through your valuable publication.

Schenectady, N. Y.

B. A. BURTISS.

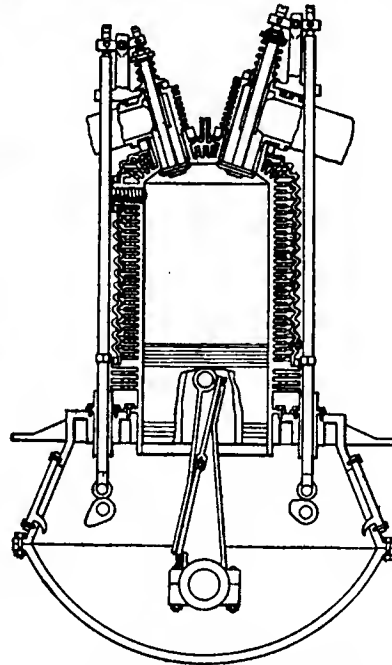
A COMBINATION COOLING SYSTEM MOTOR.

Editor THE AUTOMOBILE:

[637.]—Relative to letter No. 538 in February 21 issue of "The Automobile," by "A Subscriber," I would infer that the question has reference to a combination air and water cooling system, in

the nature of an interchangeable system, using either air or water without the changing of cylinders, it being understood that most of the motors in present use are on this order, as the heat must be extracted from the water by the air.

For your information, as well as for that of your subscriber, I would say that I have an engine, constructed upon the lines referred to, which has an increased cooling capacity for either air or water, with less weight to the cylinders in accomplishing the result; with a removable water jacket and an improved system of air flanges, all of which go to make an interchangeable cooling system. For your assistance on the subject, I submit herewith drawings of engine. If any other information regarding its



SHEPHERD'S COMBINATION SYSTEM.

advantages are desired, I will be pleased to furnish you with any details you wish; or should any of your readers wish to have the working of this system explained more at length, will do so.

Rutland, Ill.

C. G. SHEPHERD.

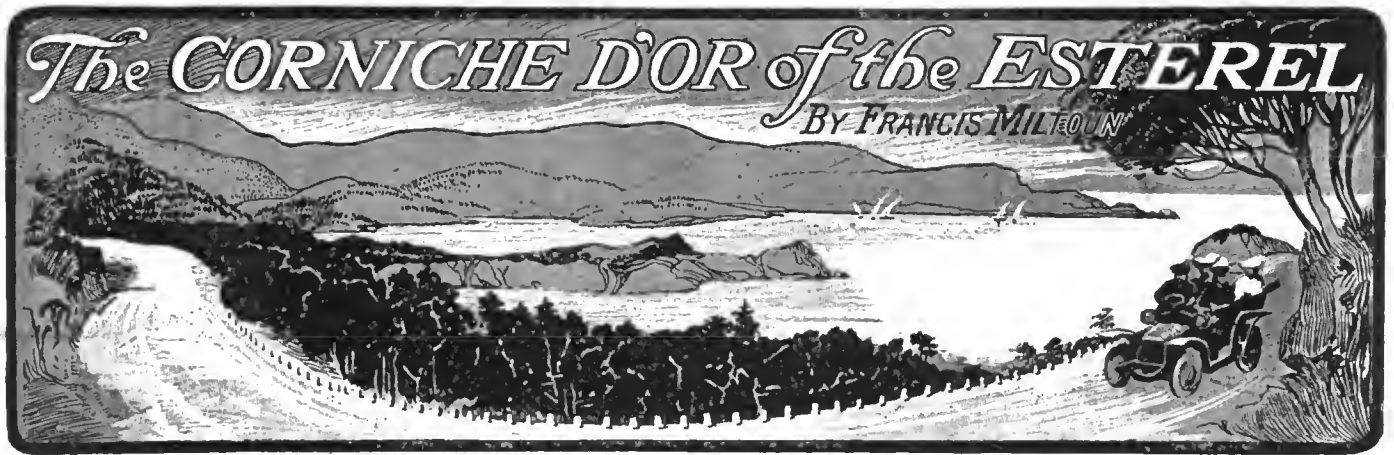
PRESS THE BUTTON AND LIGHT THE LAMPS.

Editor THE AUTOMOBILE:

[638.]—In your issue of February 21, under "Letters Interesting and Instructive," there is one, No. 583, signed W. L. K., relative to an appliance for lighting headlights by pressing a button. Would say that we have at the present time in operation a contrivance of this sort for lighting gas lamps which uses a jump spark and lights the lamps by pressing a button close to the seat of the car.

Amesbury, Mass.

GRAY & DAVIS.



ENTIRELY due in the first instance to the Touring Club de France, a great national road has been laid out in recent years along the edge of the Esterel range of mountains and the blue waters of the Mediterranean.

Not every Riviera tourist knows the wonderful region of the Esterel as well as he ought, and not every automobilist to the south of France passes by this new-laid-out "corniche"—the peer even of the more famous "corniche" between Nice and Monte Carlo—preferring to go by the old road, the Route d'Italie—to the north of Mont Vinaigre, the culminating peak of the Esterel, 2,000 feet in height and a dozen or more kilometers from the shore. This is all wrong. One should no more make the Riviera tour en automobile and miss this forty kilometers of the most superbly situated and ingeniously engineered roadway, perhaps, in all the world, than he should attempt to lunch en tour on a ham sandwich and a bottle of Vichy, as more than one scorching automobilist who was trying to tour Europe in ten days has done before now.

All Riviera tourists, and some others, know that the Esterel is a great curtain of reddish-brown porphyry rock which comes down to the Mediterranean just westward of Cannes and shelters that "ville d'aristocratic anglais," as the French call it, from the icy breath of the mistral of the Rhone valley. This much they know but not much else; they take their cue from what they remember of Lord Brougham's pilgrimage three-quarters of a century ago and think that there is nothing worth seeing on the Mediterranean coast west of Cannes, forgetting for the moment that the city of Fréjus spurned the offer of England's Chancellor to make it a winter rest-house for the noblesse of "brumeuse Angleterre." Perhaps the city fathers were wise to have rejected the proposition. Who knows?

Gateway to the New-Made Corniche.

At any rate, Fréjus is the gateway to the new-made "corniche" and is a dead, dull town with nothing at all of the life and conventional pleasures of the real Riviera. The Hotel du Midi at Fréjus is the last inn of its class to be found on the Riviera as one goes east. It is modest, frankly commercial, and you will have difficulty in spending more than nine francs a day for your food and lodging.

The Esterel range itself is to a great extent a vast dominial forest peopled largely by that species of evergreen pine known as the *pin maritime*. The forestry department of the Government

here steps in and has its say and tells you when you may and when you may not cut down trees, and where you may cut a path and where you may not, so that there has been considerable method in the laying out and opening up of this hitherto virgin fastness. Since 1891, only, have any but the inhabitants of the neighborhood ever explored this mountain wildwood which the French fondly compare to "le Yellowstone," but to-day there are 240 kilometers of forest roadway of which considerably more than half is practicable for automobile traffic.

That Radiator Repair Worth Remembering.

All the same there is a savagery about the interior of the Esterel which on occasion can offer something in the way of adventure, as for instance it once did in the writer's case. We were stalled in a grim, stony defile while the water had all trickled out of our radiator, or rather the hose-pipe connection had itself, in some way, mysteriously disappeared, *tout entière*. There was nothing for it but a twelve-kilometer walk over and back to the Auberge des Adrets to see what the Poste de Secours, thoughtfully established by the Touring Club de France for the benefit of distressed cyclists and automobilists, might offer. It didn't offer us anything that would do us any good, but this might have been expected. There was all sorts of little things which would help out with a refractory nut or bolt; there was copper and iron wire and a whole tire repair outfit; besides which there was a good workable pump and a first aid to the injured box of medicines. All very thoughtful and a blessing to anyone who might want these things—for which you pay nothing; though, unless you are a dead beat, you donate something to the "cantonnier" of the neighborhood who has the *boîte de secours* in his charge. We got a piece of hose-pipe finally from the garçon d'écuries at the auberge, and in spite of a three hours' delay took the road again none the worse off.

Four kilometers from Fréjus one passes through St. Raphael, unless, indeed, he wants to linger within the purlieus of this altogether delightful, unspoiled bit of the southland. In recent years it has grown to a population of 3,000 souls, and until one reaches La-Napoule there is no such metropolis as this on the whole "corniche."

Boulouris, Agay and Antéore are not even names recognized by most Riviera tourists, but one and all are delightful, little new-found spots which have not yet been exploited to the death, even though they have become possessors of a



OLD-WORLD STOPPING PLACE IN THE MIDI.

hotel-restaurant or pretentious establishments bearing the title of "Grand Hotel."

The Estérel Not for Sordid Automobilists.

If any automobilist is of the mind to rush through this wonderland "all out," he had best stick to the northern road and leave the corniche to the true vagabonds who like to linger where fancy wills. The sordid souls who have taken up automobiling merely for the sake of rushing through space will be quite as content with a circular track as with this twisting, turning road of the Estérel, even though there are some of us who think differently. One day, or two, or three, spent in the Estérel will be time well-spent and the pleasure and delight that will accrue will be immeasurable.

To reach the interior mountain roads one's best point of depart is from Agay; otherwise it is better to keep on to La Napoule and enter from the north.

Corsica Can Be Seen, 200 Kilometers Away.

More than 200 kilometers distant, bedded on the cloudy fringe of the horizon, one may sometimes see—not always—the angular heights of the Corsican isle. Northward the view is as entrancing; far beyond the foot-hills upon which rise Grasse, Castellane, Puget-Theniers, and their sister-towns of the Alpes-Maritimes and



PICTURESQUE MOUNTAIN ROAD.

the Var, may yet be seen the snows of the southernmost of the Alpine peaks proper, many of them of a height of more than three kilometers straight skyward, the queen of them all being "La Punta Aigentera," rising to a height of almost 5,297 meters.

From Trayas to Theoule is fourteen kilometers of daringly built roadway, now passing over a deep-cut bay or *calanque* and now freeing the railway by a sky-scraping viaduct and once and again sweeping a curve around some rocky promontory on a shelf cut sheer in the rock itself.

Only Six Francs a Day!

Things begin well with the Corniche d'Or the minute one launches his automobile on the road leading out from Fréjus, but before Agay has been reached one has warmed to it so that his appreciation of the latter half of the journey will know no words to do it justice. Right at the edge of tide-water one follows the western shore of the Golfe de la Napoule over which poets and painters have raved as they have over Capri and its grotto. Everything but nature itself is as yet in embryo and the disturbing influences of civilization have not yet become so great as to mitigate one's pleasure. At Theoule the Hotel de l'Estérel has arrived, but its pension prices have been until recently—and are still if the patron has not gone the way of most of his degenerate confrères on the Riviera—but six francs a day. Think of this! Ye who sport around at Atlantic city, Old Point, and Tampa Bay at prices anything you like to pay.

To avoid the five o'clock teas and "sportsmans" of La Napoule which comport so ill with the rare beauties of the Mediterranean littoral, it is well to keep the road a kilometer or so further and then turn abruptly to the left, leaving the coast behind. In a dozen kilometers or a little more, you will come to the Auberge des Adrets, a genuine unspoiled *logement* and not much more. To-morrow you can roll gently down into Cannes, "the ville of the Grand Ducs and the English aristocracy" and be as blasé as the rest of them, but stave it off for one more night anyway.

As Quiet as in the Days of Macaire.

There is nothing at the Auberge des Adrets to suggest modernity save the rushing by of an occasional automobile on the great "Route d'Italie" in the dead of night. For the rest it is as quiet and tranquil as it was in the days when Macaire and his fellows held up unsuspecting travelers by coach and chaise and relieved them of their all.

It is all very crude and rough here and you may get a bed for a franc and a *repas* of a primitive order for another franc—or more, if you choose to pay it. The wind sighing through the *chataigniers* will lull you to sleep and as you wake in the morning with the sun just tipping the summit of Mont Vinaigre you will be almost ready to give up automobiling and go back to the old days of the romantic *poste-chaise*. You won't seriously think of do-



BESIDE THE BLUE MEDITERRANEAN WATERS.
ON THE CORNICHE D'OR.



A VIEW OFF SHORE.

ing this, of course, for we have become spoiled in recent generations, but the thought will occur to you nevertheless.

All this tranquillity and romantic idealism is within a dozen kilometers of the nerve-destroying distractions of Cannes, Nice and Monte Carlo, or at least the gateway thereto; where you become a frequenter, whether or no, of the Cercle Privé, of tea-shops, of alleged American bars or of Monte Carlo's game and restaurants who serve "les mutton chops" and "pal' ale."

Touring Club Helped Build the Estérel Road.

The Estérel road was planned and built by the combined efforts and expense of the French nation, the Départements of the Alpes-Maritimes and the Var, the Touring Club de France, and the P. L. M. railway. This latter seems somewhat of an anomaly—a railway contributing to build a stretch of roadway which shall be in direct competition with its own powers and functions—but it is a fact, nevertheless. As an engineering triumph the road must rank as one of the great works of its class of any age—and they were mighty good road-builders in France even in the days of the Romans.

For almost its entire length the road runs beside the *chemin de fer*, crossing ravines and gullies often on the same shelf of levelled rock. For the most part it is something over ten meters in width, but in places it narrows down to half this. There are no rises or descents which exceed 5 per cent., and when these one in twenty grades occur they are not very long.

THE COMING MOTOR BOAT RACES AT MONACO

IN numerical value the great annual motor boat meeting to be held at Monaco April 1 to 16 surpasses all its immediate predecessors. When the entry list closed this week the International Sporting Club of Monaco, which organizes this meet, had enreregistered a total of 90 boats in all classes. As is always the case in these meetings, a certain proportion of the entrants will fail to put in an appearance at the starting line, but with this allowance the number will be sensibly above that of last year's meeting, which united sixty-six actual starters.

As in previous years, the Monaco programme will consist of an open-air exhibition in the picturesque ground of the Condamine, with the bold cliff as a background and the blue waters of the Mediterranean in front. It is an ideal spot for an early spring sojourn, and it is no matter for wonder that the fortunate and elegant idlers of the wide world congregate in the neighborhood at this time of the year. Monaco is important as a society meet, but it is surpassed as a sporting enterprise. Three distinct classes of boats are provided—cruisers, racers and sea-going vedettes. Cruisers are divided into four classes, with a limited length and proportionate cylinder capacity, beginning with 20-foot boats having 21-2 liters cylinder area and proceeding by stages to comfortable, roomy cruisers of 60 feet over all and a 15 liter motor. Only two classes are provided for the racers, up to 26 feet over all and above 26 feet in length. The sea-going vedettes are a new class now being given considerable attention, with a

view to their adoption in the fighting marine. The regulations stipulate that the length of these craft shall not be more than 25 feet, and total weight 2,640 pounds, all included except the motor and its piping. A number of these small rapid boats have been built for the French navy, to be used for vedette service in the home waters, but this is the first time that they have had a class provided for them in the Monaco meeting.

Monaco maintains its reputation for big prizes. The four classes of cruisers have \$5,800 in cash as their prize money, the two racing classes will compete for \$3,800, the vedettes have \$3,000 and the poorly represented hydroplane class can win \$600. In addition there are \$8,800 devoted to a number of handicap races for cruisers and racers, the championship of the sea, and the mile and kilometer records. Among the trophies are the Prince of Monaco's Cup and a magnificent work of art presented by M. Thomson, French Minister of Marine, for competition among the vedettes. With a grand total of \$22,000 in cash, it cannot be doubted that the competitors will win more than will cover their heavy expenses, while the advertising value of a series of victories will be worth no small amount. Unlike the big motor boat meetings in America, the Monaco tournament is a purely trade display. Even the cruisers are entered and run in most cases by either the hull maker or the engineer, or the two in

conjunction. The racers, though in a few cases piloted by wealthy sporting amateurs, are purely trade boats, as is indeed indicated by such titles as *Panhard-Tellier*, a Panhard motor in a Tellier hull; *Mercedes-Florio*, *Itala*, *Daimler*, *Antoinette*, etc. The same thing applies to the vedettes, the success of which in the races will doubtless largely influence their adoption by the naval authorities.

There has been a healthy development, but no radical changes in the cruisers. Earlier tendencies of the French to construct only light boats for river work are not now so pronounced, a number of the new boats being large, comfortable cabin craft, capable of facing a reasonable amount of rough weather. Two at least of the new cruisers use kerosene as fuel.

Racers are still the center of attraction, despite the prophesies that were issued of their speedy disappearance when early blunders brought upon them

the witticism of the world. Though slightly decreased in numbers, they are, however, of greater interest than ever before. The utter disproportion between hull and motor, river-going hulls for sea service, and inadequate protection for the motor against flying spray and an occasional wave breaking on board have been largely remedied in this year's craft. Hulls were more at fault than the motors, with the result that few of the more powerful craft could be let out to full power for fear of a collapse. In the first series of racers there are but half a dozen boats all close to their 26 foot limit and all of considerable interest. *La Ra-*



SPECIAL MERCEDES ENGINE IN FRENCH HULL FOR ITALIAN OWNER.

pière II., the successor of the famous but unfortunate *Rapière* with which Tellier defeated all comers, will be watched with considerable interest. Panhard-Levassor is responsible for the engine work and Tellier & Gerard are the builders of the hull. The Antoinette Company, famous for its lightweight motors for flying machines and motor boats, presents a 24-cylinder motor in a boat bearing the name *Antoinette V.* The Itala firm has a 135-horsepower motor in a 26-foot hull christened the *Itala*. Fiat has engaged a fast boat bearing their name to be driven by an 8-cylinder engine. The most remarkable boat of the meeting is the *Mercedes-Florio*, owned by the well-known Italian sportsman, the Chevalier Florio and engined by the Mercedes firm. The hull is entirely of steel, 26 feet 4 inches long, 97 inches wide, drawing 7 inches of water. G. Pitre, the boat builder of Maisons-Laffitte, near Paris, has designed the hull on entirely new lines. The bow is of the form of a horseshoe, the sides are perfectly straight and the stern is squared, the object being to reduce surface friction to a minimum. The hull is divided into four compartments; forward is a water-tight compartment, next the open engine pit, protected by high combings and provided with a movable, water-tight hatch; a small cockpit for the pilot, containing two gasoline tanks, with a special arrangement by which the gasoline can be rapidly



HENRY FOURNIER'S FAST CRUISER WITH ITALA ENGINE.

emptied into the sea in case of fire, and a large water-tight compartment astern. The craft is a marvelous piece of metal work, exceptional care having been taken in the rivetting of the thin plates to produce a light but very strong boat. The boat has two rudders. A special 6-cylinder 150-horsepower Mercedes motor supplies the motive power. Pitre expects to reach a speed of forty-five miles an hour with this original gliding boat.

The big racers over 26 feet in length comprise seven or eight entirely new boats and a small number of last year's racers. Brasier continues the *Trefle à Quatre* series with a *Trefle à Quatre II*, carrying a 4-cylinder 120-horsepower Brasier motor in a wooden hull. Henry Fournier will pilot a fast *Itala* boat of about the same horsepower; the Chevalier Florio will have an *Itala* motor in his big *Jeanette*; Panhard will engine the *Panhard-Tellier* and the *Paris*, the latter with a 135-horsepower Grand Prix type of motor, driving two propellers; Dietrich will have the *Lorraine-Dietrich*, equipped with a 130-horsepower motor of the type that was so successful in the Ardennes Circuit; *Mendelssohn IV* is another powerful lightweight motor bearing the name of the maker of its engines; the *San-Giorgio* will defend the fame of the Italian firm of that name. The English, who have always been greater rivals of the Latin races on water than on land, present a strong trio in the *Daimler II* and *Daimler III*, both owned by Lord Howard de Walden and engined by Daimler of Coventry, and a craft built by Saunders for Lionel de Rothschild to be engined by Wolseley.



STERN VIEW OF MERCEDES-FLORIO GLIDING BOAT.

Despite the encouragement that has been given them, hydroplanes will not be well represented. It is probable indeed that the only starter will be the *Nautilus-Obus*, built by Deschamps & Blondeau and engined by Mutel. This curious craft consists of two floats, each 6 1-2 feet long by 6 1-2 feet wide, united by an ash framework stiffened by metal stays. The frame is 23 feet long by 23 inches wide. The total length is 28 feet and the total weight 1,210 pounds. The frame is fixed to the two floats by two axles and springs like those used on an automobile. On the foremost float is placed the 4-cylinder 55-horsepower motor, and on the other the pilot's seat, the gasoline tank and a steering wheel and column, as in an automobile.

A NOVEL FLOOR PLANING MACHINE.

Although American automobile manufacturers have not yet obtained much hold on the French automobile market, various kindred and tributary industries are better represented in the home of the auto than is generally imagined. The accompanying illustration shows an American motor floor-planing machine at work on the Velodrome d'Hiver cycle track in Paris. The machine, which is being demonstrated in Europe for an American manufacturer by O. L. Pickard, automatically planes a floor and



AMERICAN OPERATOR AND MACHINE PLANING PARIS TRACKS.

gathers up its own shavings. The Velodrome d'Hiver on which the experiment is being made is a very popular winter indoor cycle and motor cycle racing track, forming a part of the huge machinery hall of previous international exhibitions. There are about half a dozen of these cycle tracks in the French capital, most of them open only in summer; the one in question is closed in summer and open in winter. By this arrangement interest in track racing is kept alive all the year round. A sight of the crowds leaving the "Vel d'Hiv" any Sunday afternoon is sufficient proof that the sport has lost none of its old charm for the French.

THE AUTOMOBILE AS A MONEY EARNER.

Early holders of stock in the now world-famed automobile firms are reaping a rich reward as the result of their foresight, sagacity or luck. To take but a few of the best known French automobile concerns, Panhard & Levassor shares issued at 10,000 francs were quoted at 65,000 francs at the beginning of this year. In a recent commercial deal their value was fixed at 105,000 francs, or more than ten times par value. Darracq shares issued at 25 francs are now worth 75 francs. Dietrich shares with a nominal value of 500 francs are now quoted at 1,100 francs. Rochet-Schneider has passed from 500 to 3,000 francs. Richard-Brasier, C. G. V. and Krieger shares have increased in market value 150 to 500 per cent. Such tire houses as Michelin, Hutchinson and Bergougnan pay annual dividends of from 10 to 25 per cent. Congo Colonial Societies, whose chief product is rubber, have been phenomenally successful.

MOSTLY ABOUT THE EASTERN CLUBS

Recent Activities of the Busy Cleveland Club.

CLEVELAND, March 11.—The Cleveland Automobile Club is working out two new schemes of benefit to its members and to automobilists in general. One of these is the publication of a register of the numbers and names of automobile owners in Cleveland and vicinity, as well as the make of the car. The names will be given in alphabetical order in one section, while in another the list will be arranged according to the license numbers. The records will be brought up to date at frequent intervals. Another innovation is a registration bureau for chauffeurs. A large number of chauffeurs have already registered with Secretary Asa Goddard, and he has found positions for a number of good men with owners who will have new cars in the spring. No charge is made at this intelligence office, either to the chauffeur or to the employer; furthermore, Secretary Goddard does not recommend a man until he has assurance that the applicant is a skillful and careful driver and is familiar with the handling of any make of car. Mr. Goddard is co-operating along with the Y. M. C. A. automobile school in this work.

The recent automobile show greatly benefited the Cleveland Club. The club had a special reception room at the show, and as a result of the missionary work done at that time more than fifty new members have been secured. This is but one of the many evidences of the wonderful increase in the number of those interested in the automobile in Cleveland.

Secretary Goddard delivered an address at the opening of the Y. M. C. A. school's spring term. He spoke of the development of the automobile industry and its future and the kind of training men need in order to enter the work as shop employees or drivers. Mr. Goddard expressed the opinion that twenty years hence horses will be an unknown quantity in the streets of large cities and that motor vehicles will wholly supersede them.

Fuel Test Not Included in New Jersey Endurance Run.

NEWARK, N. J., March 9.—Economy in fuel consumption will not figure in the endurance contest of the New Jersey Automobile and Motor Club to be held on May 30, 31 and June 1. Owing to the difficulty of arriving at a basis satisfactory to touring machines and runabouts of different horsepower, it was finally decided to drop the fuel test entirely. The action does not meet with the approval of all contestants; for, owing to the especially good nature of the roads over which the run will be held, it is feared that a number will tie for the trophy. Strict adherence to the speed laws and a prompt arrival at the controls will now be the feature of the tour. A driving schedule will be fixed, any car arriving at the controls ahead of time will be fined two points for each minute, while late arrivals will cost the delinquent one point per minute. The trophies will be the Shanley cup for touring cars and the Sinclair cup for runabouts.

A. C. of Buffalo Will Listen to Mr. Glidden.

BUFFALO, N. Y., March 11.—Secretary D. H. Lewis, of the Automobile Club of Buffalo, announces that Charles J. Glidden, donor of the Glidden trophy, will deliver a lecture to the members of the club, March 22. The affair will be known as "Ladies' night." Concert Hall has been engaged for the occasion. Mr. Glidden's subject will be, "The World as Seen from a Motor Car." The lecture will be illustrated with stereopticon views.

At the recent meeting of the club twenty-five new members were elected. The membership of the local automobile club is increasing with such rapidity that it will soon be one of the largest automobile clubs in the world. There is a strong probability of more members being added in the near future.

Capital City Autoists Get a Speed Limit Doubled.

WASHINGTON, D. C., March 11.—Automobilists of Washington are delighted with the action taken last week by the town council of Glen Echo, Md., in amending the ordinance regulating the speed of automobiles within the corporate limits of that town by increasing the speed limit from six to twelve miles an hour. This gratifying action was the result of a recent conference between R. B. Caverly, president of the Automobile Club of Washington, and the Washington Automobile Protective Association; C. M. Fulton and W. S. Duvall, attorneys for the association, and John Garrett, mayor of Glen Echo.

This conference was held in Washington, and during its course the representatives of the automobilists admitted their defeat in their efforts to prove that the town of Glen Echo and Montgomery county had no jurisdiction over the Conduit road in criminal cases. They suggested that the town ordinance be amended so as to conform with the State law, which fixes the speed limit at twelve miles an hour. They also agreed to drop all the pending litigation. This was agreeable to the Glen Echo authorities and the necessary amendment to the town ordinance was thereupon made.

Motor Scooter Club of America Formally Organized.

NEW YORK CITY, March 11.—An addition was made to the calendar of national sporting clubs by the formation of the Motor Scooter Club of America at a meeting held at Madison Square Garden last week. This sport is becoming popular in the neighborhood of the Great South Bay, L. I., and many residents are showing their interest in these original craft since Nathaniel Roe showed how to rush over the ice surface at a speed that made the sail boats look sluggish. The unusual cold of the winter has enabled the devotees of the sport to enjoy it to the fullest extent, and the new club contemplates arranging a series of races next season. There will not be much active racing this winter owing to the fact that the ice on Great South Bay may break up at any time. The list of members includes many prominent Long Islanders and New Yorkers, among them being Harry Payne Whitney, August Belmont, W. K. Vanderbilt, Jr., Jefferson DeMont Thompson, A. R. Pardington, E. R. Bellman, James L. Breeze, John Masury, Sidney Breeze, Judge Jaycock, William A. Franklyn, John Sylvester, H. H. Harrison, George Wilson and Ferdinand Rockwell.

Philadelphians Hold Annual Feast with Great Eclat.

PHILADELPHIA, March 11.—The annual banquet of the Automobile Club of Philadelphia, at the Manufacturers' Club, last Friday night, was chiefly remarkable for the rather broad hint given by Alfred T. Chambers of a coming resumption of amicable relations of the club with the A. A. A., and a return to the national fold of not only the Philadelphia organization, but of all the clubs composing the Pennsylvania Motor Federation as well. This statement, coming as it did on the heels of the recent action of the Quaker City Motor Club in appointing a committee to get in touch with the automobile clubs of the State, with a view of forming a State organization, assures, in the opinion of "those in the know," an early return of the secessionists to a place under the banner of the national organization. When Toastmaster Jacob J. Leeds introduced the Governor of the State, Edwin S. Stuart, there was a storm of applause. His Excellency paid a deserved compliment to the automobile when he stated that without it he might have been defeated. It had enabled him to attend as many as half a dozen meetings in a single night and to address thousands where, under other conditions, his auditors would have been numbered in the hundreds. He expressed himself as being heartily in favor of State

highways, and said that no better way could be devised for benefiting *all* the people of the State than by spending large amounts annually on the improvement of the roads. He promised to do all in his power to further the objects of the State's automobilists along these lines, especially in such an expenditure of the appropriations as would benefit large bodies of the people.

Mayor Weaver was at his best. An ardent automobilist himself, he could speak intelligently on the needs of motor car owners. He realized the need of automobile trunk lines, and called attention to Massachusetts' splendid roads as examples of what Pennsylvania automobilists should aspire to along this line. Turning to the speed limit problem, Mayor Weaver said he had that very afternoon, at a meeting of the Fairmount Park Commission, urged the abolition of the present seven-miles-an-hour ordinance now in force in that popular pleasure ground and the substitution of a fifteen-mile limit.

The excellent prospects of the good roads bill now before the legislature were discussed by Highway Commissioner Joseph W. Hunter. He took a shot at the toll gates, and said his plans contemplated the abolition of that bete noir of all automobilists. One of the first roads that will receive the attention of his department in this respect, he said, will be the old national highway between this city and Pittsburg.

Addresses were also made by Henry F. Walton, who told of the work of the Pennsylvania Road Makers' Association, and by Director of Public Safety McKenty, who advocated more liberal speed regulations in city and country.

Quaker Hill Climb to Be Held in Fairmount Park.

PHILADELPHIA, March 11.—City Line road, from the east end of the Schuylkill River bridge, in Fairmount Park, to the extreme top of the hill on the west bank, has been selected by the Contest Committee of the Quaker City Motor Club for its hill climb on Memorial Day. The course, which is about a mile long, with easy going at the start and finish and the hard sledding in the middle, is amply wide and sufficiently steep to afford interesting racing, while from the viewpoint of the spectator it is ideal—easily reached by trolley and affording an excellent view of almost the entire route. The last quarter is an easy up-grade to the finish at Belmont avenue. The committee has arranged a program of eight events, classifying the cars according to price.

1. For cars valued at \$2,000 and under.
2. For cars valued between \$2,000 and \$3,000.
3. For cars valued between \$3,000 and \$5,000.
4. For cars valued at \$5,000 and over.
5. American championship, open to all American made cars. To carry four passengers and complete equipment.
6. Free-for-all championship. Open to all cars.
7. Record trial.
8. Quaker City Motor Club championship. Open to all bona fide members who are not in the automobile business.

Election of the Automobile Club of Hudson County.

JERSEY CITY, N. J., March 11.—At the annual meeting of the Automobile Club of Hudson County, held at the clubhouse, corner of Clinton and Crescent avenues, the following officers were elected for the coming year: President, J. V. Z. Anthony; vice-president, John P. Landrine; board of governors, J. H. Edwards, H. T. Pond, Herbert Scott, E. M. Dixon, Dr. L. A. Opdyke.

Pennsylvania Federation Working for Its Bill.

PITTSBURG, March 11.—Active work is being done by the Pennsylvania Motor Federation in the interest of the new Motor Vehicle bill prepared by them. Twelve thousand circular letters to motorists of Pennsylvania left Federation headquarters last week asking the aid of each resident of the State holding a license to put this through. A committee is also at work at Harrisburg.

THE AUTOMOBILE CALENDAR.

AMERICAN.

Shows.

- March 18-23....—Providence (R. I.) Automobile and Power Boat Show, Infantry Hall, F. M. Prescott, manager.
 March 21-23....—Toledo, O., Automobile Show, Coliseum, Toledo Dealers' Association.
 March 21-30....—New Haven, Conn., Second Regiment Armory, Automobile Show, under the auspices of the local dealers.
 April 1-6.....—St. Louis, Mo., Automobile Show, Jai Alai Building, St. Louis Automobile Dealers' Association.
 April 6-13.....—Montreal, Canada, Second International Automobile and Sportsman's Exhibition, R. M. Jaffray, manager, 309 W. Notre Dame street.
 April 8-13.....—Pittsburg, Pa., First Annual Show of the Pittsburg Automobile Dealers' Association, Duquesne Garden.

Races, Hill-Climbs, etc.

- April 1.....—St. Louis, Mo., Auto Floral Parade, Automobile Club of St. Louis.
 April 8-9.....—Harrisburg, Pa., Two-day Endurance Run, Automobile Club of Harrisburg.
 May 30.....—Philadelphia, Hill Climb, Quaker City Motor Club.
 Oct. 19.....—St. Louis, Mo., International Aerial Race for the Gordon Bennett Prize, Aero Club of America.

Motor Boat Races.

- June 8.....—670-Mile Ocean Motor Boat Race, New York to Bermuda, Motor Boat Club of America and Royal Bermuda Yacht Club.
 July 20.....—New York to Marblehead, Mass., 270-mile Motor Boat Race, New Rochelle Yacht Club.
 Sept. 2-6.....—Jamestown (Va.) Exposition, Motor Boat Races.

FOREIGN.

Shows.

- March 7-16....—London, Olympia Commercial Vehicle and Motor Boat Show.
 March 15-23....—Edinburgh, Scottish Cycle and Motor Show.
 Mar. 24-April 1.—Prague, Austria, Automobile Show.
 April 6-13.....—London, Agricultural Hall Motor Show.
 May 4-15.....—Madrid, Spain, Automobile Exhibition, Palace of Fine Arts, Royal Automobile Club of Madrid.
 May 15-26.....—Zurich, Third Annual Swiss Automobile Show.
 June 25-30.....—St. Petersburg, Russia, Automobile Show.

Race Meets, Hill Climbs, etc.

- March 20-27....—Nice (France) Automobile Week.
 April 1-16.....—Spring Wheel Competition, A. C. of France.
 April 2-15.....—Monaco Motor Boat Exhibition and Races.
 April 21.....—Targa Florio Tour (Sicily), Auto Club of Milan.
 April 25-28.....—Touring Contest, Automobile Club of Touraine.
 April 28.....—Chateau Thlerry Hill Climb.
 May 18-21.....—Milan, Italy, Touring Club Trials.
 May 24-27.....—Voiturette Contest, Automobile Club of Austria.
 May 28.....—Isle of Man, Tourist Trophy Race, Automobile Club of Great Britain and Ireland.
 May 30.....—Isle of Man, Heavy Touring Car Race, Automobile Club of Great Britain and Ireland.
 May 29-June 1.—Irish Automobile Club Reliability Trials.
 June 3-12.....—Herkomer Cup, Automobile Club of Bavaria.
 June 14.....—German Emperor's Cup, Taunus Circuit, Imperial Automobile Club.
 June 20-22.....—American Gold Cup, Start from New York of European Tour for American Cars, Georges Dupuy, secretary, 1402 Broadway, New York City.
 June 14-29.....—Scottish Reliability Trial, Scottish Automobile Club.
 July 2.....—Grand Prix, Automobile Club of France.
 July 14, 1908....—Paris to London, Aerial Race.
 July 15-18.....—Ostend Week, Record Trials, Automobile Club of Belgium.
 July 21.....—Ardennes Circuit (Belgium).
 July 31.....—Liedekerke Cup for Touring Cars, Ardennes Circuit, Belgium.
 July 31-Aug. 8.—Belgium Regularity Contest for Touring Cars, A. C. of Belgium.
 August 1-7.....—Criterium of France, 1,750 Miles Touring Competition and 250-mile race for the Press Cup, A. C. of France.
 August 11-20....—Coupe de Auvergne.
 Sept. 1.....—Italy, Brescia Circuit, Florio Cup, A. C. of Italy.

AEROPLANISTS MAKE TRY-OUTS.

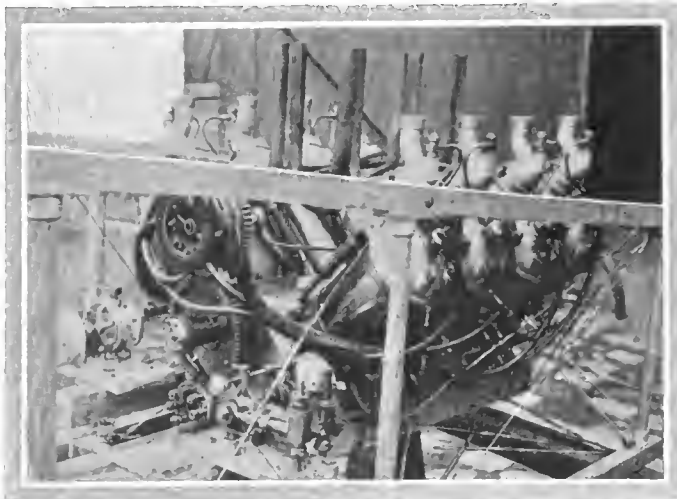
PARIS, March 5.—Notwithstanding the particularly severe winter, aero men have displayed much activity in the building shops and an impatience to practically test their new flyers. M. Kapferer brought his new aeroplane out on the Bagatelle ground, but did not attempt flight owing to a few defects discovered at the last moment and the rather unfavorable state of the weather. M. Leon Delagrange chose the military drill ground at Vincennes on the eastern border of Paris for the experimental trip of his flying machine. The Delagrange machine is similar in general construction to the latest Santos Dumont aeroplanes, consisting of a number of cells formed by a light wooden frame covered with silk. It has a total carrying area of about sixty square meters for a weight of 640 pounds. The rudder is placed in front and a 40-50 Antoinette motor drives a two-bladed propeller at the rear. The motor is of the eight-cylinder type with cylinders forming V and induction feed. Gabriel Voisin, the builder of the aeroplane, mounted the machine for the trial trip, which was witnessed by a select number of aero experts and a big crowd of Vincennes idlers. Seated on a saddle above the two wheels supporting the machine, Voisin made a good start and ran a few hundred yards at a speed of sixteen or eighteen miles an hour. The ground had been ploughed up by the frequent passage of heavy field guns and mounted troops, and under the heavy strain imposed the machine suddenly collapsed and came to a stop. Voisin's position looked dangerous, but he extricated himself without much difficulty. The motor was uninjured, but the propeller shaft was bent and severe damage done to the frame. It will probably be ten days before the machine will be ready to attempt another flight. So far as can be judged the framework is too light to stand the strain of fast travel. M. Voisin says he is certain of a successful trip.

The latest automobile constructor to enter the aero field is the Marquis de Dion, head of the firm of De Dion-Bouton. He has constructed a model of an aeroplane one-tenth actual size, and is now making equilibrium experiments with the apparatus.

AERO EXPERTS SAIL FOR FRANCE.

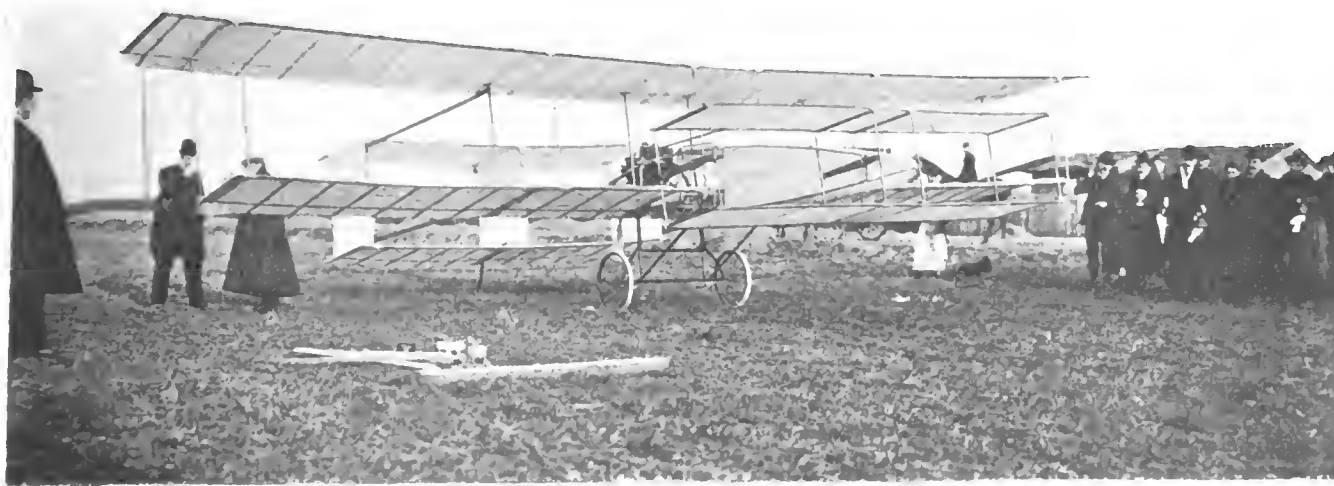
ST. LOUIS, March 11.—The St. Louis Aero Club will become the possessor of several new balloons this season. About a month ago an order was placed with a French builder for a varnished cotton balloon of 80,000 cubic feet capacity, to be used in the Gordon Bennett balloon race next October. The balloon will be called the *St. Louis*. Alan R. Hawley, who will pilot

the *St. Louis* in the race, has placed an order in France for a smaller balloon of 50,000 cubic feet capacity to be used by him for ascensions in and around New York. Several members of the St. Louis club are endeavoring to raise funds for the purchase of a small club balloon. If the necessary amount is obtained, the order will be placed in France. It is also possible that the balloon *United States*, with which Lieutenant Lahm won the first Gordon Bennett race, may be purchased by the club. A. B. Lambert, one of the charter members of the St. Louis club, has sailed for Europe and expects to be joined by Alan R. Hawley early in May. They will make ascensions in the two balloons

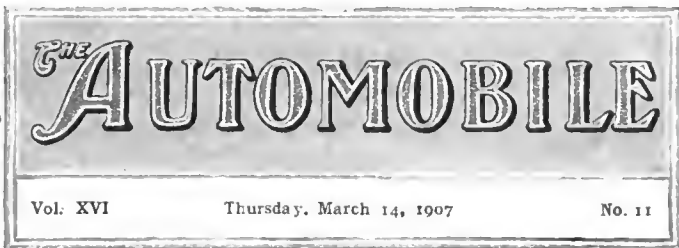


ANTOINETTE 40-45-H.P. AEROPLANE MOTOR.

under order and Mr. Lambert will endeavor to obtain the pilot certificate of the Aero Club of France. Since the Aero Club of St. Louis was organized last January, the plans for the big race in October have been practically perfected. The club has just appropriated \$15,000 to fence in the fourteen acres of Forest Park that have been granted for the use of the balloonists. Grand stands will be erected and a number of canvas aerodromes will be set up as quarters for the different nationalities entered in the contest. The balloon ground is only a short distance from the main gas works and a system of pipes has already been installed connecting the largest gas tank with the field. Four million cubic feet of gas can be supplied if necessary.



DELAGRANGE AEROPLANE READY FOR ITS EXPERIMENTAL FLIGHT ON THE DRILL GROUND AT VINCENNES.



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Boston's Show a Great Record-Breaker.

If there has been any doubt in the minds of the powers that be in the various strongholds of the industry as to the exact status of the Boston show, surely the present event must have sufficed to banish it completely. Though secondary in importance from the viewpoint of the manufacturer in that it is purely a dealers' show and, in many respects, more or less local in its character, there is no show held anywhere in the country that has better justified its existence. And this despite the fact that it is perforce relegated to a time of the year when all concerned would much prefer to be able to devote their entire time and energy to other interests. More than that, Boston labors under even greater disadvantages in the matter of suitable exhibition buildings than most other cities, having to make the best of structures poorly adapted to the purpose, with an overflow situated several blocks from the main building.

The event now under way at the Hub and which will close next Saturday night is the fifth of its kind to be held there, and it will go down into history not alone as the most successful show that Boston has ever seen, but the largest aggregation of cars and accessories ever brought together in this country. If mere numbers go to make success in a thing of this kind, both the national shows held in New York and Chicago must take a back seat, for Boston has outdone them all in the matter of size and completeness. There are no less than 121 cars of different makes exhibited, so that, although it has never been accorded that title in the past, nothing of the kind ever held in the United States

can justly be said to be more truly representative of the industry as a whole, and in that respect, national, than the down-east gathering of this year.. Whether it be gasoline, steam or electric, there would hardly seem to be a well-known car made in this country that is not represented, and, true to precedent, this year's show has been productive of the usual number of newcomers, not a few of which exhibit productions of an order that may well rank with the best efforts of old-established makers. And as is to be expected in conjunction with such a notable array of cars, the showing of accessories is on a similar scale. Taken all in all, Boston and its dealers may well be proud of the fact that they have been instrumental in bringing together the most complete showing of automobile products ever assembled at a similar event anywhere in this country, and that is saying a great deal.



The Demand for Earlier Show Dates.

With manufacturers knocking the calendar all awry by bringing out their models of the following year at least six or seven months in advance, so that plenty of 1907 cars had a good chance to be old in service before 1906 expired, and starting on their 1908 product long before the 1907 touring season has even opened, it is little wonder that there is an insistent demand for much earlier show dates. Within the past two years, some of the makers have caught up with themselves and gained a lap, so to speak—they are working almost a year ahead so far as designs are concerned and if they keep on making progress at the rate that some of them have been beating the calendar, it will be no surprise to see exhibits at next winter's shows labeled, "Model of 1910."

The time when the majority of makers had to concentrate every effort for several months before the advent of the show on a few sample cars to be exhibited at the latter, and then retired to build a few more to fill the orders they had booked, has become so much a thing of the past as to be practically forgotten. Manufacturing conditions have changed entirely and the demand for time in which to build cars in order to make early deliveries possible overtops all other considerations. Hence the need for earlier shows and makers and dealers in all parts of the country are unanimous on this point. From present indications it appears that this may mean a show in the Garden in November, the Palace and Chicago shows in December, and the Boston show in January—cutting the show season practically in half.



The Dust Problem Again to the Fore.

Though it is far from being an ideal season for touring or, for that matter, one that favors the use of the automobile in any respect, there is one thing that can be said of winter, which the great majority of autoists are unanimous in hoping may some day be equally applicable to seasons of the year when the weather is not quite so rigorous, and that is its absence of dust. Winter roads are a combination of snow, ice and frozen ruts of mud that work havoc with tires and are not negotiable without the aid of devices which also tend to raise the tire bill, but above all they are dustless. What that means can only be appreciated by the rural dweller along some highway frequented by automobiles, and no less by the autoist himself, when perforce he finds himself compelled to breathe the choking cloud.

Vast sums of money are being raised in this country for the work of road building and road improvement, and in the aggregate millions of dollars will be spent in the work during the coming season in a comparatively few of the Eastern States. Experience has shown that the ancient methods of road building thus far adhered to are no better suited to horse traction than they are to the automobile. If a road is to be permanent, it must be proof against rapid disintegration, and not until steps are taken to this end will we have anything even approaching a dustless road. It is to be hoped that the large sums to be spent will not be frittered away in doing something that will shortly have to be done over again at equally great expense.

CUTLER SUCCEEDS DAY IN THE A. L. A. M.

"Owing to the continued illness and absence of George H. Day," reads the typewritten statement given out by the ruling body of the A. L. A. M. at the end of a two days' session, "E. H. Cutler has been placed in charge of the association as chairman of the Executive Committee, and enters upon his duties at once. Mr. Cutler has been prominently identified with the industry for many years, having been president of the Knox Automobile Company, Springfield, Mass., since its inception, president of the N. A. A. M. for two years, and for several years a member of the executive committee."

GILSON AND BENSON MAKE CHANGES.

Ernest R. Benson, for a number of years manager of the Boston branch of the Hartford Rubber Works Company, has been elected secretary and sales manager of the parent company, with headquarters at Hartford. J. W. Gilson, his predecessor in office, resigns to go with the Mitchell Motor Car Company, a prominent member of the American Motor Car Manufacturers' Association as sales manager.

INDIANA MAKERS AID A Y. M. C. A. PROJECT.

INDIANAPOLIS, IND., March 11.—Quite a remarkable campaign for raising funds for a new Y. M. C. A. building closed here the other day. In two weeks' time \$250,000 was raised. The success of the undertaking was due largely to the aid given by automobile manufacturers and dealers. C. E. Test and A. G. Newby, of the National Motor Vehicle Company, and D. W. Marmon, of the Nordyke & Marmon Company, contributed \$1,000 each to the cause, while Carl G. Fisher, of the Fisher Automobile Company, telegraphed a subscription of \$500 from New York City.

A. L. A. M. DISCUSSES EARLY SHOWS.

While "nothing definitely decided and nothing to make public" is the only response forthcoming to an inquiry as to what was done at last week's meeting of the Executive Committee of the Association of Licensed Automobile Manufacturers, it is a matter of common knowledge that show business was the chief thing before the meeting, and that the advisability of an earlier date was very much to the fore. It is definitely announced that the option on Madison Square Garden held by the association will be availed of and the show held there for the next two years at least, and it is further thought the next event of the kind will be in November instead of January, as heretofore. It is also understood that the matter of admissions was up for discussion, and that, owing to the cramped quarters and great demand, there seems to be little doubt but that prices will be doubled, and probably quadrupled, at least on one or two days of the week. The report of the treasurer, H. H. Franklin, showed the association to be in flourishing condition financially.

AMERICAN CARS FOR THE VANDERBILT CUP.

Entrants for the American Elimination Trial of the Vanderbilt Cup race are being announced, and an increased number over that of last year appears to be assured. The Royal Tourist, Lozier, Welch, Ford and Moon are newcomers to the 1907 list, while the repeaters will include Locomobile, Thomas, Pope, Haynes, Christie, Frayer-Miller, Matheson and Oldsmobile. There will probably be three Thomas cars, perhaps three Pope-Toledos and also three Loziers. Of course, the Ford racer will be the product of Henry Ford, and much is expected of the six-cylinder that he will bring forth. Robert Jardine again will be the designer of the Royal Tourist candidate, and Louis P. Mooers is to be the architect of the Moon racer. Mooers is well remembered as the builder of a Peerless car for the Irish Gordon-Bennett and also as the designer of the Peerless *Green Dragon* driven by Oldfield. It is understood that the Dragon and Wayne may be participants in the Elimination contest.

RUSSIA WILL HAVE FIRST AUTO SHOW.

Up to the present Russia has remained an almost entire stranger to the automobile. It would appear, however, that this state of affairs will soon be changed and that the land of the Czars may become an important field for the automobile manufacturer. The Automobile Club of Russia is organizing an automobile show in the Michel Hall at St. Petersburg, to be held from the 1st to the 17th of June next, under the presidency of the Grand Duke Michel Alexandrovitch, brother of the Emperor. Naturally, the organizing committee writes in the most glowing terms of the possibilities of the automobile in their country. The large towns such as St. Petersburg and Moscow cover a very large area. During the five months of winter horse traffic over ice and snow is very difficult, while automobiles travel about with perfect ease. On the commencement of the summer season the wealthy inhabitants of St. Petersburg remove to the islands a few miles from the city, to Peterhof, Tsarkoie-Selo, or other summer stations within a forty-mile radius, traveling into the capital every day. Locomotion is of a very rudimentary nature and the automobile would here play an important rôle. The popular idea that Russia is not provided with roads is a myth. It is certainly not so favored as France in this respect, but her highways are equal to those of the Eastern States of this country.

TAXIMETER ENTERPRISE IS CHRISTENED.

C. W. Kelsey, who is responsible for the idea of introducing the Parisian taximeter cabs to New York's streets, has just made public the name of the new concern, which will be called the American Cab and Express Company. While New York will be its headquarters, efforts will not be confined to this city, but a similar service inaugurated in other large centers, such as Philadelphia, Boston, and other large cities. Mr. Kelsey stated that the facilities of the new company will greatly exceed those at present available in Paris, where there are about 1,000 cabs on the streets. An effort will be made to do away with the overcharge and tip nuisance now so universally practised by cab drivers, a notice to the effect that the "motormen"—this is to be their title—are not permitted to accept fees, being posted inside the cab. These motormen will all be graduates of a school to be maintained at the factory. They will be thorough mechanics and capable of making all road repairs. The machines will be equipped with pneumatic tires on removable rims and a spare inflated tire will always be carried, obviating loss of time in making replacements or expense from running on flat tires.

SAD END OF A WELL-KNOWN TRADESMAN.

Leonidas Preston, for some years a salesman for the Timken Roller Bearing Axle Company, of Canton, O., and later general manager of a New York corporation of the same name, and vice-president of the Hewitt Motor Company, of this city, committed suicide on Thursday last by taking poison when about to be confronted by his business associates, William T. Timken of Canton, president of the concern bearing his name, Leonard Gray, treasurer of the same company, and Edward Hewitt, of the Hewitt Motor Company, who called upon him for an accounting. His business affairs were found to be badly tangled and he was personally heavily involved in debt, said to have grown out of a passion for betting. He was a native of Dallas, Tex., where he was born forty-six years ago, and had been identified with the automobile industry for several years through his connection with the Timken company.

THE A. S. M. E. TO MEET ON MARCH 21.

The American Society of Mechanical Engineers will hold its next meeting in the large auditorium in the society's building at 29 West Thirty-ninth street, New York City, Thursday evening, March 21. John W. Lied, Jr., vice-president of the society, will deliver a lecture on Vesuvius and Pompeii, which will be interestingly illustrated by a series of slides from photographs.

THE LEGISLATIVE BOARD OF THE A. A. A. IS NAMED.

THE personnel of the Legislative Board of the American Automobile Association is announced by President W. H. Hotchkiss. It will be noticed that on the board are included representatives of the automobile manufacturing associations including Chairman Terry, counsel of the National Association of Automobile Manufacturers, it being the belief of the executive officers of the A. A. A. that such associations and the national body of motorists can best work together, both to secure and to prevent prejudiced legislation.

Chairman Terry will shortly call a meeting of the board in New York City. At such meeting the bill recently prepared by him and introduced by Congressman Cocks will be discussed, as will also a proposition looking to the drafting of a model State motor vehicle law for submission to the State Legislatures next year. At such meeting the condition of legislation in the various States will be taken up and actively canvassed.

The legislative board is made up largely of lawyers, and, while properly not so large as the Touring Board, is quite representative of the States where the automobile is at present largely used. Its work will undoubtedly be subdivided, and, as in the case of the Touring Board, put in charge of an executive committee small in number, but thoroughly representative of the different sections of the country.

The 1907 A. A. A. Legislative Board.

Chairman, Charles Thaddeus Terry, 100 Broadway, New York City.

W. W. Niles, New York.
Sidney S. Gorham, Chicago, Ill.
Francis A. Hurlbut, Jr., Boston, Mass.
James T. Drought, Milwaukee, Wis.

Roy F. Britton, St. Louis, Mo.
M. Felton Hatcher, Macon, Ga.
Osborne I. Yellott, Baltimore, Md.
J. Jerome Hahn, Providence, R. I.
Wade Cushing, Cincinnati, O.
Robert Brown, Indianapolis, Ind.
J. B. Parkinson, Daytona, Fla.
William McL. Faysoux, New Orleans, La.
Robert Lee Morrell, New York.
D. F. Gay, Worcester, Mass.
Walter S. Schutz, Hartford, Conn.
G. Allen Hancock, Los Angeles, Cal.
James E. Cooper, New Britain, Conn.
John L. Griggs, Paterson, N. J.
Dr. F. L. Bartlett, Denver, Colo.
D. M. Ferry, Jr., Detroit, Mich.
C. C. LaForgee, Decatur, Ill.
Reuel Small, Washington, D. C.
Alexander Schwalback, Brooklyn, N. Y.
G. Douglas Bartlett, Philadelphia, Pa.
Homer H. Johnson, Cleveland, O.
F. D. Larrabee, Minneapolis, Minn.
E. W. Seeds, Columbus, O.
E. J. Kent, Pittsburg, Pa.
William H. Spear, Jersey City, N. J.
W. K. Bracken, Bloomington, Ill.
Arthur J. Plummer, Malden, Mass.
Charles H. Burras, Chicago, Ill.
D. Emmet Welch, Grand Rapids, Mich.
Carlton Godfrey, Atlantic City, N. J.
John H. Barhite, Rochester, N. Y.
William Walker Smith, Cincinnati, O.
H. H. Myers, Duluth, Minn.
George H. Wilson, Louisville, Ky.
George C. John, St. Louis, Mo. (representing American Motor Car Manufacturing Association, New York).
Giles H. Stilwell, Syracuse, N. Y. (representing Association of Licensed Automobile Manufacturers, New York).

MAKE UP OF THE A. A. A. GOOD ROADS BOARD IS COMPLETED

PRESIDENT HOTCHKISS, of the American Automobile Association, on Tuesday announced the full membership of the Good Roads Board for 1907, as follows:

Chairman, Robert P. Hooper, 509 Arch street, Philadelphia.
John Farson, Chicago, Ill.
Augustus Post, New York City, N. Y.
W. P. Murray, Cleveland, O.
E. Kneeland, Pittsburg, Pa.
William T. White, Trenton, N. J.
H. H. Trice, Norfolk, Va.
C. Gordon Neff, Cincinnati, O.
John M. Satterfield, Buffalo, N. Y.
Frank X. Mudd, Chicago, Ill.
W. R. B. Whittier, Atlanta, Ga.
W. H. Chase, Leominster, Mass.
Henry G. Strong, Rochester, N. Y.
Arthur Stein, Cincinnati, O.
Walter E. Edge, Atlantic City, N. J.
R. A. Whitney, Peoria, Ill.
William Neff, Columbus, O.
B. Clinton Slagle, Baltimore, Md.
F. A. Burrell, New York.
Joseph H. Wood, Orange, N. J.
A. E. Demange, Bloomington, Ill.
Daniel P. Ray, Olean, N. Y.
G. K. Wheeler, Kansas City, Mo.
S. W. Kent Miller, Hagerstown, Md.
George H. West, Detroit, Mich.
Palmer Abbott, New Orleans, La.
George M. Palmer, Mankato, Minn.
C. Roy McCanna, Burlington, Wis.
A. G. Widmer, Seymour, Ia.
Ben Wellie, Paducah, Ky.
Dr. F. L. Bartlett, Denver, Col.
A. J. Smith, Los Angeles, Cal.

Chairman Hooper expects shortly to call a meeting of the board for the purpose of sub-dividing its work.

The board will also doubtless take up a question at present much discussed by autoists, that is, whether they and their associations should not from this time take an open position instead of a covert one as to the good roads movement in the various States. It has often been said that owing to the early antagonism between the motorist and the farmer, the two classes of the community most interested in good roads, more would be accomplished by leaving these movements to Grange organization and legislators representing rural communities. Of late, however, it has been thought that a more open advocacy by motorists would be both wise and profitable. Chairman Hooper will present this question, and on its determination will, perhaps, depend the attitude not merely of the A. A. A., but also of its affiliated State associations and clubs in present day movements looking toward good roads.

Another subject which will be discussed will be the best ways and means to accomplish federal aid toward the improvement of at least the trunk roads in the various States.

Chairman Hooper has been named by the Governor of Pennsylvania as one of the representatives of that State at the Fourth Annual Convention of the American Road Makers' Association, at Pittsburg, this week.

An admixture of from 20 to 30 per cent. of glycerine is commonly added to the circulating water of an automobile to prevent it freezing. An automobilist, writing to *Omnia*, declares that he has obtained an excellent anti-freezing solution by the addition of about the same proportion of molasses to the water. The cost is less than glycerine and the effect somewhat better, according to the results of the experiments made.

MAKING PLANS FOR A. A. TOUR.

Chairman F. B. Hower of the A. A. A. Touring Board is confident that the annual tour for the Glidden and other trophies will be a successful event which will do much good to the general cause of automobiling. The board's executive committee will have a session to-day at Buffalo and much will be accomplished towards plans for the tour.



CHAIRMAN F. B. HOWER.

Despite the action of the N. A. A. M. executive committee in passing a resolution which could only be construed as meaning that its members should not support a strenuous competition for the Glidden trophy, there is reason to believe that the manufacturers belonging to this body will supply a goodly number of entries. The A. M. C. M. A. comes forward with the announcement that it will support the A. A. A. tour. One of its members, the maker of the Dragon, states that he will enter four cars.

Present indications point to an endurance tour starting in some Middle West city, a Sunday stop-over in Chicago, and a finish in New York City. From Boston comes the reports that the trade and clubs are not particularly interested in the tour starting from that city. A ten-day tour of 150 miles or more per day, with the Glidden trophy going to the club which supplies the greatest proportionate number of survivors in case of a tie, is what seems to meet with some general approval.

BIANCHI OWEN INTERVIEWED IN PARIS.

PARIS, March 4.—An American automobile agent who is very Italian in his preferences at present is Percy Owen, of New York, who has been in Paris a few days after a visit to Italy, and who, accompanied by Mrs. Owen, is returning to New York by the *Kaiser Wilhelm II*. Signor Owen has just come from Milan, where he devoted some time to an inspection of the Bianchi automobile factory, and he is convinced that the Bianchi is the best machine in the world. He admits that he may be slightly prejudiced in favor of the Bianchi, of which he is American agent.



"SIGNOR" PERCY OWEN.

"In America," he remarked, "nearly all Italians are just plain dagoes in our estimate of them, but I wish more of my countrymen would go to Italy and make the acquaintance of a few self-made aristocrats, like Signor Bianchi, for instance, who began twenty years ago with a hand lathe, making bicycles, and now has the finest automobile factory I ever saw. When we first heard of the Italians making automobiles we were incredulous, inclined to smile, but the truth of the matter is that the Italians are making far better automobiles than the Americans and also better than the French."

Signor Owen seems inclined to accord the term "first-class" to only one American make, and this one begins with a P. As there are several in the United States that correspond to this initial, none of the manufacturers of "P" automobiles can take offense, and all can be flattered. The qualification of "first-class," however, is used only in a comparative sense, as among the domestic products. Signor Owen was the guest at a banquet given before he sailed. Notabilities of local auto circles were present.

PARIS EDITOR ON THAT "INVASION."

PARIS, March 6.—Really, the Americans hesitate at nothing. We knew it already, but they have just given us another proof of it. They noticed that Europe, and especially France, sold them a large number of automobiles, and as they have never been able to enter any open contest, either race or competition, without receiving the most formidable slogging you can imagine, they have organized a monster contest reserved to American cars.

Well, you will say, there is nothing very stupid in that; and in what corner of America will the contest be held?

None at all; it will be in France.

What! in France? Sure. In France.

Well, if you want cheek, that is cheek. It is bad to invite yourself to dinner without informing the master of the house, but to spread abroad the invitation and not ask the host to sit down at the table is still worse.

It is Georges Prade, the fiery editor of *Les Sports*, an important Parisian journal, who, like his historic compatriot Cambonne, has allowed his feelings to get the better of him. Unlike that brave scold, however, he does not employ one word, but five columns of the first page of his journal to denounce those wicked Yankees who are daring to take part in the European tour.

The regulation and preliminary circulars regarding the tour are given in full, with numerous comments, many of them amusing, on the salient features of the project. Thus: "You see that Paris is the only town in which they will stay several days; their desire is to capture our trade and influence the public." E. R. Thomas is designated in a footnote as "the man who entices away French foremen; this time he is working at home." "The author of the scheme, after avowing its commercial object, will ask for prizes from the heads of the countries whose trade he wishes to conquer," comments the French journalist. "There is only one thing more to be done, and that is for the President of the Republic to invite the members of the caravan to dinner and wish them good luck in their efforts to capture French trade and ruin French workmen." The table of penalty points for changes of parts en route draws forth the remark that the "organizer understands American machines; he has made provision for changing everything; what matter so long as they get through."

"To take a French automobile into America 45 per cent. of its value has to be paid in custom duties, or 7,200 francs, for a medium car; if the machine is American it costs but 625 francs to bring it into France. The Americans invite the heads of the States and of the automobile clubs to witness their caravan. We invite them not to witness it, but to forbid it. We have never boycotted American machines and our races have always been open to foreigners. But to allow a contest on our roads, in our cities, before our customers, in which our machines are boycotted, with the avowed object of capturing our trade, that is not hospitality; it is idiocy."

Coming to the attack later, Prade says: "Three times we have gone to New York, and three times we have won the Vanderbilt Cup, but we never asked the Americans not to compete. Let them take part in our Grand Prix and we will lick them; let them take part in our competitions and we will lick them again; but it will be difficult to beat them in a contest, even in France, in which we are kept out."

L'Auto, a rival journal and the semi-official organ of the A. C. F., sees no reason for fear. "Why should not the Yankees have a pleasant excursion in France, drink cocktails in our country and leave their bank notes behind? If they want to capture our trade they will not wait until a Frenchman takes them on an excursion in France; they would have agents here, machines on view; they would advertise. But they don't do that, and the reason is that they are not ready. So long as they are producing their present horrors there is no cause for fear." *Les Sports* turned red with rage at this flippancy and war is now declared between the rival journals.

PROMINENT FIGURES OF THE AUTO TRADE.

R. HARRY CRONINGER, who has just taken the position of sales manager and will also have in hand the general management of the Pennsylvania Auto Motor Company at Bryn Mawr, Pa., was practically responsible for the formation of the Dayton Motor Car Company, the Ohio concern which makes the Stoddard-Dayton car, the success of which is well known. Mr. Croninger's new place will carry with it added responsibility. The Pennsylvania company is a corporation of \$200,000 paid-in capital, and its car sells for \$2,750. The company was started by Charles J. McIlvaine, Jr., of Philadelphia, a man with great confidence in the future of the automobile industry. Mr. Croninger is one of the veterans of the trade, having been formerly connected with the bicycle manufacturing industry, and, like many of its leading men, was early impressed with the possibilities and future of the automobile.



C. ARTHUR BENJAMIN, the new general manager of the Aero-car Company, also carrying the title of vice-president, is one of the pioneers of the industry. "Ben" first sold steam cars, later he became an air-cooled advocate, then next studied the more leisurely electric field, and now returns to his air-cooled proclivities. Once registering from Syracuse, later subscribing himself as from Buffalo, he now places Detroit, Mich., after his name. That smile of Benjamin's is known throughout the land, for he has sold automobiles in practically every State, and in the years gone by the thousands of good bicycles which he disposed of made him an acceptable caller when he went over more or less of his old route for the motor-driven vehicle.



JOHN G. PERRIN, the designer of the Lozier car, who is largely responsible for its originality in design and construction, is of the younger school of automobile engineers who combine a practical experience and motoring knowledge with a thorough technical education. He graduated in the technical course of the Toledo High School in 1893 and entered the shops of the Lozier company at Toledo, O., when this company was constructing bicycles, worked through all the departments, and in 1894 was detailed to superintend special work done in a temporary plant installed at Hartford during the erection of new branch works at Thompsonville, Conn. After this factory was erected, Mr. Perrin was given the position of assistant superintendent, which position he held for over two years, and in 1896 returned to the Toledo plant to superintend experimental work on small motor vehicles. From this time forward all the experimental work and designing on automobiles and marine engines was carried on by Mr. Perrin, and the Lozier steam carriage of 1897 was one of his developments. But he soon realized the position the gasoline car was destined to fill and turned his attention to it.



FIRE CHIEF BRODERICK OF DETROIT IN A WAYNE.
The chief utilizes the Wayne car in his departmental work of inspection, etc.

AUTOMOBILE EXPORTS CONTINUE TO SOAR.

For the month of January, 1907, the total value of automobiles and parts exported reached the sum of \$376,467, as compared with \$297,694 for the corresponding month of 1906. Of the former sum, \$311,242 represented the value of 214 complete cars, and \$65,225 worth of parts, the proportionate growth in these items not being evident, as the value of the parts was not stated separately prior to July 1, 1906. As usual, the largest single item is that of the United Kingdom, amounting to \$114,191, while the smallest, considering the automobile manufacturing nations, is Germany, with but \$4,806. For the period of seven months ending January, 1906, the total amount exported was \$1,438,000, as compared with a value of \$2,429,543 for the corresponding period ending with January of the present year. The latter was composed of the sum of \$2,103,556, representing 1,369 complete cars and \$325,993 worth of parts. The table for January follows:

	1906.	1907.
Automobiles, and parts of.....	297,694	376,467
Automobiles.....No.	.....	214
Parts of.....	.....	155
Exported to—		
United Kingdom.....	114,991	66,698
France.....	16,369	26,380
Germany.....	4,806	9,171
Italy.....	20,005	41,070
Other Europe.....	4,448	10,082
British North America.....	22,107	37,638
Mexico.....	30,985	55,982
West Indies and Bermuda.....	40,461	35,975
South America.....	3,588	28,839
British East Indies.....	4,147	4,673
British Australasia.....	32,669	53,157
Other Asia and Oceania.....	2,000	9,713
Africa.....	1,168	819
Other countries.....	.....	1,320
Total.....	\$297,694	\$376,467



FIRE CHIEF OF CHILLICOTHE IN HIS LOGAN SEMI-RACER.

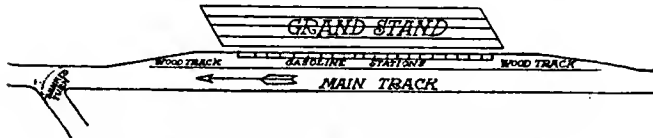
LATEST GRAND PRIX DEVELOPMENTS

490 P

PARIS, March 4.—A question which always arises a few months before the date fixed for an important European race is how the competing machines will be started. French competitors are already asking this question regarding the Grand Prix. An answer can, of course, only be given by the racing board, and it is not safe to prophesy what their decision will be. The Dieppe circuit is only about 47 1-2 miles round and not 50 as was at first supposed. There will be 34 starters in the Grand Prix and nine in the Sporting Commission Cup, to be run at the same time, making a total of 43 cars. The minimum time possible between the start of big racing machines is one minute. A shorter interval

what they need from the stations to be built or thus leaving the main track free for passing at the It is on this side track that the Sporting Commission racers would be started.

Actual work on the circuit has not yet been begun, though the preliminary arrangements are being pushed forward. The racing board has rented a big plot of land three miles from Dieppe, on the sea leg of the course, at a spot known as Pollet. It is here that the grandstands and gasoline stations will be erected. The former will be on the seaward side of the road and will give a view of the racers running at full speed for seven miles. About four hundred yards beyond the stands is the sharp forked turn leading to the second leg of the course. It has been decided not to use this turn, but to unite the two legs by a specially constructed wide racing track built of wood, and equal to the best banked-up motorcycle tracks. Also on the coast leg of the circuit, and within easy distance of the sea, will be erected a huge camp where, for five dollars, visitors may obtain a camp bed, an evening meal and early breakfast.



PROPOSED PLAN OF SIDE TRACK IN FRONT OF GRAND STAND.

is impractical, while if a two-minute interval were adopted the first cars would be round to the starting point before the last machine had been sent off. At 6 o'clock on the morning of July 2, the first machine, a 3.3 gallon racer, will be sent away. At nine minutes past six the first Grand Prix racer will take its flight, to be followed at intervals of one minute by its companions, the last one going over the line at 6:42. Supposing that the first Grand Prix machine covers the course at the rate of 74 miles an hour, and a higher speed is not to be expected, it will be at the starting line again in 38 minutes, or at 6:47—five minutes after the departure of the last machine.

An alternative method is to start the Grand Prix racers first at 6 o'clock, at intervals of one minute, and to send away the nine Sporting Commission racers about two hours later, at intervals of two or three minutes. As the smaller racers have only to cover 310 miles, compared with 500 for the Grand Prix competitors, they would finish about the same time.

The grandstands are on the right-hand side of the road. About fifty yards before reaching them will be built a wooden side track running parallel with the course the entire length of the stands and joining the course again about fifty yards beyond the end of the stands. Machines not needing anything from the station will pass the stands at full speed on the main road. Those needing gasoline, tires, water, etc., will run on the side track and take

Grand Prix drivers have already made their appearance on the course. A few days ago Garcet ran round the circuit a few times with a 120-horsepower Bayard-Clément racer of last year's model. It is expected that some of the new machines will be on the course in a few weeks. The report that many of the racers will be last year's machines slightly modified is absolutely incorrect. In nearly every case entirely new machines will be built. Most firms, indeed, have disposed of their last year racers and are obliged to build new ones. The three Darracq flyers will closely resemble those of last year, horsepower will be 100, and the weight will remain about the same; only detail changes will be made. Bayard-Clément will construct three four-cylinder motors and will not employ the six-cylinder racers constructed last fall. The new machines will have separate cylinders, 160 bore and 160 stroke, developing 120 horsepower at 1,200 revolutions, shaft drive, and will be built rather lower than last year. It is estimated that the fuel consumption will be 5.3-4 gallons per 100 kilometers. Motobloc has under construction five racers of 170 mm. bore by 150 stroke, developing about 120 horsepower. Announcement has been made by the Belgian factory building the three Germain machines for the Grand Prix that their racers will not develop more than 80 horsepower, and will weigh about 1,200 pounds. It will be interesting to watch them against machines of nearly double this weight and power.

TARGA FLORIO ENTRIES NUMBER FORTY-THREE

PALERMO, March 1.—Italy will open the European racing season in a worthy manner with the Targa Florio race on the island of Sicily on April 21. The engagement list has just closed with a total of 43 machines, made up as follows: Italy, 4 Fiat, 4 Itala, 3 Deluca-Daimler, 4 Isotta-Fraschini, 3 Junior, 2 Diatto-Clément; France, 2 Lorraine-Dietrich, 2 Darracq, 2 Berliet, 3 Bayard-Clément, 3 Gobron, 2 Radia, 1 C. V. R.; Germany, 3 Benz, 1 Opel; Switzerland, 2 Lucia, 2 Digne. The machines will be driven by Europe's most skilled drivers, among them being Wagner and Hanriot for Darracq, and Albert Clément, Garcet and Collinet for the Bayard-Clément factory.

The Targa Florio is being run on the island of Sicily owing to the impossibility of obtaining a guarded course on the main land. Italy's war authorities last year refused to aid automobilists by loaning troops to guard the course, and in consequence seriously compromised the race season. The same policy is being pursued this year, but the difficulty is avoided by going to the picturesque island. Largely owing to the influence and liberality

of Chevalier Florio, all competing machines, together with their drivers and mechanics, are shipped free from Marseilles, Genoa, or Naples to Palermo. The prize list provides \$3,000 in cash for the winner, \$1,600 for the second, \$800 for the third, \$400 for the fourth, and \$200 for the fifth. In addition the winner will become possessor of the Targa, and every driver finishing the race will be presented with a reproduction of the cup as a souvenir. The event is a 282 miles speed contest over a 94 miles circuit of extremely varied nature. Hills are sufficiently formidable to test the climbing power of the machines as well as their brake power on the descents, a few straight stretches will allow of high speed sprints, and sharp turns will test the skill of the drivers. The regulations are simple, limiting the four-cylinder machines to a bore between 120 and 130 mm., with a weight limit of 2,200 pounds for the minimum bore; for six-cylinder motors the weight allowance is also 2,200 pounds for an 85 mm. bore, with an increase of 88 pounds for every additional millimeter bore. Last year the Targa Florio was won by Cagno with an Itala.

PACKARD WINS CALIFORNIA CLIMB.

By FREDERICK PABST.

LOS ANGELES, CAL., March 2.—The banner crowd in the history of automobiling on the Coast witnessed the second annual hill climb to-day up the mile and four-tenths grade from Pasadena to Altadena. It is estimated that 10,000 people were gathered along the road, and from the start to the finish autos were crowded under the cypress trees and palms which lined the course. Fully 500 cars took parties from Los Angeles and Pasadena for the climb. It was an ideal California day. The sun shone with all the springtime warmth, and with pretty California maidens in their summerish togs perched on the back of the tonneau seats cheering the dashing automobiles, the sight was one of which Southern California could well feel proud.

The perpetual challenge trophy, won last year by a Thomas, went to Earl Anthony's Packard runabout, driven by Bert Latham. This was the last car to run the course, and from the start, as it swept up the grade between the lines of cheering spectators, it could be seen that it was making the fastest time.

When the winning Packard crossed the car tracks a serious accident was barely averted. At this point the car was going fully forty miles an hour, and as the crossing was struck the auto seemed to leap into the air three feet. People below the spot say daylight could be seen under all four wheels. The wheels did not hit the road straight, and at the great speed it was making Driver Latham had difficulty avoiding a collision with a number of machines lining the course.

The touring car honors went to the Pope Hartford. Bert Dingley, at the wheel of the Pope, drove a beautiful race. He swung around the first turn at forty miles an hour, and sent a great cloud of dust into the air. Faster and faster the car went as it got straightened away. Approaching the car track crossing Dingley saw the immense crowd gathered there closed in, barely leaving enough room for the car to pass. It was his intention to swing to one side and take the crossing at an angle, instead of going straight, and seeing the crowd was in the way he rose in his seat behind the wheel when about 75 yards away and motioned frantically for the people to get back. There was

a rush as the crowding spectators realized Bert's intention, and as he swung across he did not miss the scurrying people by more than a few inches. The summary:

First Event—Runabouts, \$1,000 and Under.

Maxwell, 14 h.p.; Maxwell-Briscoe-Willcox Co.....3:03
 Mitchell, 20 h.p.; P. H. Greer****

Second Event—Touring Cars, \$1,500 and Under.

Tourist, 20 h.p.; Auto Vehicle Co.....2:55 4-5
 Mason, 20 h.p.; Lord Motor Co.....3:04 3-5
 Reo, 20 h.p.; Leon T. Shettler.....3:05 3-5

Third Event—Runabouts, \$1,500 and Under.

Tourist, 20 h.p.; Auto Vehicle Co.....2:40
 Reo, 20 h.p.; L. T. Shettler.....2:51
 Bulck, 22 h.p.; Western M. C. Co.....4:05

Fourth Event—Touring Cars, \$1,501 to \$2,000.

Mitchell, 35 h.p.; Greer Robbins Co.....3:24 1-5
 Pullman, 20-25 h.p.; H. A. Stone.....4:09 2-5

Fifth Event—Runabouts, \$1,501 to \$2,000.

Franklin, 12 h.p.; Ralph Hamlin.....3:25 1-5
 Elmore, 25 h.p.; A. J. Smith.....3:58 4-5
 Mora Car, 24 h.p.; J. F. McNaughton.....4:32 4-5

Sixth Event—Touring Cars, \$2,001 to \$2,500.

Rambler, 40 h.p.; W. K. Cowan.....2:49
 Tourist, 35 h.p.; Auto Vehicle Co.....3:00 4-5
 Elmore, 25 h.p.; A. J. Smith.....3:18 3-5
 Dorris, 30 h.p.; A. C. Stewart.....3:20 3-5
 Knox, 30 h.p.; P. Billington.....3:24 4-5

Seventh Event—Runabouts, \$2,001 to \$2,500.

Stoddard-Dayton, 35 h.p.; V. Peyton.....2:31
 Tourist, 40 h.p.; Auto Vehicle Co.....3:02 1-5

Eighth Event—Touring Cars, \$2,501 to \$3,000.

Pope-Hartford, 30 h.p.; White Garage.....2:33 2-5
 Maxwell, 40 h.p.; M. B. W. Co.....2:56 1-5
 Franklin, 20 h.p.; Ralph Hamlin.....3:24 1-5

Tenth Event—Touring Cars, \$3,001 to \$4,000.

Knox, 35 h.p.; P. Billington; \$4,000.....3:44 2-5

Twelfth Event—Roadsters, Free For All.

Packard, 30 h.p.; Earle Anthony; \$4,200.....2:14 4-5
 American, 40 h.p.; So. Cal. Motor Co.; \$3,250.....****

COMING OF THE EIGHT-CYLINDER ENGINE.

HARRISBURG, PA., March 9.—At a meeting of the Engineers' Club of Central Pennsylvania, held in this city last night, Cecil H. Taylor, of Martin & Co., consulting engineers, made an address on the subject of motor design particularly with reference to the multi-cylindereed motor of the future. The four, six and eight-cylindereed types were dwelt upon at length with reference to their advantages on the score of reliability, durability, maintenance and repair.

"The six-cylinder motor is but a stepping-stone to the eight-cylinder V type for higher powers," said Mr. Taylor on this point. "This latter has all the advantages over the six that the six has over the four, and, in addition, those of low cost, compactness and higher weight efficiency. The eight-cylinder, V type, can be constructed, power for power, for about 75 per cent. of the cost of the six-cylinder. Its shape and size adapts it to being placed upon the chassis more advantageously than the latter without unduly lengthening the car.

"I believe up to 50 horsepower, or say 5½-inch bore, that the four-cylinder motor will hold its own, but that beyond this power the eight-cylinder, V type, will drive the six from the field. This would mean that the eight-cylinder would begin at about 4-inch bore, giving about 50 horsepower, above which the eight-cylinder motor will be the accepted type. There are certain difficulties, notably that of carburetion, which are encountered as the cylinder number is increased beyond four. The six-cylinder motor is not only educating the public, but the constructors as well, to the point where the eight-cylinder idea can be commercially put in practice, which will not be long in coming."

HARDING TO DRIVE AMERICAN MORS CUP CAR.

H. N. Harding, who piloted the English Daimler in all its races last year, and drove the winning Haynes racer in the Vanderbilt Cup trial last fall, is the latest acquisition of the American Mors forces. Mr. Harding says that he believes the 40-52-horsepower American Mors to be not only the fastest stock touring car built in America to-day, but also, owing to its foreign materials and the extreme care in construction and inspection of detail, better able to sustain the strain of hard usage than any other American car. Mr. Harding is now at the factory, familiarizing himself with the various models and trying out new cars. No special racing car will be built, but it is planned to enter regular stock models in all open events during the coming season. Designs are nearing completion for the six-cylinder, 120-horsepower American Mors racer to be entered in the Vanderbilt Cup trial this fall.

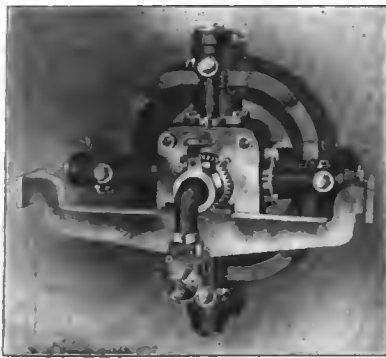
NEW YORK PRISON TO FURNISH SIGNBOARDS.

ALBANY, March 11.—The construction of good roads and the use of automobiles have largely increased highway travel, so that the need of signboards at the intersection of highways to guide travelers is much greater than it was. Many States, and especially those of New England, have erected signboards in recent years, but the highway authorities in New York State have done little in this direction. In order that all localities in this State may be furnished with substantial signboards, Superintendent of State Prisons Collins has arranged to furnish them from Clinton prison.

AN INGENUOUSLY DESIGNED NEWCOMER

QUITE the most radical and interesting departure from current practice that was revealed at the Hub show is the Bailey runabout. This is its title in brief and it is officially known as Model B, but its full name is somewhat more descriptive of its distinguishing features. It is the Bailey revolving four-cylinder, two-cycle runabout, and for the present its builders, the recently incorporated Bailey Automobile Company, Springfield, Mass., will devote their entire attention to this type of vehicle, adding a touring car and also a commercial vehicle later, the motor taking up such a small amount of space that it is particularly adapted to the needs of the latter. The motor is the result of several years' patient labor, each step in the detail of its design having been worked out at a time until its designer was certain of it, and the result has been such as to surprise even those who have hoped most for the outcome.

Design of Motor.—As already mentioned, the chief distinguishing characteristic of the Bailey motor is the fact that it is of the revolving type, having four cylinders placed on the diameters of a circle at right angles to each other. But it has others that add to its interesting features, not the least of which is the employment of the two-cycle type of operation, and this combined with air-cooling makes it one of the simplest motors of its horsepower ever built. It will be readily evident that the working out of the design of the motor itself was complicated considerably by the



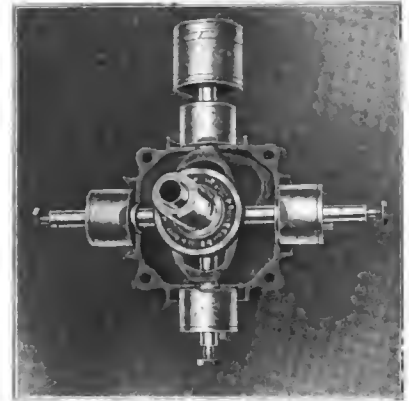
THE REVOLVING UNIT POWER PLANT

necessities of the situation in that suitable mounting presented a more or less difficult problem, and moreover one upon which the successful working of the motor depended to a very large extent. On the other hand, it simplified matters to some extent in that it permitted of easy and efficient air-cooling with a minimum of surface for radiation, and the momentum of the revolving cylinders made the use of a flywheel unnecessary. These two features have combined to make it possible to build a motor weighing but a third of one of the standard type of the same cylinder dimensions. As four explosions are obtained during every revolution and all four pistons are actuated by a single throw crankshaft which is held stationary, an unusually good mechanical and working balance is secured, with the added advantage of entirely eliminating vibration.

The crankshaft is hollow and the carbureter is attached to the end of it, the charge passing through the shaft and out through a universal cone valve to the various cylinders, all of which radiate from a common central crankcase. As the piston of a cylinder travels toward the head of the latter, a charge is drawn from the carbureter and through the valve in the crankshaft. Having finished its suction stroke, the piston closes the suction port, cutting off the supply, and the fresh charge is held in the base of the cylinder. On the down stroke of the piston the gas is forced up through a transfer passage and a balanced poppet valve into the combustion chamber on the other side of the piston, being there compressed and fired by the next upward stroke. The exhaust escapes through ports on each side of the cylinder uncovered by the piston in its descent and the same moment a fresh charge of gas is entering the same cylinder through the poppet valve in the head so that there is no possibility of mixing the spent and incoming charges.

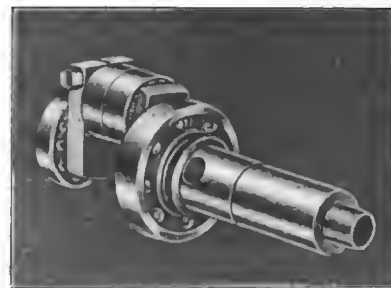
Motor Details.—The crankshaft, the extreme shortness of which is noticeable in the illustration, is machined directly from chrome-nickel forgings and ground to exact size. It is held stationary by a steel casting resting on the cross member of the frame and also forms a support for one side of the motor. The other end rests on a large Hess-Bright ball bearing.

The crankcase is made in two pieces of manganese bronze alloyed especially with a view to obtaining the maximum tensile strength. The case is oil-tight, and, as will be seen from the illustration, the back half forms the rear support for the motor besides serving to transmit the power; it also rests on a large Hess-Bright ball bearing. Two of the latter form the support for the entire motor, while the smaller bearing of the same type held in the back of the case forms the support for the end of the crankshaft. The bearings on the crankpins consist of four rows of special ball bearings, so that there are no bearings in the engine requiring adjustment.



MINUS CYLINDERS AND CRANKCASE.

The cylinders are cast of high-grade, close-grained iron, are ground to exact size and are held on the crankcase by four 5-8 inch nickel-steel bolts having a tensile strength of 75,000 pounds to the square inch. The dimensions are 4 1-2-inch bore by 4-inch stroke and the motor develops 22-24 horsepower at 900 r. p. m. The intake pipe, valve seat and the cooling pins, of which there are comparatively few, are all cast integral with the cylinder, doing away with the necessity for using gaskets or bolts and making a most compact and effective unit. Particular care has also been taken in the selection of the iron for the pistons, which are fitted with two rings near the head and a third close to the bottom, the motor being designed to run on 70 pounds compression. Quite a radical departure from current practice is to be noted in the construction of the connecting rods, the design being known as a Scotch yoke. The pistons are secured directly to the connecting rods by means of a large nut, thus permitting

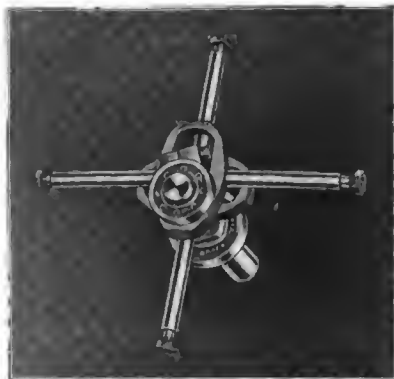


THE BALL BEARING CRANKSHAFT.

of no relative motion between the two and eliminating all side thrust of the piston on the cylinder walls. The inside of the yoke is hardened and ground and rolls on the races of the ball bearings of the crankpin, a ball or rolling surface being provided for every moving part. The use of a muffler is dispensed with by the provision of an annular expansion chamber into which the exhaust escapes. This chamber, of five times the cylinder capacity, revolves with the motor, and by reason of the low temperature at which this serves to maintain it, makes the motor extremely quiet running, as well as eliminating any back pressure. The motor is suspended on two cross members placed 12 inches apart, one of which holds it on a large ball bearing while the other carries the bracket holding the stationary crankshaft. Both its placing and features of design com-

bine to render every part of the motor accessible as none of the mechanism is behind the dash of the car. The starting crank of the motor is geared in the ratio of two to one, thus rendering starting very easy, and such as a woman can readily accomplish.

Lubrication and Ignition.—This is of the positive type, the supply being maintained by means of a force-feed lubricator of the mechanical type. The oil is forced through an aperture in the



ROD AND CRANKSHAFT ASSEMBLY.

crankshaft issuing at the crankpin, where it is first used to lubricate the latter. After leaving this bearing the oil is quickly and thoroughly distributed about the interior walls of the crankcase by means of the centrifugal force developed by the revolution of the motor. This tends to keep it at a point furthest from the center, and here there is an automatic ball check provided which, acting by reason of the same force, permits the oil to flow upon the pistons as soon as the motor begins to revolve, but prevents any from passing while the motor is at rest. Thus the centrifugal force generated by the motor when in operation is caused to act as a pump for the lubricating oil, which it is said to do very efficiently. But for this ingenious device, the cylinder that was downward when the motor stopped would become flooded with oil between the interim of stopping and re-starting the motor. The ignition is of the high-tension type, the spark plugs being placed in the sides of the cylinder near the head, current being supplied by a magneto, gear-driven directly from the motor.

Transmission Details.—The transmission is combined with the rear axle in such a manner that the latter and the engine may be placed in almost the same horizontal plane, thus eliminating the loss customary with universal joints made necessary by the angularity of the propeller shaft. The motor shaft is but 5 1-4 inches above the level of the rear axle, but is so arranged as to permit of the propeller shaft and engine shaft to be in a straight line. One universal joint is provided to take care of the angularity set up by running over rough roads. The change-speed gear is of the positive clutch type, the pinions being of specially treated nickel steel. This type of transmission, the details of which are not given by the makers, is claimed to be unusually quiet running. So much so as to make the car equally easy and smooth running on the low gear as on the direct drive—something that will be appreciated in hilly or mountainous districts. Another great advantage is to be found in its placing on the rear axle where it is installed as unit in combination with the latter. Large inspection plates are provided so that it is readily accessible without the necessity of a pit or the removal of the car body. The housing is oil-tight, and one packing of heavy grease is said to insure perfect lubrication for 1,000 miles running. For use on American roads a car must have ample clearance, and this has been borne in mind in the design of the Bailey, there being 11 inches clear between the road and the lowest part of the mechanism with 32-inch wheels. The differential is of the spur type, using four pairs of steel pinions of 1 3-8-inch face by 8 pitch; these are hardened, bronze bushed and run on 3-4-inch studs. The outer diameter of the differential case is but 8 inches, and it is made oil-tight.

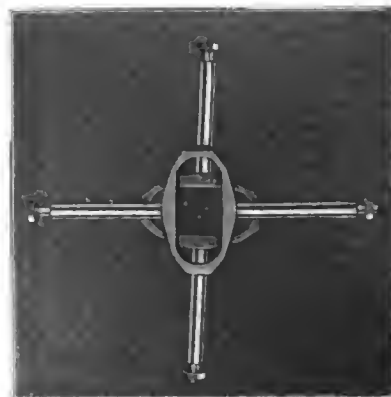
Running Gear and Brakes.—The chassis is mounted on a pressed steel frame of the standard type, while suspension is by means of the usual semi-elliptic

springs in front and full elliptics of patented design in the rear. They are made of high-grade crucible steel, oil-tempered, the forward pair having five leaves each and measuring 1 3-4 by 40 inches, while the full elliptic scroll springs in the rear have four leaves measuring 1 3-4 by 36 inches. Artillery wheels having twelve 1 1-4-inch spokes and measuring 32 by 3 1-2 inches are employed; the rear wheels are made with spottings on each alternate spoke to provide for the brake drum assembly. The two sets of hub brakes provided are on the rear wheels, one of the internal expanding and the other of the external contracting type. They are lined with leather belting, and are extremely powerful, and are normally held out of engagement by mechanical means in order to prevent dragging. They are so designed as to be equally effective whether the car is running forward or backward, thus doing away with the necessity of using a sprag or other back-stop arrangement. The open construction and large diameter of the drums afford an unusual amount of radiating surface, and prevent the lining being burned out when used for severe hill work, which will be appreciated by experienced drivers.

General Details.—The steering gear is of the irreversible type, placed at the right hand side, control being by means

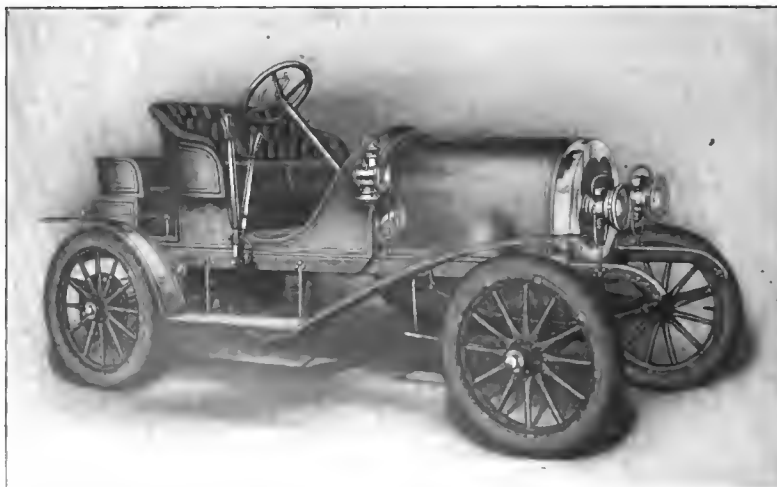
of an independent sector placed over the steering wheel but not revolving with it. The wheelbase is 100 inches and the tread standard, and in full running order the complete car only tips the scales at 1,500 pounds.

With the usual equipment of side and tail lamps, horn and tools, and as a two-seated runabout, the Model B lists at \$2,000, the provision of an extra rumble seat



"SCOTCH YOKE" CONNECTING RODS.

being optional with the purchaser and costing \$50 extra. The gasoline capacity is 12 gallons. Although entirely out of the ordinary run in a great many ways, the power plant of the new Bailey runabout lends itself very well to the needs of the present-day car as favored by the practically universal demand, and as will be evident from the illustration of the completed car, it differs in no way from the standard type so far as outside appearance is concerned. Its design throughout has been the subject of considerable study on the part of its builders and every part has been given a thorough trying out before adoption, so that they have every confidence in its ability not alone to do all that is claimed for it, but a great deal more.



MODEL B 24 HORSEPOWER BAILEY 1907 RUNABOUT.

THE EMPIRE TIRE CO., TRENTON, N. J.

TRENTON, N. J., March 11.—An important addition to the ranks of the automobile tire manufacturers is the Empire Automobile Tire Company, of Trenton, N. J. This company is sanguine of success. It announces its intention to make only the highest grade of goods, and for this class of goods it feels there is ample market.



CROSS SECTION EMPIRE TIRE.

It is the plan of the company, for the present, to make clincher tires only. As shown by the illustration, the Empire tire is made with raised tread. It is produced by the one cure open-steam process, which, it is claimed, produces the best quality, retaining the greatest resilience and strength in the rubber, and preventing all deterioration in the fabric.

The Empire Automobile Tire Company has the financial support of General C. Edward Murray, who is the largest stockholder in

the Empire Rubber Manufacturing Company and the Crescent Belting and Packing Company.

The president of the Empire company is Charles H. Semple, who was secretary and sales manager of the G & J Tire Com-



FACTORY EMPIRE AUTOMOBILE TIRE CO., TRENTON, N. J

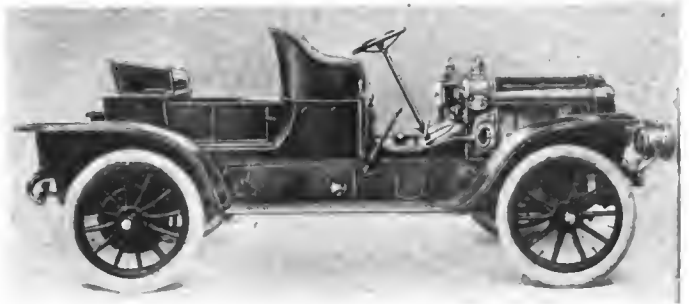
pany from the time that company was organized until he resigned to become identified with the Empire.

A. Boyd Cornell, secretary of the Empire company, has been in the rubber business for many years, having been manager for three years past for the Empire Rubber Manufacturing Company. W. G. Whitlock, who has traveled for the G & J Tire Company for several years, will represent the Empire company as a general salesman.

The Empire company is arranging for a very large output of clincher tires and is also manufacturing a large line of tire sundries.

A WALTHAM COMPANY ANNOUNCEMENT.

The Waltham Manufacturing Company, Waltham, Mass., makes the following announcement concerning prices: "Commencing March 15 the extra list price will be \$100 for two-cylinder 8-horsepower motor equipped to any of the four friction-drive cars, Models BR, ER, ET and DC. Orders placed after that date will be accepted only upon that basis of catalog prices. There will be no change in list prices on 4-horsepower cars. This additional price is made necessary by the enormous increase in the cost of material and labor, together with numerous unexpected changes in construction required for the 8-horsepower motor. The cost of this motor alone, with its many improvements, is more than double the original estimate."



WHITE MODEL G, 30-HORSEPOWER RUNABOUT.

WHITE STEAM RUNABOUTS NOW READY.

It was long thought that steam did not lend itself readily to the design of car considered ideal by the buying public, but the builders of the White Steamers were not long in correcting this impression, and nothing did quite so much to dissipate it as the appearance of the Model G 30-horsepower car, both in the touring and runabout styles. The latter made its debut at the Palace show in New York City, and is now a center of attraction at the Hub's gathering. The White Company announce that deliveries are now being made of this model. The chassis is identical with that of the Model G touring car, except that its wheelbase is but 104 inches, as compared with 114 inches in the former case, and it is also geared for higher speeds. One of its distinguishing features, as compared with other cars of the same class, is the arrangement of a combination sliding and folding door at either side of the rumble seat, which adds not a little to the general business-like appearance of the machine. Back of the rumble seat accommodation is provided for baggage.

A RECORD BREAKING RUN IN THE ROCKIES.

From Loveland to Estes Park, Colorado, is a distance of seventy miles—that is, horizontally. Vertically there is a difference of 2,500 feet between them, the grades averaging 20 to 25 per cent. for long stretches, so that making this trip in a little over three and a half hours would be considered something of a feat even under the most favorable conditions. But on February 1 of this year Palmer M. Richardson of Longmont, Colo., made it in a two-cylinder 18-horsepower Reo touring car in 3:39 against a forty-mile gale of wind, and thereby hangs a record performance. The car carried four passengers and baggage, making a dead load aggregating 700 pounds, despite which the trip was made on a total fuel consumption of 3½ gallons. The wonder of most autoists in that section is how Mr. Richardson ever managed to negotiate the grades at all with so much weight aboard.



MR. RICHARDSON'S REO CLIMBING THE COLORADO ROCKIES.



LINE-UP AT THE START OF THE NEW YORK-BOSTON RUN OF THE DRAGON, WELCH AND WAYNE CARS.

WELCH WINS IN NEW YORK-BOSTON CONTEST.

BOSTON, March 13.—Three cars accomplished the winter journey between New York and Boston in a single day, but the exact distribution of the honors seems undecided at this hour. An Aerocar driven by a Mr. Robbins left New York at 12:30 A.M. Tuesday and reached the Boston show at 8:15 P.M. This car had nothing to do with the endurance contest which involved two Welch cars, a Dragon and a Wayne. This quartet left New York at 4 o'clock and L. R. Perlman reached the show at 10:45 P.M., in one of the Welch cars, though not in the one with which he started. Near Marlboro, Mass., a trolley car struck the Welch, smashed the tonneau, and R. L. Dunn, the well-known correspondent, who was a passenger, had a leg broken. The Dragon, driven by John Haynes, had a lead until near Worcester, when a broken universal joint compelled a long delay until help could be secured and repairs made. The car arrived at the Hotel Lenox at 5 o'clock this morning. Hard luck pursued the other Welch and the Wayne.

NEW MITCHELL FACTORY IN OPERATION.

The Mitchell Motor Car Company, of Racine, Wis., is getting settled down to work in the new concrete addition to the regular plant, which gives extra space of 100 by 230 feet. The new building is equipped with every modern labor-saving device to reduce the cost of handling and transferring to a minimum and

the different machines and devices are the most modern procurable. Notwithstanding this extra space at their disposal, the factory will be taxed to the utmost to execute orders for 1907 cars now on their books. As soon as the frost is out of the ground, still another new building, double the size of the one just completed, will be started and ready for occupancy about August 1. Plans are also being drawn up for a handsome new office building, which will also be ready for occupancy about this time. All buildings are to be fireproof, modern concrete construction.

G. B. Rogers, secretary and sales manager of the Mitchell company, has recently started on a business trip through the East and South to complete arrangements for the season 1908 and to open up with desirable agencies that could not heretofore be considered because factory facilities were inadequate to justify branching out after new trade.

TOLEDO WILL HAVE A SHOW.

TOLEDO, O., March 11.—Not to be outdone by her sister cities, Toledo is arranging to have an automobile show, the first in her history. The dates are March 21, 22 and 23, and the place of holding the show the Coliseum, the largest hall in the city. Local sales agents, garage keepers, manufacturers, and E. E. Fix have agreed upon the general plan to be followed out, and it is assured that a goodly display of machines will be shown. Purple and white are to be the colors of the show.



POPE COMPANY OFFICIALS AUTOING IN SNOW STORM.

Col Albert A. Pope, President, in tonneau, Charles E. Walker, second vice-president, and W. C. Walker, secretary, in front seat of Pope-Hartford Model L.



MAYOR THOMPSON OF DETROIT AND HIS MITCHELL.

This is a remarkably clear flashlight picture taken upon the arrival of the Mayor at the Detroit Automobile Show, which he formally opened.

BRIEF ITEMS OF NEWS AND TRADE MISCELLANY

Secretary F. H. Elliott, of the American Automobile Association, has just bought a Thomas Forty touring model.

The B. L. M. Motor Car & Equipment Company has opened an automobile engineering laboratory in Brooklyn under the management of David Landau. The first four-cylinder manograph ever used in this country has just been received at the laboratory.

The E. R. Thomas Motor Company is just completing a special order for twenty cars, most of which have been shipped, intended for use in and about the Tonopah and Goldfield mining districts. At the present time there are over fifty Thomas cars in use in the two mining camps.

The National Sales Corporation, of New York, has opened a branch at 1436-1438 Michigan avenue, Chicago. This move became necessary owing to the increased line of automobile appliances now handled by the company. F. J. Alvin, for six years with the American Electric Novelty Manufacturing Company, will have charge of the Western branch.

The purchase of a large majority of the stock of the Bryant Steel Wheel and Rim Company, of Columbus, O., by the representatives of the Diamond Rubber Company has given the latter control of the wheel and rim concern. The Marsh rims made by the Bryant company will now be handled by the Diamond Rubber Company as owners, and not as agents.

George E. Risley, the well known salesman of the Electric Vehicle Company, recently addressed the Rivers, Bridges and Roads Committee of the Connecticut Legislature on the advisability of having all vehicles carry a light at night. This measure has the endorsement of all State motorists and indications point to its enactment at an early date.

Enlargements are being made by The Motor Shop, of 317-319 North Broad street, Philadelphia, by the incorporation of the adjoining store at 321. The dividing wall between the old and the new is being pulled down and one large store will be formed. This concern has been handling the Stearns and the Oldsmobile, and recently added the Columbia to its line.

In these days of abundant challenges, Frank Fanning, of the Haynes Automobile Company, says he is willing to let the Haynes record for speed regularity and reliability rest upon the display it made in the last Vanderbilt race. The fact that a stock car was able to make such a wonderful showing against American and foreign autos of double the horsepower, speaks for itself.

Work on the new Winton branch in Pittsburg is progressing so rapidly that the building will undoubtedly be ready for occupancy by April 15. The structure will be one of the largest automobile establishments and the only manufacturer's branch house in Pittsburg. A site for the Winton branch in Detroit will be selected within the next ten days, and the building work will then proceed rapidly.

A marked increase in the use of electric vehicles is observable with increased facilities for charging batteries. The Electric Vehicle Company says that further stimulation has been given by the increased num-

ber of private charging plants, which are found to be not only convenient but economical. One owner of a private plant states that he ran his Columbia victoria-phaeton 3,850 miles at a cost of \$7.50.

Rainier cars will soon be manufactured at the new factory to be located at Saginaw, Michigan. The Rainier Company recently acquired a tract of land consisting of forty-six acres on which factory buildings are now being erected. There will also be a one-mile track for testing cars. Papers have been filed in Albany increasing the stock of the company to one million dollars, but the directors and management remain the same.

The Standard Fire Extinguisher Company, of Cincinnati, O., recently closed a contract with the De Luxe Motor Car Company, of Detroit, to install a sprinkler system in the De Luxe factory, the cost of which goes into many thousands of dollars. Although the original cost of the system is high, it represents, nevertheless, a profitable investment by greatly reducing fire insurance rates as a result of the increased safety element.

The Automobile Auction Company of America, Inc., has leased the building now occupied by Fiss, Doerr & Carroll Company at 41 and 43 West Sixty-third street. It is the intention of the company to hold weekly auction sales of automobiles. E. Favery has been engaged as motor expert and will examine each machine entered for the benefit of prospective buyers. J. Hatfield Morton has been retained as auctioneer of the company. The initial sale will take place the first week in April.

No reply has been received to the challenge of E. R. Thomas to match a Thomas Flyer with a British Rolls-Royce car in a run from New York to Chicago and return. One of the conditions of the test was that stock machines at present in use should be employed. The contest would have proved which were the better machines, American or British. One result, however, for the American industry will probably be that European makers will be more careful in their criticisms of American cars.

In its work toward the formation of the Society of American Motor Engineers, the committee of the American Motor Car Manufacturers' Association calls attention to the fact that the engineers in most of the factories of the Association are not mere salaried men who might flitter from one concern to another for an increase in salary, but are invariably part owners of the factories where their cars are made. In this connection might be mentioned J. D. Maxwell, R. E. Olds, Henry Ford, S. H. Mora, W. H. Van Dervoort, R. B. Crawford, L. P. Mooers, A. J. Pierce, W. Bates, James E. Austin and G. P. Dorris.

Many of the difficulties of constructional detail in automobiles have been due to designers having been influenced by their experience with stationary engines, according to David Ferguson, the Buffalo expert. This is peculiarly true in respect to oiling systems, he says, and the fact that the automobile presents entirely different conditions has been tardily grasped. Ferguson is the inventor of an efficient oiling system that was purchased by the George N. Pierce Company. It is far from being a sight feed, for the whole arrangement is under

the hood, but it works automatically and the flow of oil does not vary when the car is going up hill or down.

To test the relative value of contracting and expanding brakes, H. J. Hass, superintendent of the E. R. Thomas Motor Car Company, recently made experiments with two 1907 model Thomas Flyers. Both were fitted with foot brakes on the rear hubs of the contracting leather to metal type. For the hand lever brakes one was equipped with contracting leather to metal brakes on countershaft drums and the other with expanding metal to metal brakes in the interior of rear hubs. Starting them on a 200-yard hill with a 28 per cent. grade, the car with the metal to metal expanding brakes reached the bottom 54 seconds before the other. Further tests on straightways proved so conclusively that the contracting bands always stop the car more quickly that band brakes on the countershaft were adopted.

"Like a new half-sole to a worn shoe" is the way the makers of the "Xtra-Servis" leather treads take of expressing its value to the autoist who is undecided as to whether to have his worn out tires retreaded in the usual manner or replaced with new casings altogether. These treads are built of a special grade of leather and are secured to the tire mechanically as well as by vulcanizing, the edges being sewed to the underside of the tire lips after they have been brought around under the clinch of the rim so as to prevent rim-cutting and bursting. This is an important feature, as it also prevents the tread from loosening or bunching up at the sides. The surface of the tread is shod with a series of steel traction rivets which are insulated from the rubber by a course of leather, so that they cannot heat or cut the tire. These "Xtra-Servis" treads are readily applicable to any worn tire and are made in the usual standard sizes by the American Tire Company, Owosso, Mich., who also make the well-known Salisbury leather tires, as well as "Protecto," which is an interchangeable leather and steel tread for rubber tires and may be applied or removed in a short time whenever desired.

NEW AGENCIES ESTABLISHED.

In Buffalo, the Centaur Motor Car Company will sell the Autocar.

Sears & Burgess have opened the new St. Louis car agency, 1239 Michigan avenue, Chicago.

The firm of Banker Brothers, of Pittsburg, have taken up the agency for the Aerocar.

The F. E. Boland Motor Company, 239 Halsey street, Newark, N. J., has taken the agency for the American Mors for that city.

The tire products of Torrihon & Cie, of Clermont-Ferrand, France, will be represented in Philadelphia by William Sanford, Jr., & Company at 903 North Broad street.

Ernest Torgler, a member of the insurance firm of Braun & Torgler, of Toledo, O., will shortly open a salesroom and garage for the purpose of handling the Jewell runabout, manufactured at Mansfield, O.

The Warner Instrument Company has opened a New York branch at 1781 Broadway. A. J. Inderrieden will have charge of the branch and M. J. Dolder, formerly with the Michelin Selling Company, has been added to the selling force.

An important change in agencies is announced by the Continental Caoutchouc Company, which has transferred the distribution of Continental tires for Boston and vicinity from the Angier Company to the newly-established Boston store of the Post & Lester Company at 815 Boylston street.

PERSONAL TRADE MENTION.

E. R. Thomas, president of the big factories that build the cars that bear his name, has gone to Florida for a brief respite from business.

H. Y. McMullen has been appointed resident salesman at the Detroit branch of the Pennsylvania Rubber Company, opened on January 1 under the management of O. H. Joy.

A. D. Caldwell, formerly of the G. & J. Tire Company, and latterly with the Pennsylvania Rubber Company, has connected himself with the Atwood Garage, Toledo, O.

W. C. Whitehead, who has been connected with various large manufacturing interests for many years, has succeeded Herman Broesel as president of the Smith & Mabley Manufacturing Company.

George C. John, sales manager of the St. Louis Car Company, and a member of the Legislative Committee of the American Motor Car Manufacturers' Association, has been appointed on the Legislative Board of the American Automobile Association.

A. W. Church, secretary of Wyckoff, Church & Partridge, is satisfactorily recovering from the accident he met with some time ago when thrown from his carriage. Mr. Church has gone South to recuperate and has taken to fishing as a pastime.

Thomas Henderson, vice-president of the Winton Motor Carriage Company, accompanied by Mrs. Henderson, left Cleveland this week on a leisurely trip to the Pacific Coast. Going and returning, Mr. Henderson will visit Winton representatives in the larger cities of the West.

J. B. Bartholomew, president of the Bartholomew Company, makers of Glide automobiles, recently returned from a three months' trip to South America, which he visited to establish agencies for Glide cars, besides attending to some of his other business affairs in Argentine Republic, where he has some vested interests.

RECENT TRADE REMOVALS.

D. W. Romaine, agent for Marion, Queen and Durvea cars, has removed to a two-story fireproof building at 225-7 Mercer street, Jersey City, N. J.

The De Barrès Auto Company, agents for Delahaye and Pilain automobiles, will shortly occupy the handsome showrooms at 1966-8 Broadway, between Sixty-seventh and Sixty-eighth streets, about to be vacated by the C. G. V. Company. The present De Barrès garage at Park avenue and Sixty-third street will be retained and undergo considerable improvements.

RECENT TRADE PUBLICATIONS.

There is an element of assurance about the new books just issued by the National Motor Car Company, of Indianapolis, Ind. It consists of sixty-four pages of letters from National owners in every part of the Union, all testifying to the good qualities of this well-known machine.

"From the Intake" is the title of a neat little booklet that is being circulated by the Aerocar Company, of Detroit. On the cover is a design showing an intake pipe from the big Model F touring car. It is disconnected from the motor and the contents of the book are supposed to be coming from the intake.

APPLIANCE COMPANY FORMED.

Incorporated with a capital of \$125,000, the Willyoung Appliance Company of Yonkers, N. Y., will undertake the manufacture of coils, magnetos, spark plugs, speedometers, odometers, and similar accessories for motor vehicles and motor boats. The president and manager is Elmer G. Willyoung, a man who has had extensive experience in electrical matters. Mr. Willyoung is a floor member of the American Institute of Electric Engineers, and has been president of the electrical section of the Franklin Institute of Philadelphia. He originated the vacuum process of manufacturing coils, devised the apparatus used by the Postal and Western Union Telegraph Companies for testing and locating faults in cables, and for some time was the electrical expert to Queen & Company, of Philadelphia, and to the Franklin Engineering Company. Associated with Mr. Willyoung will be Benjamin Briscoe, J. D. Maxwell, Jerome Bradley, R. A. Paterson and a number of others.

WILL NOT AMALGAMATE.

The Acme Motor Car Company, of Reading, Pa., states that there is no foundation whatever in the report that the Duryea Power Company will be incorporated with that concern. The Acme Motor Car Company is being reorganized, but business has never been stopped.

RECENT INCORPORATIONS.

Bowly Auto-Pneumatic Tire Company, Jersey City; capital, \$100,000. Incorporators: William W. Gooch, James B. Mackey, and Ralph B. Crummy.

Mercantile Motor Car Company, Brooklyn; capital, \$50,000. Directors, C. P. Wormwood, 350 Eighth street; B. L. Lumpkin, and I. H. Smart, Brooklyn.

Rockaway Auto Garage Company, Queens Borough, New York; capital, \$10,000. Directors, A. G. Jennings, C. B. Ebert, and J. T. Curtis, Rockaway Beach.

Franco-American Lamp Company, New York; capital, \$5,000. Directors, Nicholas Leewenstein, 157 West Fifty-fourth street; C. S. Hoffman, New York; Leopold Herzstein, Brooklyn.



TESTING LOGAN CARS ON ONE OF THE PICTURESQUE ROADS NEAR THE FACTORY, CHILLICOTHE, O.

INFORMATION FOR AUTO USERS.

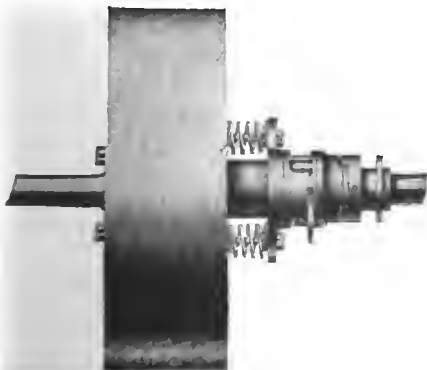
Repairing a Puncture by Old-Time Methods—the kind that proved effective with the bicycle tire, but have fallen so far short of it in the case of its large successor, is a job to try the patience of a saint, particularly when, after all the fussing with patches and cement has been gone through, the patch fails to



"CINCH" TIRE REPAIR KIT.

hold, and the operation must be repeated before many miles have been covered. As an improvement on this process the Auto Goods Company, 60 State street, Boston, Mass., have brought out the "Cinch" tire repair kit, which enables the autoist to make a positive and permanent repair in a fraction of the time required to put on an old-time patch. The complete kit consists of but three tools, a cutter, wire opening tool, and a pair of pliers, in addition to a supply of puncture repairing seals. Inner tubes have been known to give 2,500 miles' service after having been repaired with "cinch" seals.

Hydraulic Oil Clutch.—The Palmbla hydraulic oil clutch has been designed by the North Chicago Machine Company to eliminate the use of speed transmission, except reverse, and give an apparatus with which the car can be run on high gear from one mile per hour to the highest speed of the motor. It consists of a flywheel clutch body bolted to the crankshaft of the motor, taking the place of the flywheel. One and a half to two quarts of oil are poured into the clutch casing through an oil space provided for that purpose. When power is applied to the foot lever a

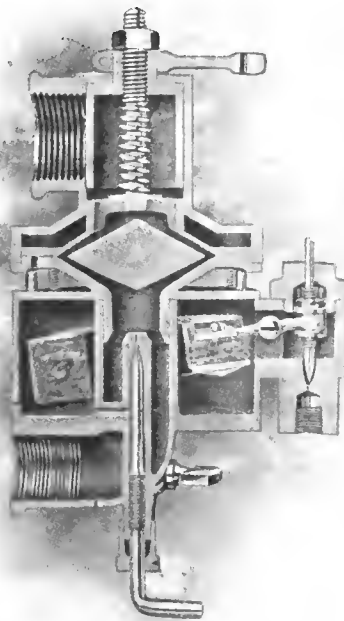


PALMBLA HYDRAULIC OIL CLUTCH.

couple of wedge shaped rings move in opposite directions and force a flange ring inwardly. This acts upon two studs, an auxiliary ring and a cone ring, and causes the latter to follow a slot in piston blade and draw the same towards center or until the blades are flush with

the piston ring. There being then no obstruction to the oil it passes freely round with the flywheel, allowing the driven shaft to remain stationary. Power is applied on releasing the foot pedal, which action confines the oil between the blades within the clutch casing and causes piston rings to revolve with the flywheel. More or less power can be applied according to the control of the foot lever, the gradual advance of the blades towards the outer wall of the flywheel being proportionate to the power transmitted through the clutch to the car.

Nutting Machine Company, Dayton, O.—Under the title of the "Nu Zent" this concern is just placing a novel carbureter on the market. Although it is based on the fundamental principles of carburetion as established by experience during the past several years, it com-



SECTION VIEW OF NU ZENT CARBURETER.

bins them in a somewhat different manner, and in its design embodies some that are quite new. For instance, the level of the float is adjustable from the exterior. Its construction and operation will be evident upon reference to the cut showing it in section. The suction at H causes fresh air to enter at L, producing suction at the spray nozzle and spraying the gasoline against the cone A; the gasoline and air are drawn round the sharp outer edge of the cone and are then thrown against the corrugated surface of the inner side of the auxiliary valve B, from there passing through H to the engine. When the normal air supply is insufficient, the valve B is lifted by the vacuum, causing additional air to enter at J—a port extending around the entire circumference of the carbureter. The valve B lifts in accordance with the speed of the engine; thus making the opening between the cone and the under side of the valve proportionately greater as the speed increases, and insuring a uniform mixture at all speeds.

H. P. Electric Ignition.—The Auto Novelty Company, of Milwaukee, Wis., has purchased the rights for this country of the recently-imported H. P. Electric Ignition System. The "Sure Thing" spark plug has been designed to abolish the



"SURE THING" SPARK PLUG.

nuisance of fouling and short circuiting. Its manufacturers claim that even a continuous flow of oil will not affect its efficiency. A superior quality of imported insulating material is used in its construction, and the metal parts are finely electro-copper-plated, nicked and polished.

Improved Tire Inflation.—Like everything else in connection with the automobile business, the matter of tire inflation has come in for its share of attention and improvement, with the result that we now have, in place of the arduous hand pump, a small portable tank containing a mixture of CO² gas and nitrogen, which is liquefied at a temperature of from 65 degrees to seventy degrees under a pressure of about 750 pounds. This gas on being released from the pressure immediately regains its gaseous form and is perfectly dry and beneficial to the rubber. Plain CO² or carbonic acid gas has a tendency to filter through the infinitesimal pores of new rubber, and while after the first filling the tires will hold up, the best results are obtained when a little nitrogen is included in the mixture. In filling the tires with compressed air a goodly amount of moisture finds its way into the inner tube, and it is this moisture which sooner or later causes the tire to rot and crack. This gas being a preservative of rubber adds greatly to the life and resiliency of the tire. Another valuable feature is uniformity of pressure. This result can only be obtained where the source of supply is at a constant pressure (the gas being in liquid form, the pressure is always constant) and when the pressure is measured by a reliable gauge. The gas is not in any way inflammable or explosive. The apparatus, complete with gauge, fastens to any convenient portion of the car and weighs a little over twelve pounds; it fills a tire in about five seconds and inflates from twenty-five to thirty tires. Tanks can be recharged or exchanged in any large city, and can be procured direct from the manufacturers, the Standard Carbonic Company, Cincinnati, Ohio.

A Duplex Radiator.—A disadvantage of water-cooled engines is that any accident to the radiator, owing to frost, defective material, bad workmanship or other cause, frequently puts the automobile entirely out of commission. To prevent this the Duplex Radiator Company, of Detroit, Mich.,



FRONT VIEW OF DUPLEX RADIATOR.

has produced a double radiator consisting of two halves which work singly or as a unit. Ordinarily, the entire radiator is in use through double-ended inlet and outlet pipe fitted with four valves. When either half of the radiator leaks, the valves are closed and the defective half is removed for repair, while the remaining half continues in use. Also, during cold weather, when one half of the radiator is sufficient, the remaining half can be freed of water. Another feature of the Duplex system is a by-pass by the use of which, should the pump fail, a water circulation is assured by thermo-syphon.

Gabriel Shock Brake.—The structural feature of the new Gabriel shock brake are two steel springs separated at their extremities by a steel block and securely bolted together. The lower extremity fas-

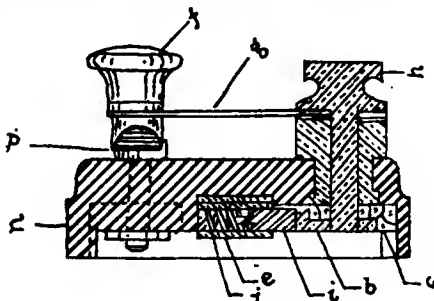


DETAILS OF GABRIEL SHOCK BRAKE.

tens under the clip of the spring by an angle steel plate. Between the two sides of the spring is a double steel plate securely riveted to a stud which extends

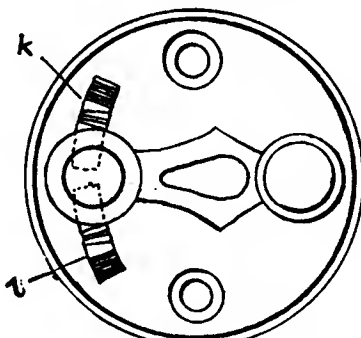
through a slot in the side of the brake nearest the frame and attaches thereto. These double plates are recessed so as to firmly hold a friction composed of camcl's hair belting which bears against the inside of the side plates. In addition to the steel blocks used at the upper and lower extremities, there are also inserted thin steel washers which, when removed, bring the two sides closer together, thus securing greater retarding force. Whatever slight longitudinal motion there may be is provided for by the attachment of the clip by a bolt to the bottom of the brake. Side motion of the car is provided for by making an elongated hole for the bolts which bind the side plates at the top, thus allowing each side plate to move independently of the other. The open space between the two sides of the spring is protected by a thin steel strip which gives the article a handsome appearance and prevents mud and dirt from entering the brake. The shock brake is light, compact and substantial and may be adjusted to either elliptic or semi-elliptic springs. It is made in three sizes by the Gabriel Horn Manufacturing Company, of Cleveland, O.

A Combination Switch.—The Pittsfield combination switch is of the click type, provided with a neutral point, A, in the fiber ratchet C. It has also a contact point or projection, D, which forms a part of the circuit when engaged with the spring-actuated steel plunger I. This



SECTION NEW PITTSFIELD SWITCH.

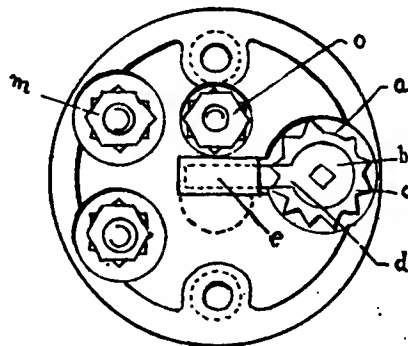
steel plunger is integral with neutral binding post O, thus forming a part of the circuit only when the fiber ratchet is in the position as indicated by bottom



TOP VIEW PITTSFIELD SWITCH.

view of switch in the drawing. This point of contact can readily be found by the operator, who knows how many clicks to count from the neutral point A in either direction. On the other hand, anyone not familiar with the combination will be unable to establish a circuit. The contact lever G is a fixture on the switch and is not detachable. The knob H serves a thumb piece for rotating fiber ratchet O for the purpose of either opening or closing the circuit. The neutral binding

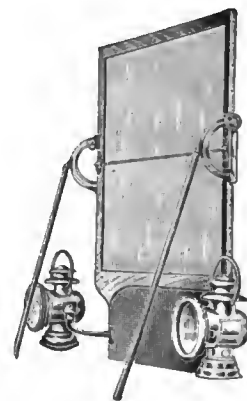
post connected directly to the units or coils is represented by O. The battery binding post is shown by M. This bind-



BOTTOM VIEW, SHOWING CONNECTIONS.

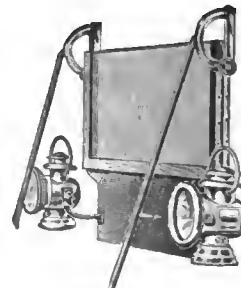
ing post is represented on the face or outside of the switch by the contact steps K and L.

Divided Wind Shield.—A glance at the accompanying cut will explain the nature of the Beecher divided wind shield now being constructed by the Limousine-Carriage Manufacturing Company, of Chicago. The shield was put on the market to meet the demand for something cheaper



BEECHER DIVIDED WIND SHIELD IN PLACE.

than the "Schildback." It has the same light center bar, but is hinged on this model. The small wheel which shows at the top of circle when glass is raised is on a bolt fastened to top frame and has a 1 1/2-inch stem with a loose washer next to the circle. By simply loosening these two wheels the shield can be folded, but it can also be stopped at any angle, and if the



BEECHER DIVIDED WIND SHIELD FOLDED.

lamps are in the way can be held perfectly rigid so as to clear them. All fittings and rods are solid brass, the frame is bound with half-oval polished brass, bottom boards are left six inches wide so they can be cut out to fit any shape dash. Size of frame is 40 by 33 high, allowing two inches between glass and dash. It is made in mahogany finish, natural ash or black.

THE AUTOMOBILE

AEROPLANE WITH 100-H.P. EIGHT-CYLINDER MOTOR

PARIS, March 12.—In the quiet peacefulness of St. Cyr, near enough to the capital to obtain all necessary supplies, but far enough removed to be free from the visits of the idler about town, Alberto Santos-Dumont is working the Union ten hours a day on his new aeroplane. Yesterday was a holiday and a select reception day, the doors of the big wooden shed being thrown open and the new *Bird of Prey* brought out on the military cadets' drill ground in the presence of a number of officers from the engineer corps at Versailles and a small body of aeronauts. No attempt was made at flying, the machine, though apparently ready for a trip, needing the addition of a number of small but important parts and the engine requiring some attention.

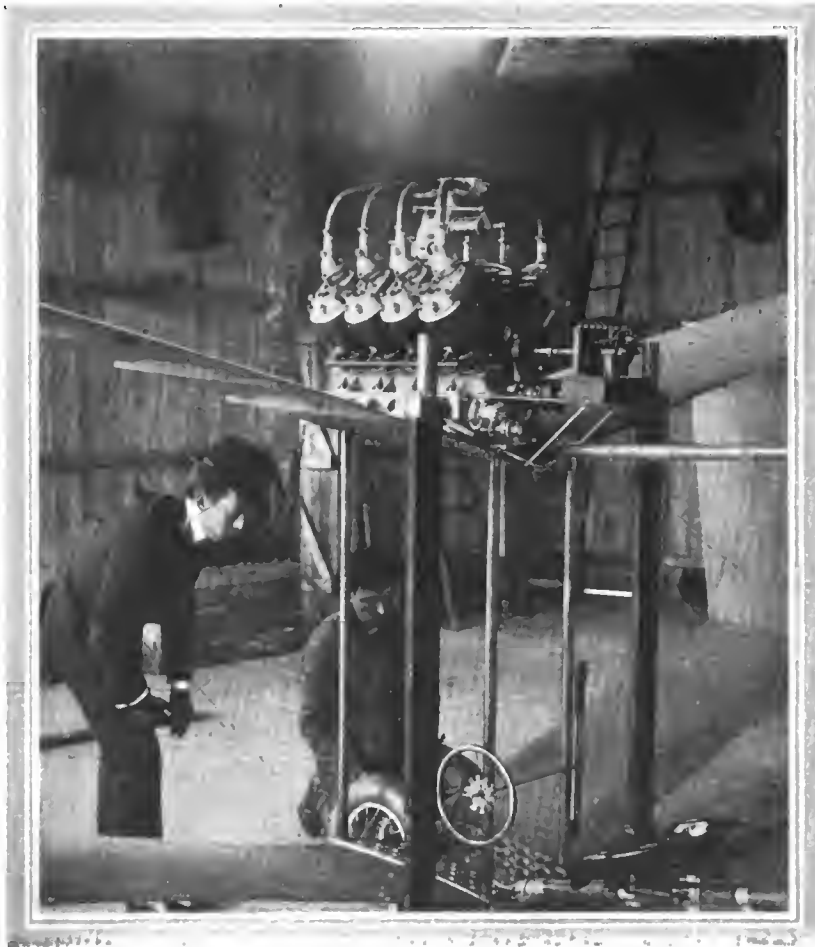
Santos-Dumont has profited by his past experience, the new flyer being a great improvement over the one with which he won the Archdeacon Cup for covering a distance of 220 meters in the air. It consists of two box-kite wings placed at an angle of eight degrees, having a spread from tip to tip of 42 feet. Their width is only 24 inches. All the canvas parts have been replaced by thin polished wood and the frame work is of light mahogany. The central frame is metal, the rear frame on which is mounted the rudder being of bamboo with metal stays. Total weight is 40 pounds less than that of the last flyer, *No. 14 bis*.

The most curious feature of the flying machine is that the motor, a 100-horse-power eight-cylinder Antoinette, is placed above and in the angle of the two wings. Metal stays, not shown on the engraving, will be carried up above the motor and will support the gasoline tank at the highest point. The two-bladed 78-inch alumi-

num propeller is placed in front of the apparatus. Santos-Dumont will be seated on a motorcycle saddle attached to the rear stay below and immediately behind the engine. He will sit in the attitude of a rower, with his legs stretched out on a small metal platform. Controlling levers will be immediately in front of the steersman. Instead of the pair of bicycle wheels, which always broke when the machine came down to ground, a single pneumatic wheel of small diameter but big bearing surface will be employed. Thus the machine will be very near the ground during its preliminary canter. To protect the pilot when running at high speed a celluloid wind shield will be fitted. It will only have a small area, as, owing to the position in which he is placed, the pilot will offer little resistance to the wind. The rudder of the new machine is placed in the rear. In addition there will be two

small lateral rudders to give a better equilibrium and aid in turning. As a matter of prudence the aeroplane will be equipped with a speed indicator so that the action of the rudder causing the machine to rise in the air may not be given until a sufficient speed on the ground has been attained. Thirty-seven miles an hour is the speed necessary before flight will be attempted.

Santos-Dumont declares that he has every confidence in the ability of the aeroplane to win the \$10,000 prize of the Grand Prix de l'Aviation, the conditions of which are that a one-kilometer circuit shall be covered at a distance of not less than three feet from the ground. In about a week the machine will be completely terminated and as soon as the drill ground is sufficiently dry and weather conditions favorable flight will be attempted.



SANTOS-DUMONT INSPECTING GROUND WHEEL ON HIS NEW AEROPLANE.



SANTOS-DUMONT'S FIFTEENTH FLYING MACHINE NEARING COMPLETION IN HIS WORKSHOP AT SAINT CYR.

M. Vuia, who commenced aeroplane experiments long before Santos-Dumont, has at last attained a certain amount of success. On the Bagatelle ground, in the Bois de Boulogne, several attempts were made this week. The first time the machine took a short jump only a few inches from the ground. On the second flight the machine rose four feet from the ground and traveled thirteen or fourteen feet. On a final attempt being made thirty or forty feet were covered at an increased height from the ground. M. Vuia is the second person in France to accomplish a successful flight on a heavier than air machine. Defects discovered in the aeroplane are its lack of equilibrium and a slight inefficiency in the 12-horsepower carbonic acid motor. On striking the ground one of the road wheels of the aeroplane was buckled up, thus preventing further trials for the present. It is interesting to note that the carbonic acid engine was designed by the late Leon Serpollet. In appearance the aeroplane resembles a bird with its wings extended. It is supported on a four-wheel frame, raising the wings about five feet from the ground.

Henri Kapferer has tested his new aeroplane built for him by Voisin Frères, and provided with a Buchet eight-cylinder engine. The trial took place on the Sartrouville plain, near Paris, but no attempt was made to rise from the ground.

De la Vaulx Finds Tobogganing Dangerous.

Comte Henry de la Vaulx, the well-known aeronaut, has been the victim of an unfortunate accident resulting in a broken leg, while tobogganing at Caux, Switzerland. He has been removed to the hospital of Saint-Jean-de-Dieu at Paris and is progressing as satisfactorily as can be expected. Owing to the complicated nature of the fracture, however, it is thought that it will be some time before the Count will again be able to take part in his favorite sport, and his chances of being able to participate in the Gordon Bennett balloon race at St. Louis are somewhat remote.

ITALY BARRED FROM BALLOON CUP RACE.

President Cortlandt F. Bishop, of the Aero Club of America, Monday received word that the International Aeronautic Federation had decided against the acceptance of the two Italian entries for the Gordon-Bennett Cup, same having been filed after the official closing of the entry list.

Lieut. Frank P. Lahm, last year's Cup winner, is to take charge of a government balloon station at Fort Leavenworth, Kansas, to be established there by the War Department.

MICHELIN TO OPEN AMERICAN FACTORY.

American tire manufacturers are to have a formidable competitor in the Michelin concern. M. Edouard Michelin, one of the heads of the great tire manufacturing company of Clermont-Ferrand, France, who has been in America for the last three weeks, announces that an American Michelin tire company has been incorporated with a capital of \$2,000,000. The new company has purchased an important rubber plant to which large additions will be made at once. A staff of expert workmen will be brought over from the French factory and the methods employed at Clermont-Ferrand will be followed closely in the American works. It is expected that the first Michelin tires constructed in this country will be ready to put on the market next September. By constructing in this country Michelin will save the 35 per cent. for freight and duty and will be able to sell at the same price as the American makers. M. Edouard Michelin, who has made all the arrangements for the American factory, is technical director of the main factory at Clermont-Ferrand, employing 3,000 workpeople and making 1,000 tires a day. In addition, the company has a factory in England making 500 tires a day, and one in Italy. M. Michelin sailed for France yesterday.

UNITING THE HOUSES OF CHARRON-CLEMENT.

A cablegram from Paris announces the approaching marriage of Fernand Charron, the founder of the G. G. V. firm, with Mlle. Clément, daughter of the head of the great Bayard-Clément factory, and sister of Albert Clément, the well-known racing automobilist. Fernand Charron was three times the champion cyclist of France, won the first Gordon-Bennett race, founded the G. G. V. firm in 1901, and retained the position of general manager when the company was floated as a limited liability company last year under the title of Charron, Limited. Lately he has paid much attention to race horses, being successful as a gentleman rider in a large number of contests. Mlle. Clément is a well-known figure at all automobile races, for she makes a point of witnessing every race in which her brother is engaged. Her father, Gustave Clément, thirty years ago a bicycle maker employing one man and a boy, obliged to sell his first machine before he could start on the second, is now one of the richest men in France. In addition to his huge factories near Paris and at Mézières in the Ardennes, he has large interests in the Michelin tire factory and the Panhard concern, and is the financier of the lessees of the National Opera house at Paris.

FIRST BANQUET OF THE AERO CLUB OF AMERICA

THE first annual banquet of the Aero Club of America was held at the Hotel St. Regis, New York City, Thursday evening, March 14, 1907. The function called attention to the fact that there exists in this country a substantial organization of over a hundred members, the object of which is to advance the development of the science of aeronautics and kindred sciences, and to encourage and organize aerial navigation and excursions, conferences, expositions, congresses, and races. Orville and Wilbur Wright, the famous Ohio brothers, were expected guests of the occasion, but it was announced by President and Toastmaster Cortlandt F. Bishop that these two noted aeronauts were modest in such degree that it could not be conceived of in New York. Nevertheless, a letter was read from the Wrights wherein they reiterated and emphasized the claim that they have successfully solved aeroplane traveling.

President Bishop gave greeting to nearly 200 participants in the banquet, which had some excellent oratorical talent, even though in several instances brevity was to them an unknown quantity. The Gordon-Bennett trophy, which Lieut. Frank Lahm last year won for America, divided attention in the center of the speaker's table with the Aero Club Cup.

It so happened that the annual dinner of the Aero Club of France was held on the same night as that of the Aero Club of America, and cablegrams of best wishes were exchanged between the two organizations. The health of Lieut. Lahm was drunk standing during the playing of the National air. A message from the lieutenant was greeted with much applause, and, all in all, the occasion was one of intense enthusiasm and exceeding optimism regarding aerial flight. President Bishop announced October 19 as the date of the balloon race at St. Louis, and five countries will participate. Preparations for this great international event are progressing favorably.

President Bishop introduced James E. Smith, president of the Business Men's League of St. Louis, as the first speaker. Mr. Smith described the plans made for the big race, for which the city will furnish free gas, soldiers, and four extra prizes.

Colgate Hoyt, president of the Auto Club of America, followed. He pointed out a few of the advantages aeronauts had over autoists. The aeronaut had no tire troubles, and there were no spotters up in the air, where the coast was clear.

President Tucker of the Jamestown Exposition talked of the plans being made for aeronauts to visit Jamestown this summer, where there would be an aeronautical congress from April to November, with a recess to allow all hands to visit St. Louis. He declared that when they visited old Virginia they would not want to leave it.

McCready Sykes told many stories that put his audience in good humor, and E. B. Bronson described the first trip made in a dirigible balloon in this country, 'way back in 1863, when a machine built by Dr. Bartholomew Andrews sailed from Perth Amboy and made thirty miles in 14 1-2 minutes. Dr. Andrews experimented for years, and on June 21, 1849, had so far perfected his machine that he advertised in the New York *Sun* an exhibition to take place on July 4, and charged 50 cents admission for one man and two women. This ascension was not a success, because the steering apparatus did not work well.

The Hon. John S. Wise told of a famous ascension which he once made—in a dream—and descanted on the glories of Old Virginia. Burgess Johnson contributed some more humor, and then Anthony Fiala, the noted Arctic explorer, gave one of the most interesting talks of the evening, accompanying it with some excellent moving pictures. Mr. Fiala had some doubts as to the success of Mr. Wellman in utilizing the airship in reaching the North Pole.



PROMINENT AUTOMOBILISTS WILL BE NOTICED AMONG THOSE PRESENT AT THE HOTEL ST. REGIS, THURSDAY EVENING, MARCH 14, 1907.



LAUNCHING LA RAPIERE II. FROM THE TELLIER YARD BELOW AUTEUIL VIADUCT, PARIS.

LA RAPIERE II. A NOTABLE MONACO ENTRANT

PARIS, March 11.—There is tremendous activity among the numerous contestants in the Monaco motor boat meet to open on April 1. At every building yard of importance on the Seine in the neighborhood of Paris and in a few of the southern ports where motor boats have taken some hold work is being pushed forward as fast as possible to be ready for the opening of the meet. Although Paris is a considerable distance from the sea and on a river offering but meager facilities for fast motor boat work, it is in the neighborhood of the capital that the majority of the Monaco racers are being built. The grouping of the important French automobile factories around Paris is probably responsible for this.

At the Tellier Fils & Girard yard, just outside the city walls, *La Rapière II.* was launched this week and underwent trials on the straight stretch up to Billancourt. *La Rapière* is the worthy successor of the original *Rapière*, also built by Tellier Fils & Girard and engined by Panhard & Levassor, which carried all before her in the eight-meter class. Richard Brasier, with the famous but unfortunate *Treffe à Quatre*, was the first in France to produce a motor boat which attracted public attention for its remarkable speed. That was in 1904. The following year *La Rapière* was on everybody's lips, for she proved herself the fastest all-round boat produced up to that date. In her own class she was unbeaten and even in the open races against such monsters as the 300-horsepower *Dubonnet* and the *Panhard-Levassor* she was a most formidable rival. *La Rapière II.* is looked upon as quite as dangerous as her predecessors.

Other boats nearing completion at the Tellier yard are the *Mouvette* and the *Panhard-Tellier*; in addition the firm will be

represented by Baron de Cater's *Seasick*, a craft which showed a remarkable rate of speed last year.

The Pitre yard at Maisons-Laffitte, on the Seine, is remarkably busy. Vincenzo Florio's steel boat, *Mercedes-Florio*, is receiving very close attention and should be ready to take the water in about a week. *New Treffe II.*, to carry a Brasier motor, and an unnamed boat for Henry Fournier, equipped with an Itala motor, are on the stocks side by side with a small fleet of cruisers. Pitre has probably turned out more racing boats than any other firm in France.

Comte de Lambert's hydroplane, *Glisseur*, was added to the list of entries for Monaco at the last moment, thus providing a companion for the *Nautilus-Obus*.

TENNESSEE STATE HIGHWAY PROJECT.

MEMPHIS, TENN., March 18.—The inspiration of the east has reached the western section of Tennessee, giving its habitants also a hankering for good roads. The legislative council of the city of Memphis will be asked to co-operate with Nashville and other important cities in the State to establish a system of State highways. A bill contemplating the preliminary plans for such a system of roads has been prepared and will be introduced immediately after the recess. Despite the steady progress which has been made in the Central and Eastern States in favor of good roads, the South has up to the present remained indifferent. The bill which the city council will be asked to support only asks for a sufficient appropriation to cover the expenses of a preliminary tour. The idea is to connect Memphis with Knoxville by a State road.

OLYMPIA COMMERCIAL MOTOR SHOW

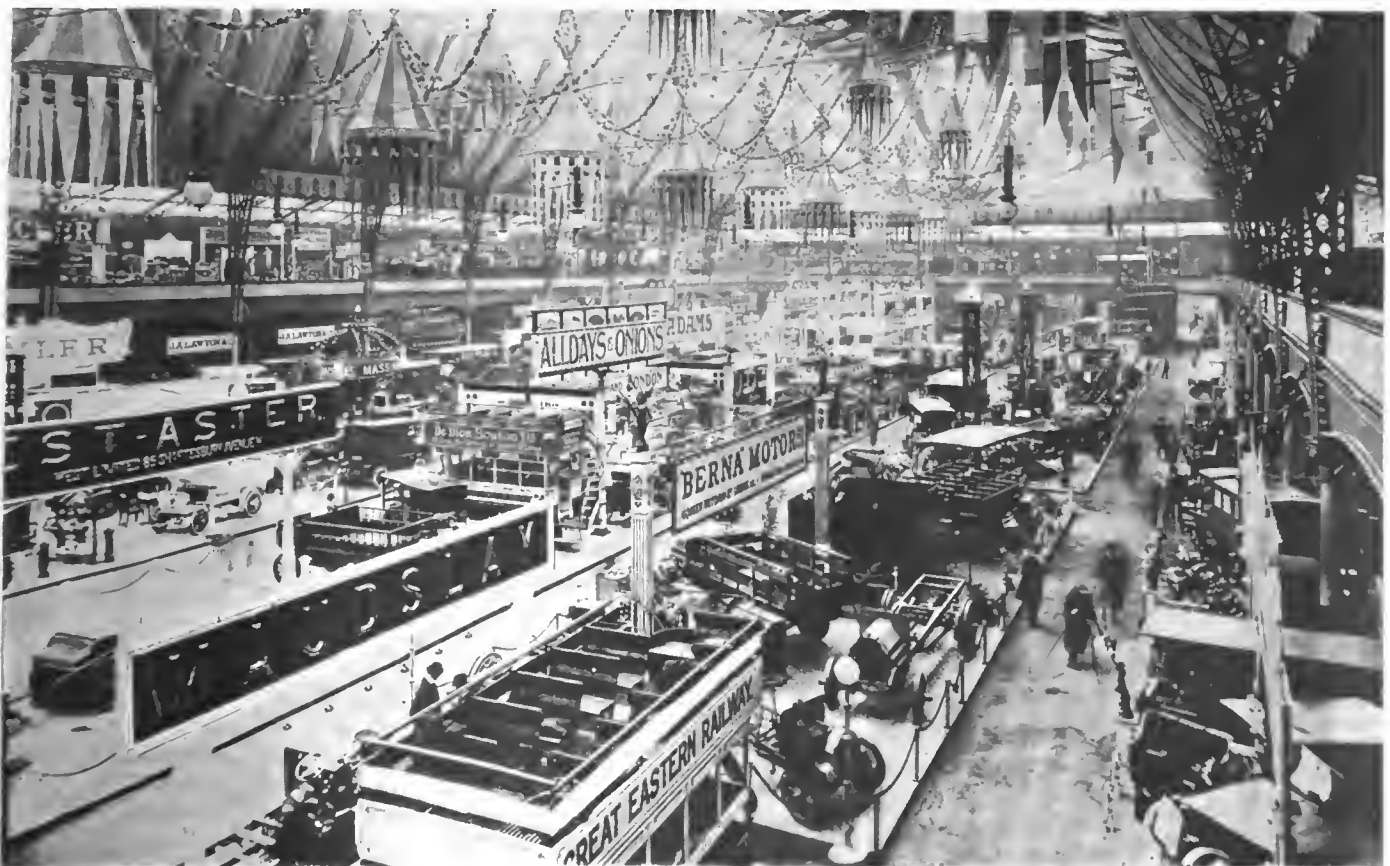
LONDON, March 9.—John Bull's ample chest swelled with national pride when the Lord Mayor of London came in all his official dignity to open the commercial vehicle exhibition in the banner bedecked Olympia Hall. His pride is not vain vanity, for the British motor constructor has indeed made enormous progress in the development of the automobile for commercial purposes. What pleases the Britisher most of all is that the Olympia show is British. The technical man knows that many of the engines are imported, that he has still to deal with Panhard & Levassor, De Dion-Bouton, Renard, Dietrich, Lacoste & Battemann, Darracq-Serpollet, and a host of others whose domicile is on the banks of the Seine; he knows that most of his big fleet of noisy, smoky omnibuses are made in Germany, and that France is not altogether foreign to their birth. But John Bull looks only at the labels which are All British. There is room for national pride, for the assembly of commercial vehicles is much more British than any other group of automobiles ever assembled in public exhibition in the metropolis. When Continental countries were profitably engaged in constructing high-grade pleasure cars and organizing impossible races the Anglo-Saxon was quietly occupying himself with the motor for business purposes. There were many disappointments and heavy losses between 1899 and 1901; from 1902 to 1904 there was steady improvement; at the end of 1904 the Heavy Motor Car Order gave an impetus to the industry by legalizing five-ton wagons and tractors and permitting the use of double-deck omnibuses. Within eighteen months London has added 250 steam wagons and tractors and 800 motor 'buses to its effective means of street transport.

It was owing to this extraordinary development that the management of the Olympia show decided to reserve last November's event entirely to pleasure automobiles and to hold a separate

show in the same building for all classes of commercial automobiles, motor boats and accessories. The success of the show just opened proves the wisdom of the decision. There are eighty stands on which are shown light and heavy delivery vehicles, omnibuses, etc. The total number of exhibitors is 250. Grouped in the main hall are the various classes of commercial vehicles and machine tools. In the annex are the motor boats, and the galleries are reserved for tires and accessories. The decorative scheme is the same as was employed for the November Olympia show.

Gasoline motors are in a large majority for everything except the heaviest work. British firms are more numerous than the united foreign houses, though the latter still present a strong front, with such well-known names as De Dion-Bouton, Delahaye, Dietrich, Fiat, Gobron-Brillié, Isotta-Fraschini, Hotchkiss, Mercedes, Mors and Berliet.

Steamers are a very good second. Excepting the Darracq-Serpollet combination, all the exhibitors in this class are of British origin. Steam has always been a favorite in this country, and although gasoline has secured first position for light and medium class work, it has been unable to oust its older rival or even successfully compete with it for powerful hauling. There is a certain amount of discussion among users of steam haulage on the relative value of steam wagons and tractors hauling a number of trucks. A tractor will cost about \$2,250, while a steam wagon capable of doing the same amount of work would call for the investment of \$3,500; but as the former must be completed by a number of trucks, there is but little difference in the total cost. Where regular five-ton loads can be furnished the steam wagon complete in itself seems to offer an advantage. The tractor is generally more profitable where varying loads have to be dealt with. Cost of maintenance, including driver, interest,



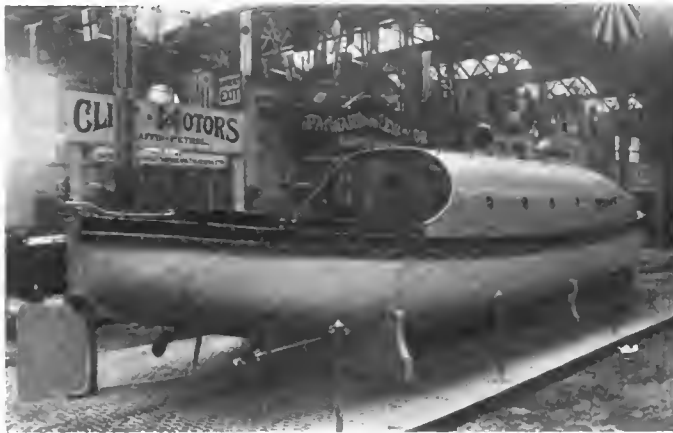
GENERAL VIEW OF THE OLYMPIA, LONDON, IN WHICH THE FIRST BRITISH COMMERCIAL VEHICLE SHOW IS BEING HELD.



FIAT FIVE-TON 40-HORSEPOWER TRUCK.

wages, stores, maintenance, depreciation and insurance, is generally the same in each case, \$25 a week being an average sum for a five-ton wagon.

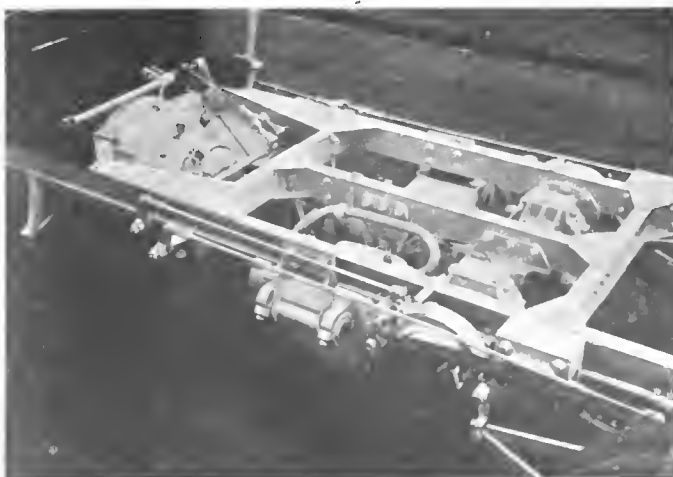
Electric vehicles are a very meagre class. The British business man has no faith whatever in electricity as a factor in commercial delivery work. Where slow speed and big hauling power are



BRITISH 40-FOOT SEAMLESS STEEL BOAT.

needed he employs steam, where he wants quick service he uses gasoline. Between the two there is no room for electricity. Of the four electric vehicle firms two show light vehicles, ambulances, etc., and two others, Greenwood & Batley and the British Thomson-Houston Company, have gasoline-electric vehicles.

Among the special features of the show are the number of omnibuses to be used by railroad companies for station work and



STRAKER-SQUIRE GASOLINE-ELECTRIC 'BUS.

as feeders in districts where the iron rail has not penetrated. Practically every important railroad company in England has adopted gasoline 'buses for use from their depots. Tramway companies, too, have taken up this class of vehicle as feeders and connecting links to their different termini. Rollers and lawn mowers are being given more attention than ever before. Whether used for road making, rolling or cutting grass, they are all operated by gasoline motors. The Renard train, the invention of the late Colonel Renard, attracts considerable attention. The train is not new, but it has only recently been introduced to England, and will shortly be constructed in the Daimler factory at Coventry.

In the marine section of the exhibition there are thirty-five firms, compared with twenty-nine at the show held fifteen months ago. Excepting Panhard-Levassor, Delahaye, and De Dion-Bouton, they are all British. The motor boat exhibit is far from being so comprehensive as the commercial vehicles, a number of important firms abstaining from exhibiting, owing to the diminished support given by the show committee.



EVIDENTLY CANADIAN TRADE IS COVETED IN ENGLAND.

THE TIRE PRODUCT OF TIRETOWN.

AKRON, O., March 18.—Approximately 62 1-2 per cent. of all of the tires on automobiles exhibited at shows in the large cities this winter was manufactured in Akron. This is the computation secured after an impartial investigation, and proves how important Akron is as the tire center of the country. The figures include the Boston show, held last week. By companies the tire count for all of the shows is as follows: Diamond, 591; Goodrich, 340; G & J, 117; International, 117; Morgan & Wright, 110; Michelin, 97; Continental, 90; Goodyear, 77; Firestone, 54; Ajax, 16; Fisk, 70. The remainder, 21, is scattered among other makes, the total being 1,700. In all 1,788 pleasure cars were shown at the exhibits.

The shows included in the statistics are: Madison Square Garden, New York; Grand Central Palace, New York; Chicago, Buffalo, Cleveland, Washington, Detroit, Philadelphia, San Francisco, Boston, and Minneapolis. The Akron companies in the above list of manufacturers are the Diamond, Goodrich, Goodyear, and Firestone. The last named, of course, manufactures many solid tires.

BOSTON BELIEVES IN MARCH DATES.

Boston, March 16.—The fifth annual show of the Boston Automobile Dealers' Association, the most successful exhibition of its kind ever held in New England, came to an end this evening. From whatever point of view it is considered, this show has been satisfactory. The exhibitors not only have sold many cars, almost every machine in the many spaces being marked with a "Sold" card, but they have got a very large number of prospective customers in line, and have enough follow-up business to keep them hustling until well into the spring.

Those Inter-City Winter Runs.

Besides the demonstrating, the outdoor side of the show attracted much attention on account of the runs from New York. Early in the week four cars were started from that city for Boston. They were an Aerocar, Dragon, Welch, and Wayne. The Dragon, Welch and Wayne were in a sort of competition for a trophy. The Aerocar came through safely, and also the Welch and the Dragon, and finally the Wayne, after much hard luck.

Friday a new record was established between New York and Boston by R. G. Kelsey, driving the Matheson with which the New York-Chicago run was made in January. Kelsey covered the distance from New York to this city in 14 hours 5 minutes elapsed time, his actual running time being 12 hours 45 minutes.

Boston Not Keen on Earlier Dates.

In consequence of the stories that have come from New York this week to the effect that both the A. L. A. M. and the A. C. A.-A. C. M. C. A. shows in that city would be held earlier than usual, there has naturally been some discussion of the question of holding the Boston show a month or more earlier. While some dealers think that a February show would have its advantages, the majority seem to feel that for the retail business March is the best time for the Boston show. If the New York shows are held in the fall it will help out the Boston show, in that when show-time comes the local dealers will be much better prepared than they are now to make deliveries. Very little agency business has been done here, as far as known not a

single new agency being placed in this city during the show, so that all the business is between the dealers and people who are to own cars.

Providence Show This Week.

When the show closed to-night there was a grand hustle to get the cars, which are to be shown in Providence, out of the buildings. Many of the exhibition chassis and cars are to be sent to Rhode Island, while others will be kept in the local salesrooms for a few days or a week, in order to give show visitors a chance to see the machines at their leisure.

MARKET FOR AMERICAN AUTOS IN SPAIN.

Referring to the international automobile exposition to be held next May in Madrid, Consul-General B. H. Ridgely, of Barcelona, sends several prospectuses of the exposition wherein all the conditions are set forth. Copies of the same may be secured from the Bureau of Manufactures. Mr. Ridgely writes:

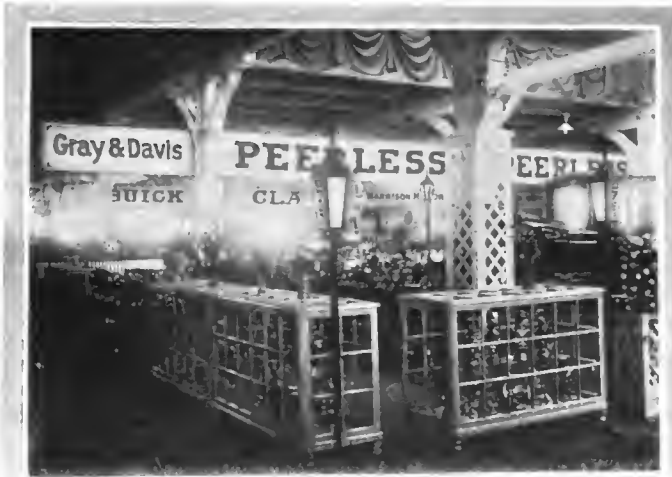
"This will be an excellent opportunity for American manufacturers to exhibit their products, but it must be repeated that it will not be worth while to show any one-cylinder machine here, as there is a pronounced prejudice against them, and virtually no sale for them. This same prejudice even applies to two-cylinder motors, and as a matter of fact there is little demand in Spain for other than those of four cylinders. Manufacturers who can offer a good, robust, cheap machine of this character, of from 16 to 20 horsepower, at prices ranging from \$1,500 to \$1,800, would probably find a prompt market.

"A good two-cylinder buckboard, provided the motor did not vibrate too strongly, however, would sell in Spain, if it could be offered at a reasonable price, and manufacturers having such machines to export would do well to exhibit them at the Madrid show.

"With the prospectuses referred to, there are various application books which intending exhibitors can fill up and forward to Monsieur le Directeur de l'Exposition de l'automobile, aux soins du Royal Automobile Club d'Espagne, Madrid, Spain. Automobiles intended solely for display at the exposition will be admitted into Spain free of customs duties."



FORMIDABLE PHALANX OF DEMONSTRATING CARS AT BOSTON'S AUTO SHOW, THAT WAS KEPT BUSY LAST WEEK.



A TRULY ARTISTIC BOSTON SHOW STAND, GRAY & DAVIS.

SOUTH AFRICA AS AN AUTOMOBILE MARKET.

Writing from Cape Town, South Africa, Special Consular Agent Raymond F. Crist throws considerable light on the status of South Africa as a market for the American automobile. "American makers have apparently entirely overlooked this fine market," he says, "for inquiry fails to reveal the presence of more than one American agent in all the British South African colonies, though it is an outlet to which the English and Continental makers have found it profitable to devote close attention. American makers appear to be quite content with an intermittent and spasmodic forwarding of beautifully gotten-up catalogues—an absolute waste of printed matter, postage and time. Automobiles in South Africa are not an article of luxury indulged in solely by those desiring pleasure and recreation—they are indispensable to the business success of every man who has relations with the mining industry, many of the most important mines being located fifty miles from Johannesburg, while the Witwatersand "Reef" extends for more than seventy miles, east and west.

The Johannesburg register shows 768 cars now in use, while 200 are reported to be in use in Cape Town. Prices range from \$1,750, averaging about \$2,000, and at a conservative estimate, there are said to be about \$1,000,000 worth of automobiles in Johannesburg every day, while along the length of the "Reef" probably twice that value will be found. The average car is selected for its ability to withstand the hard knocks of the roughest kind of roads, climb steep grades and do the greatest mileage per gallon of gasoline. Although twelve to fifteen miles per gallon is now about the maximum average, upward of fifteen



THE WAYNE CAR IN WORCESTER EN ROUTE TO BOSTON.

miles per gallon is demanded of new cars. Horsepowers range from 6 to 30, but speed is not desired, particularly owing to the nature of the roads. Steam cars are scarce on the Rand, owing to their greater fuel consumption. High clearance is imperative, and while both side-chain and shaft drives are popular, the latter is favored, owing to the great amount of sand, which shortens the life of the chains. Four speeds are required, as with three it has been found that even the lowest is too fast to plough through the long and heavy sandy stretches. Only water-cooled cars are used and they must be equipped with the heaviest tires.

American makers should avail themselves of this exceptionally rich field for the sale of automobiles by sending out salesmen to directly represent their machines. They must be prepared to meet active competitors now in the field from every auto-producing country and whose cars already have a reputation for meeting the difficulties of South African automobiling. A large field is also offered for motorcycles, most of those now seen being of British and German make, the latter predominating. They range in price from \$200 to \$250 and are very largely used. In Durban and Cape Town there are regular automobile and motorcycle clubs. For the year ending June 30, 1906, British South Africa imported \$836,685 worth of motor vehicles.



ALBERT CHAMPION WITH IGNITION SURROUNDINGS.

SZISZ TO DRIVE AN AMERICAN'S RENAULT.

George C. Tyler, the well-known theatrical manager, who left last week for Europe, has just had built for him by Renault Frères, of Paris, the fastest touring car the firm has yet turned out. It is of the standard four-cylinder pattern, of 90 horsepower, and is guaranteed to do 118 miles per hour under the best conditions. Mr. Tyler will be met at Cherbourg by a party of friends, including Booth Tarkington and Harry L. Wilson, the latter the author of "The Spenders." Szisz, the Grand Prix winner, will be at the wheel of the new car. On his arrival in Paris, Mr. Tyler and his party will start East at once, and will go straight through to Constantinople. Some trouble is anticipated in getting the car over the Turkish border, and Mr. Tyler has armed himself with letters from Washington.

On Mr. Tyler's return he intends to visit Bucharest, Budapest, and the Austrian Tyrol; then go to Sicily; through Italy, Germany, and Denmark, and up to Norway, to which, by the way, he introduced the first automobile some few years ago. On his return he will travel through the south of France and will visit the poet and dramatist, Edmond Rostand, at his place at Cambo, at the foot of the Pyrenees. Mr. Tyler last year made 20,000 miles through Europe, and this summer expects to do more.

RUDIMENTS OF VALVE AND IGNITION TIMING

By CHARLES B. HAYWARD.

JUDGING from the frequency with which questions crop up on the subject of valve setting as well as inquiries regarding the reasons therefor, it is quite evident that the importance of the proper timing of the valves of a four-cycle motor is something that is not altogether clear to even that large class of autoists who are far beyond the stage of being merely good drivers. Every now and again there comes to light the old, old story of the man who took his motor apart and found he could not get it together again, but he is greatly in the minority when compared with the case of those who take the motor apart and put it together again—seemingly the same as before, but find that it either refuses to work altogether, or displays such strange symptoms of internal disorder that they are utterly at a loss as to the nature of its ailment. After trying every resource of the experienced driver with no result, the car is sent to a repairer, and there is more than one instance on record where the efforts of the latter have not been any more productive of betterment than those of the owner. To cite but a single instance, there may be mentioned the case of an autoist whose experience extended over several years, during which he had been the owner of no less than five cars, all of which he had taken care of personally, making all ordinary repairs and adjustments, and from all of which he had had good service, the car in question having done several thousand miles with but infrequent minor road troubles before the occasion in question arose. Owing to the peculiar design of the car, it was impossible to dismount the transmission without dismantling the motor—a fact that sheds considerable light on the accessibility of cars of not such extremely ancient vintage, as the origin of the one in question dated back but a few years.

An Instance in Point.

After relating the events that led up to the dismantling of the motor and the fact that continuous trouble followed in the wake of its reassembling, the writer goes on to state that a local repairman and machinist devoted several days' time to it with no result whatever. The case was not an extreme one, as the engine would run in a fairly satisfactory manner when not under load—something that tended to make the trouble appear more puzzling. To sum up the ailment briefly, there was such a considerable loss of power that the car could hardly be run on the high-gear at all, being incapable of doing ten miles an hour on the level, the most noticeable symptom being an escape through both the inlet and exhaust valves that sounded somewhat like backfiring. No amount of investigation of the carbureter or ignition system sufficed to reveal anything amiss, so that an appeal was made to a higher authority for advice in the matter, coupled with the significant statement that no more tinker work was wanted, as it had proved both expensive and unsatisfactory.

The case was not a difficult one to diagnose; everything pointed to improper timing, particularly what was referred to as a sort of backfiring which showed that neither the inlet nor the exhaust was being closed at the proper time, from which it is also quite evident that they were not being opened at the correct moment either, so that the motor was, in fact, running on but a fraction of the charge it was designed to get, and in consequence, but a fraction of the compression required for it to produce its rated output. Under such conditions, it is more of a wonder that it was possible to carry any load at all than that there was so much wrong, as with the modern high-speed motor of the automobile type, such a derangement is usually more than sufficient to prevent the motor from developing any power at all where it does not prevent its running.

Before taking up the subject of valve timing, it may be well to recall the functions of the four-part cycle, particularly as the present is not intended as a technical exposition of the subject,

but rather one for the enlightenment of the novice. Starting with the engine dead, these are suction, compression, combustion and exhaust, following each other in the order named.

Elementary Requirements of Timing.

These four parts of the cycle must take place for every power stroke delivered by the engine, and each one must be complete in itself in order that the motor may deliver its maximum rated power. In other words, each one of these functions constitutes a complete operation in itself, and in consequence, any attempt to make them overlap one another unduly is bound to result in a loss of efficiency. When carried to an extreme, as in the case when the camshaft is improperly placed, it is easy to realize that this sequence may be lost entirely and the motor accordingly refuse to work. For instance, suction cannot take place unless there is a partial vacuum created in the cylinder by the down stroke of the piston; that is, the pressure in the cylinder must be reduced below that of the atmosphere in order for the charge to enter. If the exhaust valve remains open after the opening of the inlet valve, it is evident that these conditions will not be fulfilled. Taking the next operation, that of compression, it is at once apparent that unless the inlet valve be closed very shortly after the completion of the suction stroke, that more or less of the charge will be forced out through it, which will likewise be the case should the exhaust valve be improperly held open at this time. Then again, should the latter begin to open prematurely, or at point very early in the travel of the piston on its power stroke, that much of the useful expansion of the charge will be wasted through the exhaust, as was the case on some of the early motors, which made it next to impossible to muffle them efficiently. Should the inlet valve open too long before the completion of the exhaust stroke, some of the burnt gases are apt to be driven out through the intake pipe, temporarily putting the carbureter out of action and greatly reducing the amount of charge that the cylinder can draw in. Should either of the valves happen to be open at all when ignition occurs, or at any point during the greater part of the power stroke, the pressure will blow some of the burnt gases out through it, as seems to have been the case in the instance referred to where it is stated that something similar to backfiring occurred at both valves all the time.

Factors to be Considered.

Theoretically, then, it is plain that the inlet valve should open at the upper dead center, or beginning of the suction stroke, and close exactly at the other end of the stroke. In the case of the exhaust valve this should be reversed, opening exactly at the lower dead center and closing at the upper, at the same time as the inlet valve opens. But there are factors to be considered in the accomplishment of this which render it necessary to give both of the valves what is termed a "lead," that is, to open them in advance of the points indicated by the theory of the matter. And this is further complicated by mechanical considerations, so that, particularly in the case of very high-speed motors, the operation of opening the valves is something that is begun long before the completion of the respective strokes. The inertia of the valve itself and the opposing pressure of the retaining spring must both be overcome before the valve can begin to leave its seat. It is obvious that it cannot be forced open with a jerk and allowed to reclose with a snap, if smooth action and durability are requisites. This, of course, is a matter that bears more closely upon cam design, but it is evident that it closely affects the timing, as the necessity for opening and closing the valves progressively is important as bearing upon the time element. The easier the curve of the cam, the longer time will be required to lift the valve to the

full open point, and a correspondingly longer period will also be required for it to return to its seat. Naturally, this is also influenced by the extent to which the valve is lifted.

Before the advent of the automobile motor, the average stationary engine was designed to run at speeds varying from 150 to 300 r. p. m., the latter usually being the case with units of less than 12-horsepower and the former in engines over this power. As it was also customary to make the stroke considerably longer than the diameter of the bore, many Continental engines having a stroke of twice the bore, it is apparent that there was considerable leeway permissible in the matter of valve timing. On the other hand, many automobile motors are made "square," that is, the bore and stroke are the same, while in the great majority of instances, the stroke is seldom more than 10 to 15 per cent. greater than the diameter of the bore. In addition to this, few automobile motors are designed to run at much less than 1,000 r. p. m., and most of them at much higher speeds. An engine running at 300 r. p. m. is making 10 strokes per second; an automobile motor running at 1,200 r. p. m. is making 40 strokes per second, or a complete revolution for every .025 second, which means a stroke in every .0125 second. However, as the camshafts only turn half as fast as the crankshaft, they make one turn in every .05 second at 1,200 r. p. m., but when five hundredths of a second must be again divided into

being conducive to silent and easy running, as it eliminates to a great extent the hammering action of the valve in returning to its seat, beside insuring the quick and unobstructed passage of the gases and the elimination of wire-drawing of the fresh charge, which was troublesome in early engines.

But the question of valve diameter, lift and other important essentials connected with this part of the motor, is found to differ in such a great number of instances, and in some cases so radically, that it is only natural that a similar divergence should be found where the matter of timing is concerned, coupled with an equally great variety in cam profiles. It is needless to go further into this aspect of the subject here, as regardless of the great number of differences to be found and the varying standards followed, the underlying principles involved are the same in all cases.

The Necessity of Giving a "Lead."

As already mentioned, theoretically the inlet valve should be fully open for the suction stroke at the beginning of the downward travel of the piston on this stroke. How long before this point is reached the operation should commence, depends upon the speed of the motor, and is restricted by the consideration that the inlet should not actually open before the exhaust valve closes, as the burnt gases may either be blown out through the

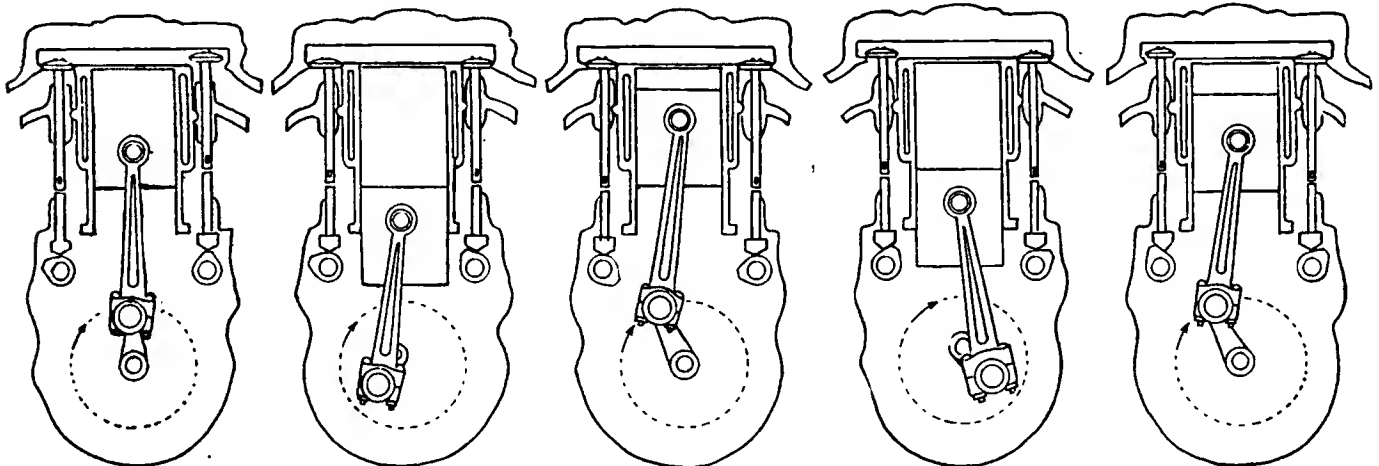


FIG. 1.

FIG. 2.

FIG. 3.

FIG. 4.

FIG. 5.

fractional parts in order to cause the opening of the valve to occur at the proper time, it is evident that only a slight divergence one way or the other is necessary to seriously impair the efficiency of the result, if not to prevent the proper functioning of the motor altogether.

Influence of Valve Design.

It is evident that the design of the valve itself must likewise be taken into consideration, but for present purposes it is merely necessary to touch upon it. Modern practice in automobile motor design favors the use of an inlet valve equal to one-fourth the cylinder diameter, and an exhaust of one-third the cylinder diameter, but as it is generally customary to make all the valves the same size to achieve interchangeability in this respect, a compromise between these two limits is usually adopted. With the mushroom type of valve on a seat with walls at an angle of 45 degrees, a lift equivalent to one-fourth of the valve diameter is required to give the theoretical full opening. That these figures are not closely adhered to by many designers is evident from the fact that not a few motors of 5 or 5 1-2-inch bore have valves of 2 or 2 1-4 inches diameter, with a lift of but 1-8 to 3-8 inch, the opening thus being fully 40 per cent. of the cylinder diameter and the lift less than 10 per cent. of the valve diameter, rather than 25 per cent. as above given. There is a tendency on the part of designers of high-speed motors to thus enlarge the valve diameter in order to reduce the lift, this

carbureter or some of the fresh charge from the latter drawn through the cylinder and out the exhaust valve. The closing of the exhaust valve and the opening of the inlet should accordingly be as nearly simultaneous as possible, and in the rough line sketches herewith appended, which are merely designed to furnish an outline of the necessity of giving the valves what is sometimes referred to as a lead, Fig. 1, which is intended to illustrate a motor at the beginning of the suction stroke, shows the former closed and the latter fully open. The piston descends the full length of its travel and at first sight it would appear as if the closing of the inlet valve should coincide with its arrival at the latter, but in addition to the mechanical considerations referred to in connection with the spring and valve, there are similar influences to be taken into account where the charge is concerned. The mixture of gas and air has both inertia and momentum; it does not rush into the cylinder the moment the valve opens, probably half the travel of the piston being required to get it well under way, but by the time the piston is at the bottom of its stroke, the gas has just attained considerable velocity and is pouring into the cylinder in considerable volume. On the other hand, compression of the freshly drawn-in charge does not begin to any extent the moment the piston reverses its travel. In addition to the almost incalculable period of time, speaking of high-speed motors, that it remains stationary at the bottom of the stroke before starting upward, quite an appreciable portion of the first part of the piston's upward travel is

required to create sufficient compression to overcome the velocity of the incoming gases. The point where these two forces exactly balance one another and where holding the valve open any longer would result in driving a part of the charge out again, is that at which the valve should close in order to attain the greatest efficiency. Fig. 2 illustrates approximately the distance beyond the lower dead center for which the inlet valve remains open. It is evident that if this should be caused to occur before or even exactly at the end of the suction stroke, the charge entering would constitute but a fraction of the total cylinder volume; the compression would be poor in consequence and the motor would develop but little power. Where the speed is very high, it is possible to make this point of closing as late as 20 per cent. of the compression stroke, but it is probable that the average allowance will be in the neighborhood of 6 to 12 per cent., or approximately 21 to 43 degrees on the crank circle, the measurement usually being made on the latter, and marked on the periphery of the flywheel.

The influence of advancing the point of ignition is considered subsequently, so that, assuming the compression and firing strokes to have been completed, the proper time for opening and closing the exhaust valve may next be taken up. In Fig. 3 are shown the approximate relative positions of the cams and crank during one part of the intermediate operations, those of compression and ignition, both valves being closed. The charge would be ignited at about the point shown with the spark well advanced

Advancing and Retarding the Ignition.

Whether there is any real necessity for advancing or retarding the point of ignition, is something upon which there is a great diversity of opinion, and the fact that there are well-known motors on the market which show a high degree of efficiency with a fixed point of ignition, merely providing a slight amount of retardation for starting purposes, serves to illustrate that there is sufficient ground for more than one well-founded conviction. It is a subject upon which volumes have been written and a great deal is being added to the discussion constantly. One fact has been pretty well established, and that is that the influences which make for the necessity of shifting the point of ignition are entirely alien to the motor itself, or at any rate, practically so. They are altogether electrical or mechanical reasons, such as magnetic lag of the iron core of the primary winding of the coil, inertia of the trembler, or of the parts of the make-and-break type of ignitor, and the like. The intention in the present article is merely to show what extremely important factors these seemingly trivial things are, and not to go into the technical side of the question as above outlined.

In order to make matters clear to even the novice, the illustrations are arranged to show the relative positions of the controlling lever and the crank, as well as their intermediary, the timer, which governs the point at which ignition shall occur with reference to the travel of the piston. In Fig. 6 is shown what may most aptly be termed a negative point. That is, the crank

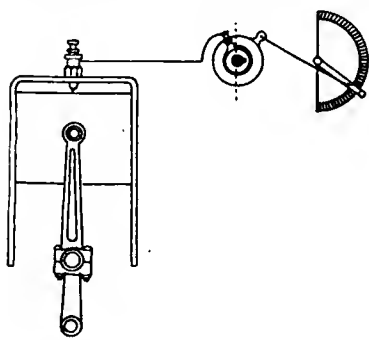


FIG. 6.

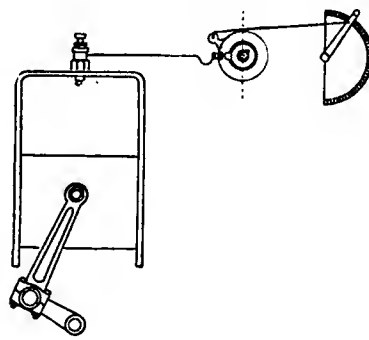


FIG. 7.

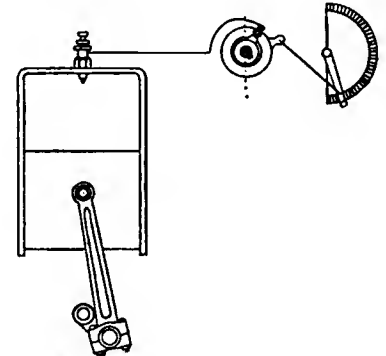


FIG. 8.

and the piston would pass the dead center and travel downward on the power stroke. Before reaching the end of the latter, the exhaust cam would begin to lift the valve, as shown in Fig. 4. The necessity for this will be apparent when it is borne in mind that even at the end of the stroke the pressure in the cylinder would be quite high were it not relieved in this way. The object sought is to reduce this to atmospheric or less before the opening of the inlet valve, as the fresh charge cannot enter the cylinder unless this is the case. With the relative proportions given the standard automobile motor arising from space restrictions of the car—that is, the necessity of making the stroke but little longer than the bore in order to achieve lightness and minimum weight—it is impossible to expand the charge down to anything like atmospheric pressure as is done in stationary engines in which, as already mentioned, it is nothing unusual to make the stroke twice the diameter of the bore. Hence the exhaust valve must begin to open an appreciable distance before the end of the power stroke, varying with the speed at which the motor is designed to run.

This brings the sequence of operations to the last part of the cycle. The exhaust starts to lift from its seat before the crank reaches the lower dead center, as shown in Fig. 4, and for reasons already dwelt upon, it begins to close at a point which represents about an equivalent length on the crank circle before the termination of the upward or exhaust stroke, in order that its final closing may coincide or slightly precede the opening of the inlet valve on the beginning of the next cycle of operations immediately following it.

is on its upper dead center, corresponding to the neutral position of the controlling lever on the sector above the steering wheel. At this point, the ignition is neither advanced nor retarded; the spark would occur at the moment the piston reached the upper limit of its travel. That is, theoretically speaking, the influences already referred to would probably make it necessary to advance the lever quite a few degrees, varying with the speed of the motor to make the ignition occur at this particular point, but for the purposes of the illustration these are not taken into consideration. This position of the lever is that which the driver becomes accustomed to regard as the safest for starting. There is no fear of a back-kick, and at the same time, the ignition is sufficiently advanced for the first explosion to be sufficiently powerful to spin the motor and cause the remaining cylinders to take up their cycle.

In Fig. 7, though the lever is not shown quite to the end of the sector, this represents about the extreme point of advanced ignition, practically 45 degrees on the crankcircle. This is an extreme that is possible with a very high-speed motor, but advancing the ignition to such a point is something that is rarely done and would be more apt to retard the speed of the average motor than otherwise, if not to stop it altogether. The sole object of advancing the point of ignition is to produce the maximum force of the explosion at the beginning of the power stroke. The rate of flame propagation under compression is incredibly high, the maximum initial pressure in the cylinder being attained within a few hundredths of a second after the moment of ignition; nevertheless, it is not so high but that allowance must be

made for the time required. To realize this, it is only necessary to refer back to the figures given with regard to the amount of time required to complete a revolution or a stroke in the case of a motor running at 1,200 r. p. m., which is far from excessive, many motors such as those used in motorcycles running at 2,200 or over, while automobile motors are often designed to run at 1,500 to 1,800, which is not an extreme by any means. In consequence, though it takes but a few hundredths of a second to burn the charge, in that period of time the piston can have traveled an appreciable distance on the downward stroke, thus considerably weakening the effect of the explosion.

In Fig. 3 the extreme reverse is shown, the time of ignition being retarded practically to a point where the exhaust valve is about to open. The proper point for both ignition and valve opening to occur is usually found by taking indicator cards from the engine until positions giving the best results are shown. In a case such as that illustrated by Fig. 8, the card assumes a shape that may be likened to the outline of a club, with the large end where the termination of the expansion in a proper card usually comes, thus showing that ignition and in consequence the rise in pressure did not take place until the piston had almost terminated its stroke, the quick drop showing that the exhaust valve opened immediately afterward. Under such conditions, the motor would develop practically no power and by far the greater portion

of the charge would issue from the exhaust unburned and would burn in the muffler. However, some of the old-time motors with automatically operated inlet valves could not be run at a slow speed in any other way.

To sum up, the standard automobile motor of the present day runs at speeds second only to those employed in small electric motors. It is, technically speaking, a high-speed motor, but its r. p. m. rate is very greatly in excess of anything that has been considered good practice in steam engineering in connection with the reciprocating engine, except in very small units for special purposes. Further, its working necessitates a greater number of operations involving moving parts than any other similar piece of machinery, and the rapidity with which they take place in a motor running at full speed is utterly beyond the human mind to grasp. A speed of 2,000 r. p. m. means that the piston completes 4,000 strokes in the course of 60 seconds; the inlet and exhaust valve each open and close 1,000 times; 1,000 charges are drawn in, compressed, fired and exhausted, all in the space of one minute. Even at half the speed mentioned, the mind fails to conceive the meaning of the time required for each operation; it is difficult if not impossible to realize what a hundredth of a second means. Hence, the necessity of timing the valves to the veriest nicety to produce the maximum efficiency from a given design of motor.

A DEVICE TO EQUALIZE CARBURETER PRESSURES

FROM MOTOR (LONDON).

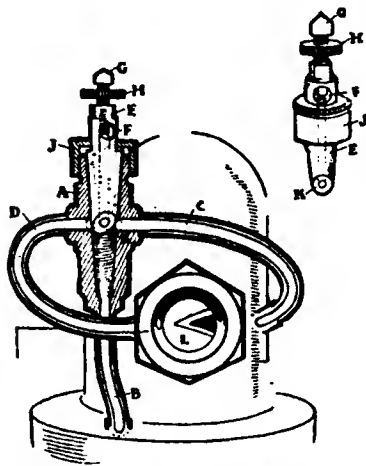
TO reduce the carbureter to its simplest form by restricting it to a single jet, a single air-inlet and a single method of control is the object of an invention of Messrs. Gillet and Lehman, to which has been given the title of a "controller." Experiment has shown that the incoming column of air can travel at such a speed that sufficient to properly oxygenate the charge can enter at the main inlet of the carbureter as at present constituted without the need

of any other orifices.

Then, the jet being properly proportioned to the engine capacity, it is obvious that a single source of fuel supply is ample. The throttle in the induction pipe virtually rarifies the air and the charge becomes attenuated; theoretically, this attenuation should act on the air and the gasoline alike, but in practice it does not do so, owing to the variation in pressures in the carbureter. At high speed the pressure in the intake falls to approxi-

fast. Theoretically, the action of this inlet should be instantaneously suited to every stroke of the engine—something practically impossible. The Gillet-Lehman device provides properly proportioned communication from the induction pipe to the float chamber, the disturbing variation caused by the throttle being offset by taking one of the balance pipes from either side of the throttle. Thus each stroke of the engine acts instantaneously on the pressure in the float chamber, proportioning the flow of fuel to the draught of the intake.

The device consists of a sort of three-way valve in the shape of a tapered plug; complete it measures but a few inches over all. It is designed to be tapped directly into the top of the float chamber, which must be made airtight with a gasket or washer under the cover, but in the case of the De Dion carbureter shown there was not sufficient room to apply it in this manner, and a small piece of tube B was used. Branching off from the center of the device are the "balance" pipes, both of which are led to the intake C at the jet side of the throttle D at the engine side. The taper plug E, which is hollow down through its center, and has a transverse hole F across its top, has two functions. A screw G controls the opening of F, and is locked by H. The plug E is clamped in position by the cap J. Air entering through F opens communication between the float chamber and the atmosphere. The second function of the plug is to act as an adjusting valve, controlling the opening of the orifices of the pipes C and D. Being cut on an angle, the end is the frustrum of a cone, and, in preparing to adjust the device to an engine, the plug is set so that it closes one-half the opening of each pipe. Then, if turned to the right, it increases the size of the opening of D and decreases that of C; turning to the left opens C and closes D, the relative proportions of the openings of the two pipes thus being varied to suit the engine. L is the sleeve throttle of the De Dion carbureter. A cap is made to screw over the device, completely encasing it, and may be sealed if desired. Assuming the device to be in place on an engine, it is adjusted as follows: F must be open in order to start, as otherwise the fuel could not flow; turning it sufficiently to permit the engine to run normally is the first adjustment, and G can be locked. Should closing F not stop the engine, air is leaking into the float chamber. The plug is turned until the engine misfires at slow speeds and then opened until the engine runs well, turning over slowly. The plug is then locked and the car tried, the adjustment being varied until satisfactory.



SECTIONAL DIAGRAM OF DEVICE.

mately thirteen pounds to the square inch; when entirely closed, the pressure between the throttle and the engine would fall further, probably as near to a vacuum as the tightness of the throttle and the pressure of the valve springs would allow. But in the jet chamber it would still be approximately atmospheric, from which it will be evident that the pressure on either side of the throttle is constantly varying, only being alike when it is wide open and furthest apart when tightly closed. However, the pressure on the fuel in the float chamber has remained constant at atmospheric, from which it is apparent that frequently the supply of fuel must be out of all proportion to the requirements. To overcome this, what is usually known as an auxiliary air-inlet was introduced a few years ago, its purpose being to equalize the pressure on either side of the throttle when the engine is running

EFFECT OF THE CHARACTER OF THE SPARK*

By W. WATSON, D.Sc., F.R.S.

THAT a strong or "fat" spark is better than a weak one, when used to ignite the charge in a motor, appears to be a commonly accepted opinion, while there can be no doubt that in the case of most engines the power developed is considerably greater when the voltage of the ignition battery is well up to its normal value, than when the battery has run down, although the engine continues to fire regularly. Not feeling satisfied as to the cause of the above, and not being able to find the record of any direct experiments, the author has made the measurements recorded below.

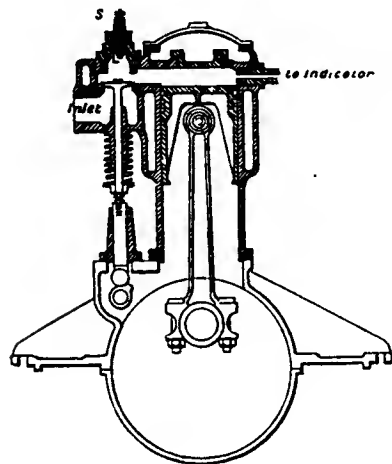


FIG. 1.

The engine employed is a double-cylinder one having a bore of 3.5 inches and a stroke of 4 inches. The inlet valve is mechanically operated, and both valves open into a pocket on one side of the cylinder head, as shown in Fig. 1. The sparking plug S screws into the cap used to close the hole over the inlet valve, the spark points being well inside a recess in this cap. All the experiments were made on one cylinder only, the other cylinder working with the trembler coil ordinarily employed with the usual four-volt battery. The speed at which the engine was run varied between 950 and 1,000 revolutions per minute. The primary of the coil used to fire the charge was connected to a commutator on the two-to-one shaft, a battery of ten volts, an adjustable resistance, and an ammeter. The commutator used was either a wipe contact, consisting of a steel wheel and fiber cylinder carrying a brass strip, or a make-and-break igniter.

The reason why a fat spark improves the working of an engine may be either (1) the development of a greater pressure in the cylinder owing to the quicker ignition of the charge, or (2) the more regular firing produced by the timing of the spark being more uniform. Experiments using a trembler coil at once showed that when the current in the primary of the coil is reduced, the

time of firing is delayed, but that on advancing the spark more than usual, the mean pressure during the stroke can be brought back to the value obtained when the usual current is employed. As this indicated that the delay might be caused by the coil, the ordinary wipe contact was replaced by a make-and-break contact, while the trembler coil was replaced by a non-trembler one. As a result the delay, which with the trembler coil took place when the current in the primary was reduced, no longer occurred, this point being illus-

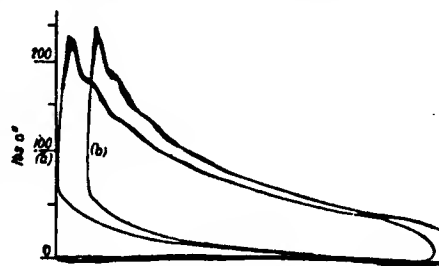


FIG. 2.

trated in Figs. 2 and 3. In each figure the indicator diagram (a) is taken with a strong current in the primary of the coil, and that marked (b) is taken with such a weak current that any further reduction in strength is followed by entire cessation of firing. It will be observed that the timing and the pressure developed are the same in either case, except that in Fig. 3 (b) an explosion has been missed, owing to the spark failing to pass, and the next explosion is much more violent than usual, owing to the scavenging which took place during the idle stroke.

In Fig. 2 the sparking points were .25 mm. apart, and in Fig. 3, .5 mm. Diagrams were taken with the sparking points at .25, .5, and 1.0 mm. apart, but as no difference was obtained, only diagrams for a sparking distance of .5 mm. will be given in most cases.

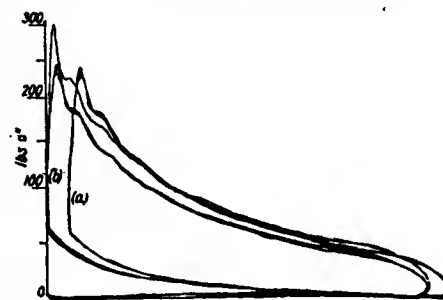


FIG. 3.

In Fig. 4 is shown the corresponding pair of diagrams when the mixture is very weak, a large excess of air being used. Here again, with the exception of some abnormal strokes following miss-fires, there is no effect produced by reducing the in-

* Abstract of a paper read before the A. C. G. B. I.

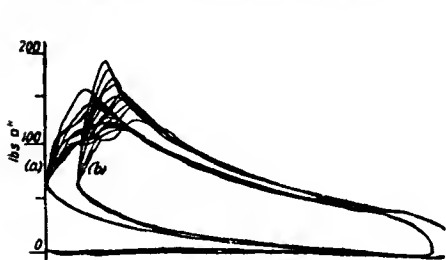


FIG. 4.

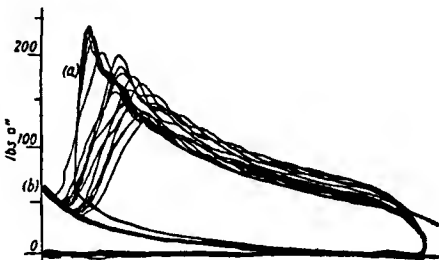


FIG. 5.

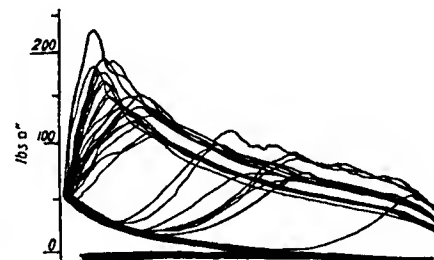


FIG. 6.

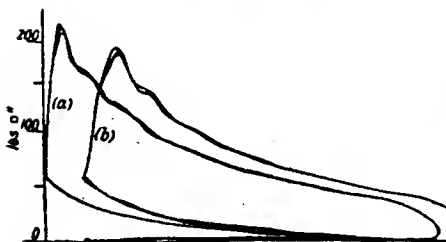


FIG. 7.

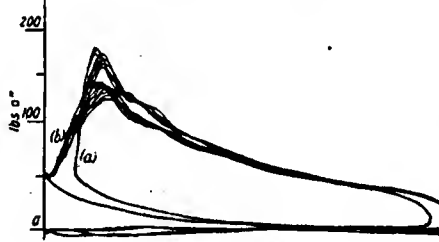


FIG. 8.

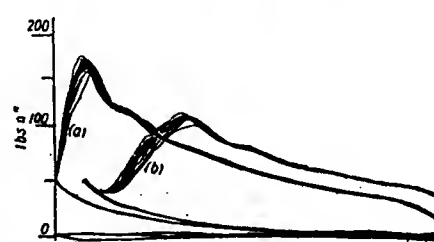


FIG. 9.

tensity of the spark. The above experiments indicate that it is not the weakness or "fatness" of the spark—at any rate, in this engine—which causes the loss of power that occurs when a trembler coil and a weak current are used. The kind of effect which is obtained with a trembler coil when the current is reduced, the carbureter being adjusted to give the best mixture, which for shortness may be described as a "full mixture," is shown in Fig. 5. In Fig. 6 the irregularity which may occur when a weak mixture is employed is shown, the diagram obtained with the normal current being omitted for clearness. It will be observed that the maximum pressure occurs at all sorts of points of the stroke between the normal and about 4-5 stroke.

The delay which occurs when a weak stroke is used with a trembler coil may be due to sluggishness of the trembler or to the fact that the trembler fails to act, the spark which ignites the charge being produced when the current in the primary of the coil is broken at the wipe contact. The delay which may be produced by lag of the trembler is shown in Fig. 7 for coil A and in Fig. 8 for coil B, and it will be seen that although the delay is appreciable the amount is quite regular, so that all the

spark length in air was in this case 0.3 mm. The mean *I. H. P.* for four cards for each arrangement, taken alternately, was the same within the limits to which the diagrams could be measured; the fact that the speed of the motor was unaltered by the change in spark also indicating that the power developed was the same whether a large or small spark is employed.

From the results of the above measurements it would appear that the trembler, although it undoubtedly is an advantage when starting, is apt to introduce very considerable variations in the point of the stroke at which the charge is fired. Hence, on this account a plain coil with a make-and-break is to be preferred, particularly in the case of multi-cylinder engines having separate coils for each cylinder. The ill effects of the trembler will also be felt when a single coil with a high-tension distributor is used unless care is taken to keep the electromotive force of the battery well above the value required to give the critical current below which the trembler ceases to act. There is one disadvantage in the make-and-break, besides that due to the loss of power of starting on the switch, namely, that with some forms, unless the adjustment is just right, the blade may act as a trem

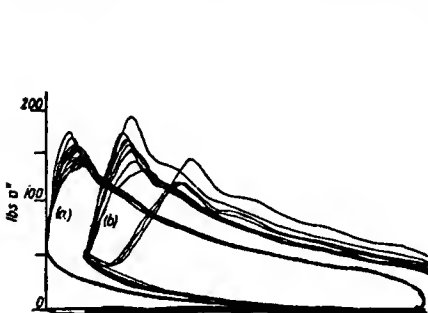


FIG. 10.

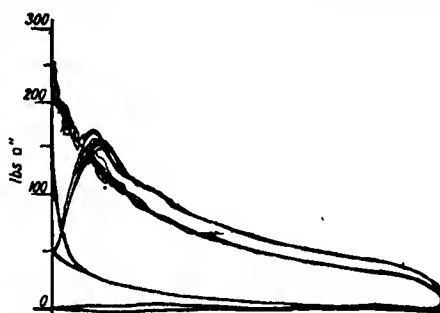


FIG. 11.

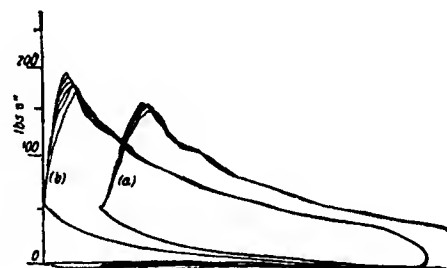


FIG. 12.



FIG. 13.



FIG. 14.



FIG. 15.

explosions occur at the same point in the stroke, and so the effect of the delay could, in the case of a single coil, be eliminated by slightly advancing the spark. As the current actuating a trembler coil is gradually reduced there is at first a small lag, such as that shown in Figs. 7 and 8, due to lag in the trembler, and then there is a sudden great increase in the lag. This increase is due to the trembler ceasing to act, so that the spark, in place of occurring shortly after the primary circuit is completed at the commutator, does not take place until the current is interrupted at the contact. When the current is below the critical value, holding the trembler against the upper stop produces no effect on the timing of the spark, showing that the trembler has really ceased to act. The change in current which at the critical value is required to pass from the state when the trembler acts to that in which it fails, is very small, in most cases less than a tenth of an ampere. Figs. 9 and 10 show the diagrams obtained with coils B and C when the current is first just above, and in the second case just below, the critical value.

That the size of the spark has no effect on the power developed was further shown by taking a number of indicator cards in which coil B was used, and the current in the primary was adjusted so that (a) the mean current was 0.6 ampere and the equivalent spark length in air was 5.1 mm., the trembler of the coil acting, and (b) when the current was reduced to 0.3 ampere, the trembler no longer acting, but the delay caused by the fact that the spark is now produced when the commutator breaks, the current being compensated by advancing the spark lever. The equivalent

bler, giving a spark before the cam on the engine shaft finally breaks the circuit, so that pre-ignition is produced. This effect is shown in Fig. 11.

Since the power developed is not improved per se by the use of a "fat" spark, there are many advantages in using a coil which only gives a comparatively small spark, so long as the working of the coil is regular, for such a coil can be designed so that it only consumes a small current. The advantages of a small current are that, in addition to the economy in current, a point of importance where facilities for charging accumulators are not at hand, the wear on the points where the current is interrupted, due to sparking, can be reduced to a vanishing point. Thus, with a trembler coil the trembler, or with a plain coil the points of the make-and-break, need seldom be touched. The author feels confident that by suitably designing the coil and the commutator absolutely regular firing can be produced when the mean current does not exceed a tenth of an ampere.

To show that a fat spark, and hence a large current consumption, does not necessarily imply a good coil, a comparison was made between coils B and C, coil B being that which gave the fattest spark, and C that which gave the thinnest of the three coils tested. The two coils were so arranged that by means of two switches either coil could be used at will, and the current was adjusted in each case to the smallest value at which the coil would give regular firing. The results of the comparison are shown in Figs. 12 and 13. Fig. 12 shows the diagrams obtained with a full mixture, and Fig. 13 those obtained with a weak

mixture. In either figure diagram a is that obtained with coil B, the mean current being .6 ampere, while diagram b is that obtained with coil C, the mean current being .15 ampere. It will be noticed that coil C fires more quickly than coil B, probably owing partly to having a lighter trembler, and partly to the fact that its time constant is smaller.

The two diagrams shown in Figs. 14 and 15 are somewhat outside the scope of the paper, but may be of interest to drivers. They illustrate the advantage, as far as economy is concerned, of advancing the spark more than usual when employing a very weak mixture—that is, when driving with the extra air valve as far open as possible. Fig. 14 is that obtained when the spark is as much advanced as is advisable when using a full mixture, and the *I. H. P.* at 1,000 revolutions is 2.36. In Fig. 15 the spark has been considerably further advanced, so as to allow for the slow burning of a weak mixture, and as a result the *I. H. P.* at 1,000 is 2.76, an increase of nearly 17 per cent. in power, the consumption of fuel remaining the same. Something that will probably come in the nature of a surprise to the average driver.

SOMETHING ABOUT MOTORCYCLES.

Magneto Ignition for Motorcycles.—A strong tendency revealed at the recent European automobile shows was the adoption of magneto ignition for motorcycles. Almost every French and German manufacturer now fits a low tension magneto either as a part of the regular equipment or as an extra. In England the same tendency is observable, though in a rather less degree. The position of the magneto on many of the best European machines, among them Alcyon and Werner, is between the crank case and the front wheel, with drive by bevel gears. On the Werner, for instance, two small bevel wheels are fitted, one on the end of the magneto shaft and the other on the end of the half-time shaft, which crosses the front of the crank chamber. The two small bevels are then connected by means of one large bevel wheel. Another prominent French machine has the magneto placed transversely across the frame, between the lubricating oil and gasoline tanks. Even the very smallest light-weight French motorcycles, machines with a 1 1-4 horsepower engine, have the magneto as a part of their regular equipment for 1907.

Starting a Magneto-Equipped Motorcycle.—Replying to a correspondent who had experienced trouble in starting his motorcycle fitted with Simms-Bosch magneto, *Bicycling World* says that two matters should always be borne in mind. First, the spark plug contacts must be very near together. Secondly, the lever which advances and retards the spark must be in such a position that the break in the electrical current is made when the current reaches its maximum strength. In regard to the first point, it is allowable to have the spark plug points in magneto ignition very close, because that system gives a much better and stronger spark than with batteries; and that the advantages of a short spark gap are that it takes less voltage or potential to jump a short gap and will not short circuit with oil or soot as readily as when there is a long sparking distance. To get the best adjustment, put the rear wheel in a stand so that it may be pedaled. Disconnect the magneto wire which runs to the spark plugs and arrange a circuit so that there will be a spark gap between the high-tension magneto terminal and the frame of the machine equal to 1-8 or 3-16 of an inch. Mount and pedal at a uniform speed, shifting the lever at the same time until the hottest spark is obtained at the gap. Note this position of the timing lever, as it is here the maximum current is obtained, and always put it there in starting. In most machines the proper position is about three-quarters of the way towards highest speed. After the machine is started the spark may be retarded if desired.

BOOKS FOR AUTOMOBILISTS.

Baudry de Saunier's Annual.—Automobilists who have any connection with the trade in France or who are occasionally in need of information on events, men, firms, products, or expressions in the land of the automobile, will find the Annual Baudry de Saunier for 1907 a most valuable volume. The work is a kind of annual automobile encyclopedia of over one thousand pages arranged alphabetically for easy reference, and covers every phase of automobiling and the automobile industry. Should the reader wish to know the meaning of a certain technical expression, the address of some person or firm in the automobile business, particulars of the life of a speed king, the winner of a certain race, the names of tire or other manufacturers, etc., all that is necessary is to turn up the letter in the annual and full information, with drawings where necessary, will be found. The volume is carefully compiled, is brought up to date each year and is fully reliable in its information.

As an Aid to the Understanding of Electricity the automobilist will find "Electric Ignition for Motor Vehicles," by W. Hibbert, A.M.I.E.E. (Whittaker & Co., London) of very great value. The book contains the substance of a series of lectures to automobilists and deals with actual questions asked at these lectures. The elements of electricity are made clear, and the reader is introduced to the practical application of electricity on internal combustion engines. Batteries, commutators and coils, magnetic fields, multi-cylinder engines and synchronous ignition, faults, and magneto methods of ignition are all treated in a clear, concise manner and in such a way that even the novice cannot fail to obtain a good grasp of the subject. The chapter on magneto methods of ignition is thoroughly up-to-date, and deals with the principles involved and their practical application in Eisemann, Simms-Bosch and other well-known magnetos.

A New Question and Answer Book.—Compiling a book on the automobile in the shape of a catechism of stock questions and answers is an old idea borrowed from other fields and that has been made to do yeoman duty in this. A pleasing variation of it is to be found in the little volume just issued by the Gas Engine Publishing Company, Cincinnati, under the title of "Questions and Answers from the Gas Engine." The questions have not been formulated by the editors, but have been asked by progressive readers, and relate to the design, repair and maintenance of all kinds of gas and gasoline engines. They have been answered by recognized authorities, and from the great number which have appeared in the past eight years only those have been retained which are considered to have a permanent value.

Industrial Alcohol; Its Manufacture and Uses.—Under this title Munn & Company have just published a practical treatise on a subject which is at the present time occupying a great deal of public attention. It is written by John K. Brachvogel, M.E., and covers the making of alcohol thoroughly from the raw material to the final rectified product, besides containing numerous chapters on timely matters in connection with its use, such as the importance of tax-free alcohol, methods of denaturing, its utilization for light, heat and power, a statistical review and the Federal law on the subject in full.

A Twentieth Century Hand Book.—Under the title of "Henley's Twentieth Century Book of Recipes, Formulas and Processes," the Norman W. Henley Publishing Company has just issued a handy volume containing information of value to those in almost any industry. It has been compiled by Gardner D. Hiscox, M. E., from the most authoritative sources to be found in each branch, and the information is set forth in such a manner as to make ready reference to everything pertaining to a certain subject available without tedious search.

HOW THE TAXIMETER TELLS ITS TRUTHFUL STORY

In most European capitals the taximeter has entered into the daily life of the people and removed all cause for dispute between passenger and cab driver. In Paris, where the taximeter was first employed, every public vehicle, whether automobile or horse-drawn, is equipped with this trouble-saving apparatus.



FRONT VIEW SHOWING AMOUNT OF FARE.

same liberty as is now enjoyed by Parisians and Londoners.

The accompanying illustrations will familiarize readers with the instrument which, once fitted on either horse or automobile cabs, will inevitably be adopted by every public vehicle in the city. The taximeter here shown is probably the only one at present in New York. It was made specially for service in this city and imported by the De Barres Auto Company, 589 Park avenue, where it is used on a 12-horsepower Delahaye cab of the type commonly employed in Paris and London. Though not plying for service, the cab has been running on New York streets for a few weeks, and its metal box surmounted by an American flag has excited interest and curiosity.

The face of the apparatus has four sets of figures—in the top left hand corner appears either tariff 1, tariff 2, or "Panne," the French word for a breakdown. Below are two openings, showing in dollars and cents the fare to be paid. At the foot of the indicator are registered the extras. The minimum fare is

50 cents, and this sum is always indicated whether the vehicle is in service or not. When a passenger enters the cab the driver lowers his flag and the machine begins its silent but unflinching task of measuring the distance traveled and indicating on the dial the fare to be paid. This is performed in much the same way as speed and distance are measured by a speedometer, a flexible cable connecting from the indicator to the front wheel of a motor-driven vehicle or the rear wheel of a horse cab.



REAR OF TAXIMETER IS A TOTALIZER.

In one important particular the taximeter differs from a speedometer. For instance, should the cab be stopped either for a block in traffic or for the making of a call, a clockwork mechanism within the apparatus advances the figures at regular intervals, making the cost the same for a given time whether the cab be running continuously or intermittently. Experiments have been made with the Delahaye taximeter cab over different routes in New York, each one being accomplished at various rates of speeds, straight running, or intermittently fast and slow, the result being that the fare for a given distance was always the same no matter how that distance had been covered, provided the speed had not fallen below five miles an hour. Four runs were made from the Café Martin to Park avenue and Sixty-third street, one at high speed, another at a moderate speed and a third alternately fast and slow to suit traffic conditions. The average time for this run was then taken and the taximeter set in motion by lowering the flag, the auto not moving, for this period. All four fares were practically the same. It is useless to give figures, for no definite tariff has yet been fixed upon for a New York service.



TAXIMETER CONNECTION TO WHEEL.

All that the passenger has to concern himself about are the figures on the dial. On leaving the vehicle he pays the amount indicated. If more than two people enter the cab the driver turns tariff 2 into view, this registering a minimum 50 cents fare for a shorter distance. Should he be asked to go out of a certain defined district, as, for instance, above One Hundred and Twentieth street, over the Hudson or the East River, the driver will, before starting, indicate the extras to which he is entitled according to a fixed tariff, by operating a push button at the rear of the apparatus. If the machine has a temporary breakdown, the driver turns his tariff square over to "Panne" during which time no change is made on the fare dial, though the amount of time thus lost is indicated on the rear of the apparatus. The repair finished the driver turns his tariff back from Panne to tariffs 1 or 2, as before, and the journey is resumed as if nothing had happened. On the completion of the journey he raises the flag, the extras turn back to zero and the fare dial again registers the minimum of 50 cents. The total distance traveled with the taximeter in operation, the total for extras and time spent making repairs while on a journey are all shown at the rear of the apparatus, and serve as a check between the driver and the company owning the vehicle. A profit-sharing system is generally adopted between driver and owner.

From advice received from London it appears that the metropolitan cabby, who a few weeks ago was denouncing the taximeter as an infernal machine, is now thoroughly converted to its value, for, although under no legal obligation to do so, he is having his vehicle equipped with the instrument. Automobileists declare that this sudden enthusiasm is but a cute move to buy up all the instruments on the market and thus keep the automobile cabs off the streets for a little time longer.

LETTERS INTERESTING AND INSTRUCTIVE

The Gearless Car Again Specifically Considered.

Editor THE AUTOMOBILE:

[639.]—Has there ever been built a real gearless gasoline automobile—one in which there is no change-speed gear nor any equivalent means for varying the rotational ratio between the motor and the driving wheels? If not, how nearly has this ideal been approached in practice, and what is the best engineering opinion as to its ultimate complete realization?

Spokane, Wash.

JOHN C. PERKINS.

Several years ago a prominent French automobile manufacturer built a car propelled by an eight-cylinder engine without gears, except for reversing, but this car never was run enough to demonstrate any really practical qualities. Since then the Napier people, of England, and the Oldsmobile concern, in this country, have achieved some remarkable runs solely on the high gear—which amounts to a substantial equivalent of the gearless ideal, while the Napier people are understood to offer their six-cylinder cars, optionally, without change-speed gear. Of equal, if not of greater significance, as showing the tendency towards gearlessness, is the practice of the Ford company, which makes a six-cylinder touring car in which the drive is through a two-speed planetary gear affording on the low gear only double the engine revolutions that are provided for a given speed on the high. This can mean nothing less than that if the flexibility of present engines could be merely doubled—by no means an impossibility—a car could run gearless quite as well as the Ford runs with its two-speed gear. And it is a fact that the Ford, while expected to run ninety-nine one-hundredths of the time on the high gear, is no more subject to "stalling" than any modern car of similar weight and power. The whole question resolves itself into one of gasoline-engine flexibility, and a very little progress in this direction may bring about the elimination of the speed changes from many cars. How soon this progress is to come is another question, there are many very serious difficulties in the way of it, but more serious difficulties have been overcome. Without going into a more lengthy discussion of the subject than is pertinent to the purpose of this page, it may be said that the matter is one of torque range rather than of speed range. Engines now are made that will *run* as slow as 100 and as fast as 2,500 revolutions a minute, but an engine that will *pull* at all speeds from 150 revolutions to 2,000 revolutions will solve the change-speed-gear problem. Some interesting material on this subject will appear in the course of a series of articles on some trends of modern automobile design.

The Prevention of Carbon Deposits.

Editor THE AUTOMOBILE:

[640.]—Will you kindly tell me under the head of "Letters Interesting and Instructive," the best way to prevent carbon deposits from forming on the cylinder heads and pistons of an automobile motor? I am careful to use the proper mixture of gas, as well as good oil and not too much of it, but the carbon forms just the same.

Baltimore, Md.

SUBSCRIBER.

It is difficult to add anything to such a general statement as you make. By using the correct mixture and the proper quantities of the right sort of lubricating oil, you are doing practically the only things that can be done to prevent the formation of carbon, but you do not throw any light on the extent to which you are troubled by the latter. It is usual to run a motor for an entire season without any undue trouble from this cause, such as pre-ignition, while others, with apparently an equal degree of care, require cleaning much oftener. If you will describe your trouble more in detail it may be easy to suggest a remedy, or probably some other autoist who has had exactly the same experience may be able to come to the rescue and help you out.

More About Wiring Dry Cells for Auto Use.

Editor THE AUTOMOBILE:

[641.]—In your answer to Mr. Stark, of Concord, N. H., in "The Automobile," issued February 21, 1907, you state that with a battery of ten cells connected up in two groups of five cells, he (Mr. Stark) would "get the voltages of five and the amperage of ten cells." Now, I claim that you would get the voltages of five and the amperage of two. Consider ten cells as above, but connected in parallel, that is, positive to positive and negative to negative. You would, of course, have the voltage of one cell and the amperage of ten; that is, the effect would be the same as if we had one cell of ten times the electrode surface, that is, 1-10 of the internal resistance; and on a short circuit, or circuit of low resistance, we would obtain approximately ten times the amperage or quantity of current.

Again, consider the same ten cells arranged in two groups of five each. In this case we have the voltage of five, as five cells have been joined in series, positive to negative, and the quantity of two, for the electrode surface is doubled, that is, the internal resistance is halved, so on a circuit of low resistance the current (amperage) is doubled. To produce an amperage ten times as great as one cell would require ten cells connected in parallel, and to produce a voltage five times as great as that of one cell would require five cells connected in series, so that to produce a voltage of five and amperage of ten would require fifty cells connected in series—parallel ten groups of five each.

Lowell, Mass.

A. R. BLISS.

Upon referring to the letter you mention, though the diagram submitted in connection therewith is no longer available, it is evident that our correspondent was somewhat in error in stating the output of his dry cells, and this error was inadvertently repeated in our answer. It should have read in both cases as "the voltage of five and the amperage of two cells," instead of ten, the makers of the car in question equipping it with twenty cells wired in two series-multiple connected sets, so as to give the voltage of five cells and the amperage of two on either point of the two-way switch. Your statement of the case is quite correct, and we are gratified to note the readiness which our correspondents display in detecting such oversights.

Simplification of Screws and Nuts.

Editor THE AUTOMOBILE:

[642.]—I have a suggestion to make, as from a user to the builders of cars, on which I would like your criticism. Take the average car, even of best quality, and it is a recognized fact that it is in at least some degree subject to breakdown on the road, as often as not involving the repair, replacement, or transference of some bolt or nut. Usually, however, there are not in the tool box bolts and nuts of every size used on the car, since this would involve carrying too many. And the other emergency means of extemporizing a repair—by the removal of one of these small but vital holding elements from an unimportant to an important point—is usually blocked by the same fact that makes carrying a complete set of replacements impracticable—the variety is such that the ones to be had do not fit. Now why would it not be well to reduce this variety and build a car with, say, absolutely no more than three different sizes of bolts and nuts in its whole construction? Would this involve anything more serious than the occasional use of a nut, for instance, considerably large for the stresses to be sustained by it, but not enough so to be really objectionable in point of weight, size, or otherwise?

Kenosha, Wis.

LAWRENCE B. CLAFLIN.

Your suggestion undoubtedly is one of great merit, and if it could be brought into vogue with the manufacturers of the leading cars, there is no doubt but what it would greatly facilitate repairs of all kinds, not only by facilitating "robbing" of one car or part to fix up another, but also by reducing the variety that the average small repair shop would have to stock. In the new standard adopted by the Association of Licensed Automobile Manufacturers for "Hexagon Head Screws" and "Castle and Plain Nuts" there are eleven sizes included—1-4, 5-16, 3-8, 7-16, 1-2, 9-16, 5-8, 11-16, 3-4, 7-8, and 1 inch. To reduce these to the three you suggest there

might be retained only the 3-8, the 11-16, and the 1 inch. This would involve the use of nothing smaller than 3-8, even in cases where the 1-4 or 5-16 might fulfill all strength requirements. Likewise, for anything requiring greater strength than the 3-8 would afford, the 11-16 would have to be used, even if excessively heavy for the duty required of it. And the 1 inch would have to be used arbitrarily in place of the present 3-4 and 7-8 sizes. Probably, everything considered, four sizes would be better than three, but this is a mere minor detail, and it is a fact that there is less occasion than might be imagined for the greater variety. A car with only three—or four—bolt sizes would be almost ideal in this respect, and if the manufacturers have any really sound reason for not building it, now that the suggestion has been made, these columns are open to their opinions, which we all will await with interest.

The Control of the Emergency Brake.

Editor THE AUTOMOBILE:

[643.]—Which is at present the most approved practice, to have emergency-brake levers apply by forward or backward movement? And what are the advantages of each system?

Juarez, Mexico.

ENRICO GOMEZ.

There seems to be somewhat of a preponderance in the case of the most-expensive and presumably best-designed cars in favor of the rearward movement to apply, so that the driver pulls the brake lever towards him to stop the car. Apparently, however, the difference is more a matter of individual preference than of anything else, since there are those who believe strongly in and argue vigorously for each construction. Drawing the brake towards one is claimed to be, and in a manner seems to be, the natural movement, since with it the feet can be braced against the toeboard, or the clutch and foot-brake pedals. On the other hand, if the forward movement is adopted, the brake lever always is in most convenient position to grasp without leaning forward or groping, while it is further claimed that the shock of sudden stopping—the condition for which the emergency brake is supposed to be used—throws the driver forward against the brake lever, and in this way applies it the harder.

A Puzzling Carbureter Ailment.

Editor THE AUTOMOBILE:

[644.]—As a subscriber in your excellent weekly, I appeal to your columns for a bit of advice. I have a 11-4-inch Schebler carbureter on my 20-horsepower, four-cylinder runabout, which has never quite given me entire satisfaction. The engine, when running at slow speeds in a closed throttle and retarded spark, misses fire in a very erratic manner. No particular cylinder is always responsible, but it ekips about with all of them taking their turns at misfiring—the two end ones more often offending. After a vain attempt to eliminate the trouble by carbureter adjustment, I turned my attention to the ignition. I replaced my old wires with new Packard cable throughout; installed a new set of plugs; cleaned the contact points on the timer; carefully inspected the vibrators, assuring myself that they were in perfect condition; had my storage cells recharged, and even tried new batteries, but still with no improvement. Satisfied with the condition of the ignition system, I next took down the carbureter and cleaned it out thoroughly. With the other debris which had lodged at the gasoline inlet, I removed the body of a large fly, and my hopes ran high that I had located the trouble at last.

But still the engine behaved as before. When pulling the car at all speeds from twelve miles per hour to the maximum she acts splendidly, each cylinder hitting as regularly as the clock. In fact, the car is a little wonder on the road, and answers the throttle with remarkable celerity.

But immediately I begin to reduce the speed below twelve—which necessitates closing the throttle entirely and retarding the spark—the misfiring recommences and the machine is often propelled in jerks.

I have spent three months trying to adjust that carbureter properly. If I arrange it so that the engine will hit regularly at the slowest speed, it will not race, for lack of sufficient air; and when the needle valve and air intake are adjusted for high efficiency at the maximum speed (1,400 revolutions), as I now have it, she absolutely will not fire steadily at the other extreme.

This is particularly obnoxious when on a crowded thoroughfare. When it becomes necessary to drive behind a file of ice wagons moving at a snail's pace my engine endeavors to amuse me with a horseless imitation of an amarillo broncho bucking along on one, two, or three "legs."

I would like to have some advice from your valuable paper upon a means of correcting this fault. Is it not possible to secure a richer mixture at slow engine speeds by raising the float level in the carbureter? My idea is that with a higher level a less amount of suction is required to draw a proper amount of gasoline from the nozzle. Do you think this change would help me? I had thought, too, of partially closing the main air intake hole. As you know, this stands open permanently, regardless of the position of the auxiliary poppet valve. It is about 3-8 inch in diameter and admits a lot of air. It is clear to me that the mixture is too weak at slow speed, for when I lay a card over the air intake and gradually slide it over the opening, at a point when it is very nearly closed, the engine begins to fire regularly and perfectly. Can you help me in this case? I assure you that your assistance will be greatly appreciated.

New Haven, Conn.

DICK WILES.

As you state toward the end of your letter, you have located the trouble beyond a doubt by partially closing the main air intake of the carbureter, upon which the engine will run satisfactorily at low speeds. The only thing that remains to be done is to provide a means of supplying a mixture of the character indicated by your experiments. We should not recommend raising the float level considerably to do this, as trouble will doubtless result when running at full speed. Before making any radical changes we should recommend laying your experience before the makers of the carbureter, as this is a rather unusual action for any modern type of compensating carbureter, in view of your statement that no amount of adjustment suffices to correct it. In case no relief is forthcoming, we should suggest fitting a slide or other means of closing the main air intake and inter-connecting this with the throttle, so that when the latter is closed the air supply will also be cut down proportionately and the engine run slowly without missing, as it does when this opening is almost closed with a visiting card, as you relate.

Formulæ for Figuring Rating of Different Types.

Editor THE AUTOMOBILE:

[645.]—As I am a subscriber, I would appreciate it very much if you would give me a reliable formula for figuring horsepower. I notice in Brooke handbook the following is given:

$$\text{H.P. equals } \frac{D^2 \text{ times } S \text{ times } N}{18,000} \text{ for four-cycle motors}$$

and

$$\text{H.P. equals } \frac{D^2 \text{ times } S \text{ times } N}{21,000} \text{ for two-cycle motors}$$

in which D is the diameter of the cylinder bore, S the stroke, and N the number of revolutions. I don't think this can be right, as a two-cycle motor would then have less power than a four-cycle of the same size. Please give me your opinion on this.

Oregon, Ill.

F. R. ZIEGLER.

The formulæ you cite from Brooks are based upon an assumed mean effective pressure, dependent upon the grade and character of fuel used. They are also given by Roberts in his Gas Engine Hand Book, but the denominators there used are 18,000 for the four-cycle and 13,500 for the two-cycle type of engine. In other respects these authorities agree. Roberts gives the following method for determining this denominator, the performance of an engine of the same kind and working on the same quality of fuel being already known. Let X be the unknown denominator; then,

$$X = \frac{D^3 \times L \times R}{B. H. P.}$$

He further states that the above formulæ have been well borne out in practice for the best performance of the average gas engine. We think the old steam engine formula, given in last week's issue of THE AUTOMOBILE in response to letter No. 620, is more satisfactory for both four and two-cycle engines. As to your last question, it is generally conceded that the average two-cycle engine does not actually develop as much as a four-cycle engine of the same dimensions, due

to the imperfect scavenging of the cylinder, the difference being about that indicated by Brooks in his formula. We are aware that this goes counter to the theory of the matter, some makers even claiming that the two-cycle engine will develop twice as much power as a four-cycle of the same dimensions, but this is not borne out.

Information Regarding Front-Driven Cars.

Editor THE AUTOMOBILE:

[646.]—Kindly answer these questions in "The Automobile": (1) Where can I gain any information concerning front-drive cars—Christie's especially? (2) Is it front or back steering? (3) How is the gear-changing performed? (4) What is meant by a two-throw crankshaft? (5) Were there any pictures and description of Christie cars in any former issues of "The Automobile," and will there be any later on?
FRONT DRIVE ADMIRER.

Bayside, N. Y.

(1) In speaking of front-driven cars, we presume you confine yourself to those of the gasoline type. While a number of cars of this kind have been built by investigators, so far as our knowledge goes the Christie is the only one that has been developed to the extent of building more than a single car.

(2) It is front steering and as originally designed (the racing car) was both front and rear-driven.

(3) We believe the change-speed gear is of the sliding type, giving a single speed forward and reverse, and is located inside the crankcase and driven by a large gear fixed to the crankshaft between the pairs of cylinders and engaging a small pinion on a parallel shaft, which is in turn geared to pinions directly attached to the front wheels. This gives the slow speed for starting, the direct drive being by means of clutches at each end of the engine, so that on the high the motor is directly turning the road wheels.

(4) Throw is commonly accepted as a synonym for crank, so that a two-throw crankshaft would be one having two cranks regardless of their placing, and the crankshaft of the standard type of motor would accordingly be termed a four-throw, though its two pairs of cranks only lie in two different planes. In some instances the word appears to be used with reference only to cranks placed at different points on the circumference, so that, taking this meaning as the correct one, the usual four-cylinder crankshaft would be denominated a two-throw crankshaft. We believe current usage, as long established in steam engineering practise, favors the first meaning referred to.

(5) The Christie car has doubtless been described in THE AUTOMOBILE, but it is so long ago that the issue is out of print. The Christie racing car for the Grand Prix will be described in the near future.

Information Wanted Regarding Primary Cells.

Editor THE AUTOMOBILE:

[647.]—I would be pleased to have you tell me through your "Letters Interesting and Instructive": (1) How dry cells are made; that is, what materials are used, and in what proportion, and how. Are there many ways to make these cells? (2) What materials are used in a wet battery? Please give several ways of making these if there is more than one way.

High River, Alta., Canada.

E. H. SCHROEDER.

(1) The composition of the dry cell was explained to some extent under the head of "Sources of Ignition Current," which appeared in the issue of THE AUTOMOBILE of February 21. The positive element is made of sheet zinc forming the containing case; in this is placed a rectangular piece of carbon slightly less in width than the diameter of the container. It rests upon a piece of wood or other insulator, so as not to short-circuit the cell by coming in contact with the zinc. Between the carbon and zinc is packed manganese dioxide, or some other depolarizing material, and a special paste, sawdust or other absorbent. The cell is filled level with the top of the case and a solution of 25 to 30 per cent. sal-ammoniac and water is then poured on the contents until the cell has taken up all the liquid it will hold.

It is then sealed with pitch or similar material, one or two small holes being left for vents. This is substantially the way used in making these cells by the majority of makers, so far as we know, but all the large manufacturers of dry cells have special formulæ and methods of their own, which are trade secrets. We should not advise any amateur to attempt to make dry cells, as they can be had at a fraction of what it would cost, the result of the home process also being doubtful.

(2) It would require a large-sized volume to satisfactorily answer your second question. There are hundreds of types of what you call wet batteries, technically known as primary cells, and it will depend entirely upon what service you wish to use them for. If for ignition, the Fuller bichromate battery will work well on a slow-speed stationary engine, but is not suitable for automobile or boat work, owing to its bulk and weight, as well as its tendency to polarize quickly on closed circuit. Jars measuring about 6 by 8 inches are used, the elements consisting of a large flat plate of carbon and a small cone of zinc, weighing about a pound and a half, and with a connecting wire cast in it. The zinc is placed in a porous earthenware jar about 2 1/2 inches in diameter which is set in the center of the glass jar. A dilute solution of sulphuric acid and water is poured over the zinc and the remainder of the cell outside the porous jar is filled with a solution of bichromate of potash, sulphuric acid and water. This is made by dissolving about half to three-quarters of a pound of bichromate of potash in two quarts of hot water. After it has cooled, one part of sulphuric acid to every ten parts of water is added and the solution again permitted to cool. It is then ready for use. The e.m.f. of this type of cell is about two volts, or slightly over when fresh; it is largely used for telephone service. But, as already stated, it is but one of hundreds of different types. Zinc, carbon and a sal-ammoniac solution in a glass jar is probably the simplest form of open circuit cell, but any of these batteries can be bought much cheaper and much better than they can be made at home.

Formulæ for Calculating Torque.

Editor THE AUTOMOBILE:

[648.]—Will you kindly give me, through your journal, under the heading "Letters Interesting and Instructive," a formula for determining the torque given to a shaft on shaft-driven cars; also the torsional strength of .30 carbon O.H. steel and nickel steel shafts for different lengths?

INQUIRER.

Plainfield, N. J.

Let a horizontal shaft of diameter D be fixed at one end, at the other or free end, at a distance L from the fixed end, let there be fixed a horizontal lever arm with a weight P acting at a distance A from the axis of the shaft, so as to twist it; then Pa = the moment of applied force.

Resisting moment = twisting moment = $\frac{S J}{c}$ in which S = unit shearing resistance, J = the polar moment of inertia of the section with respect to the axis, and c = the distance of the most remote fiber from the axis, in a cross section. For a circle with a diameter d ,

$$J = \frac{\pi d^4}{32}; \quad c = \frac{1}{2}d$$

$$Pa = \frac{S J}{c} = \frac{\pi d^3 S}{16} = \frac{d^3 S}{5.1} = .1963 d^3 S; \quad d = \sqrt[3]{\frac{5.1 Pa}{S}}$$

The torque or twisting resistance of a shaft may then be calculated as follows:

$$T = \frac{\pi}{16} d^3 S = .1963 d^3 S, \quad \text{whence } d = \sqrt[3]{\frac{5.1 T}{S}}$$

In which T = torsional moment in inch-pounds, D = the diameter in inches, and S = the shearing resistance of the material in pounds per square inch. If a constant force P were applied

to the end of the horizontal lever (in the case of a crankshaft, the crankpin) tangentially to its path, the work done per minute would be:

$$P \times L \times \frac{2\pi}{12} \times R = 33,000 \times \text{I.H.P.}$$

In which L=length of the crank in inches, and R=revs. per min., and the mean twisting moment $T = \frac{\text{I. H. P.}}{R} \times 63,025$. Therefore,

$$d = \sqrt[3]{\frac{5.1 T}{S}} = \sqrt[3]{\frac{312,427 \text{ I.H.P.}}{R. S.}}$$

The forgoing formulæ are given by Kent. We cannot answer your last question on the data you give, as the phosphorus content of the steel has a most important bearing upon its strength. You would be more apt to get definite information by inquiring of steel makers of the class of material usually supplied for this purpose, with its specific characteristics.

Two Thousand R. P. M. for Two-Cycle Engine.

Editor THE AUTOMOBILE:

[649.]—I am about to build a four-cylinder two-cycle engine, and would like to have your opinion on these dimensions: Bore, 5 5/8 inch; stroke, 5 1/2 inch; inlet port, 1-2 inch; exhaust port, 3/4 inch, both ports running half way around the cylinder; compression space, 1 5/8 inches, to be fitted with rotary valves in the crank-chamber; connecting rods, 12 1/2 inches. Do you think that this engine will turn up 2,000 r. p. m.? SUBSCRIBER.

Buffalo, N. Y.

From the query at the foot of your letter regarding the speed to which this engine will turn up to, we are led to infer that it is your object in designing it to produce a high-speed motor. In such a case, the inlet and exhaust ports are much too narrow. It is doubtful if a motor of the cylinder dimensions you mention, could be made to turn 1,000 r. p. m. with ports of the size given, and its normal speed would be nearer 500. Of course, it might be raced to up to 2,000 r. p. m. without load, but it could not develop any power at that speed. Making the inlet port 3/4 inch and the exhaust 1 inch would give more suitable proportions and probably it would be found advantageous to increase these dimensions still further, making them 7/8 and 1 1/8 inches respectively, and an increase in the compression, or, in other words, a decrease in the clearance, which we presume you mean by "compression space," would also be desirable. There is no reason why a properly designed two-cycle engine cannot be made to turn up to 2,000 r. p. m.

How to Procure a License as Chauffeur.

Editor THE AUTOMOBILE:

[650.]—Will you please tell me how I can get a license to run a car? I am a driver in New York State, and have worked in a repair shop for one year. F. E. FLYNN.

Fulton, N. Y.

Write to the Secretary of State, Albany, N. Y., for application blanks. Fill out and return with the customary fee and the license will be granted. The formalities required are merely a statement of the applicant's name, address and the names and types of vehicles he is experienced in operating.

Information Wanted on Exhaust Horns.

Editor THE AUTOMOBILE:

[651.]—I wish to make an exhaust-blown horn, but am unable to find any literature that would enlighten me on the size of the reed. It is to be 5-8 inch wide, and between 2 and 3 inches long. Of what gauge spring brass should I make it, and how long, in order to get a deep bass note? E. F. McNUTT.

Youngstown, Ohio.

This is apparently a case where nothing but the "cut and try" process will aid you, unless you can get some maker of this kind of horns to unbosom himself on the subject and give you the result of his experience. Failing the latter, you will have to go ahead and design an experimental horn and see how it works,

correcting the faults that may appear until you are satisfied with the result. We presume the thickness of the spring brass required will depend very largely upon the amount of pressure to be used, not to mention other equally important factors.

Proper Amount of Lift for Valves.

Editor THE AUTOMOBILE:

[652.]—On a 4x4 double opposed auto engine, mechanical exhaust, automatic inlets, how far should the exhaust open, measuring 1 inch or 1 1/4 inches at opening? J. G. BENEDICT.

Coin, Iowa.

With the mushroom type of valve, which is in practically universal use on automobile motors, it is customary to figure on giving the valve an amount of life equivalent to one-fourth of its diameter. This gives the theoretical full opening of the passage closed by the valve; no advantage is to be gained by giving it more lift than this, and less will tend to choke the engine, according to the extent to which the passage is reduced. Hence the proper lift for the exhaust valve of the engine you mention should be one-fourth inch.

A CORRECTION FROM MR. MATLACK.

Editor THE AUTOMOBILE:

[653.]—In your issue of February 21, under the head of "Letters Interesting and Instructive," you printed my letter No. 591, referring to compression and compression space, method of computing. Will you look over my original letter and compare my method with that which appeared in the above issue? I think you will find that I denote the total volume by V (large), and compressed volume by v (small). You also have X equals (Vt plus 460 times 0.002 times 14.7 minus 14.7 equals increase in pressure. But it should be X equals (Vt times 0.002 times 14.7 minus 14.7 as Vt equals 840 plus 460 equals 1300.). And on the twenty-seventh line you have the word "compressure"; it should be "compression." Also, you have

Compression Pressure equals $\frac{v \text{ times } 14.7}{V}$ It is $\frac{V \text{ times } 14.7}{v}$

These corrections agree with my copy.

R. C. MATLACK.

Chicago, Ill.

THE OLD STORY OF PRACTICE VS. THEORY.

Editor THE AUTOMOBILE:

[654.]—No. 607, who signs himself Louis Ruthenberg, causes me to wonder where he got his information as to the practical side of the friction drive. I own a Model 5 Lambert automobile, and from what follows I have demonstrated to my own satisfaction that the Lambert friction drive is all right. This car has carried five grown people and two children up a 25 per cent. grade and six grown people and nine children up a 10 per cent. grade. This same car has plowed through Illinois mud four to six inches deep for eighty miles, averaging nine miles an hour. It has also plowed through Illinois and Iowa sand with the same up to the chains on the sprocket wheels. My first or "greenhorn" paper wheel lasted 1,700 miles in a hilly country. These tests were made with the regular 16-horsepower engine. F. W. STEWART.

Princeton, Ill.

JUST A BIT OF FACETIOUSNESS.

Editor THE AUTOMOBILE:

[655.]—Apropos of some of the inquiries made in your correspondence department, will you please answer the following?

(1) If the inlet pipes from the carburetor were lined with roller or ball bearings, would it facilitate the flow of gas either to the piston chamber or from certain correspondents?

(2) If, at 967 revolutions per minute, a man were seated on the connecting rod wristpin, how soon would he get a headache, and would its relative degree of thermal intensity, calculated in foot-pounds, be greater or less than the one under which the editor must be suffering?

(3) Does the expense of owning an automobile consist chiefly in repairs, guests, or fines? E. P. UNUM.

New York City.

PLEASE GIVE US SOMETHING EASIER.

Editor THE AUTOMOBILE:

[656.]—The picture on page 436 in your issue of March 7 is certainly a "dandy." Will you please explain how a car could run through three or four inches of soft snow, as shown, and not leave a track? And oblige, A SOUTHERNER.

New Orleans, La.

Prospecting for Gold in an Automobile

by A. S. Atkinson.



TONOPAH, THE GOLD MINERS' EL DORADO OF THE NEVADA DESERT, AS IT LOOKS TO-DAY.

PROSPECTING for gold in an automobile is a common experience in Nevada, and the experience is interesting and instructive. The groups of Tonopah and Goldfield mines were originally about 200 miles from a railroad, but the trip on the back of a burro seemed like a thousand. Scores perished in the alkali dust of the desert, but a few persisted. They found gold, and, in spite of the hardships, thousands rushed to the new mining regions. Many of these would have perished had not the automobile come to their rescue. The automobile is the only vehicle which can travel across these alkali deserts without any apparent suffering. Horses and mules drop by the wayside and die like fleas, but the motor-driven vehicle skips along, immune both to dust and sun heat.

When we took our ride across the desert to the now famous mining camps regular auto passenger and freight service was in operation. We could make the trip in a luxurious car for \$20—baggage extra. Everybody made the trip in autos. Even the miner with only a few weeks' funds ahead puts up the amount and travels in state. A good many have made small fortunes in operating autos on this desert trail. One man brought five touring cars here a year ago, and he has been renting them out almost daily at \$100 per day. A chauffeur gets \$10 a day and such perquisites as he can pick up.

Bag of Gold for Breaking the Record.

"Here's mine," explained a young, heavily-goggled driver to me, displaying a sack of gold. "Just took a fellow who struck it rich over to Tonopah and back. Said he'd make it worth my while to hurry. I took him at his word, and we beat the record. When he left me he dropped this in the car."

Judging from its weight, the gold might assay enough to buy a new car. Another young man from the East who came West in his car told me that he had picked up \$10,000 in the past twelve months in carrying passengers and renting out his car. It is not uncommon to pick up crazy-minded gold fiends who will pay almost any price for a machine that will get them there.

When we struck Goldfield there was a subdued excitement in the air. There had been a new strike in the hills by a miner who a few days before had to mortgage his outfit to get food. When we arrived he was worth almost any sum within six figures. He was beset by gamblers, speculators, and miners who wanted to buy him out. Our first glimpse of him was when he rushed out of

one of the saloons, wild-eyed and apparently cornered. Seeing our machine, he rushed toward it and said:

"Say, strangers, how much fur that thing?"

We informed him that we did not care to sell our car, but, not accepting this as final, he continued:

"I want it bad. I want to get out of here fur a breath of fresh air. God, I'm coated an inch thick with alkali dust, and I'll never get rid of it if I don't move out now. I've struck it rich, but I'm goin' to sell out. I won't work the claim."

Then, watching us closely, he said: "I'll give you \$5,000 for that car."

We still demurred, and the man instantly raised his bid:

"Make it \$7,000, and if you won't take that, I'll give you the limit—\$10,000."

Here was a deal made by a gold-crazy, homesick man, but we compromised by offering to take him out of the desert for a nominal sum. We didn't care to sell our car at any price.

Alkali Dust Penetrates Everything.

If you never toured in the Nevada alkali desert you never can appreciate the conditions there. The alkali dust is everywhere. Goggles don't seem to keep it out of the eyes, and within a short time they smart as though pepper had been thrown in them. Then your throat gets dry, thirsty and hard. Breathing is rendered so difficult that an asthmatic is happy in comparison. You drink and drink, but the hard water of the desert simply makes matters worse. It is a veritable inferno for the first few days. Then nature apparently comes to the rescue. Your eyes get more used to the dust and begin to recover. Your throat gets coated with a good layer of dust, and it is then impervious to further trouble. During the season of hardening, however, the average man suffers torment.

Autoists are constantly arriving at the gold fields. Some are there out of curiosity, others are prospectors, newspaper correspondents, gentlemen, adventurers, engineers, mining students, and the driftwood from all parts of the country. The appearance of an automobile costing several thousand dollars is no indication of wealth, nor does a new one excite any comment. There are too many plying back and forth across the desert.

Gasoline at the Point of a Muzzle.

We stopped one day in the middle of the desert and made

preparations to eat our lunch. Suddenly to the right of the trail appeared a black speck, which grew in size until it assumed the appearance of a car flying heavily and asthmatically toward us. The two occupants of the car were trying to attract our attention. When they finally reached our side, the driver jumped down and said:

"Got any spare gasoline 'bout you?"

To our negative reply, he smiled sourly.

"Say, mister, we've got to have a few extra gallons. We've struck a 'lead,' an' we can't abandon it now. We've run short of fuel, and we haven't the time to go back to get more. If you'll let us have a few gallons, say just what you don't need to get you home, we'll pay well for it."

"We haven't much in the reserve tank," I began. Then I stopped and changed my mind. I was looking into the ugly muzzle of a weapon thrust at a dangerous angle toward me. The owner of it said quietly:

"You say, mister, it's worth about \$5 a gallon? All right, me an' my pard will take it. Just fill our tank, and we'll call it an even \$25."

Discretion was the better part of valor. There was no other human being in sight on the lonely trail, and that ugly-looking revolver did not waver. We meekly transferred all the reserve fuel we had on hand. The man chucked a roll of greasy bills in our car and rode off with the remark:

"Sorry, mister, to treat you so. If we strike it we'll set up for you, if we ever meet again."

Think of being held up in the desert in true stage-coach fashion for a few gallons of gasoline!

Did we meet our highwaymen again? Yes, a month later, in a gambling place in Goldfield, someone struck me on the back, and a familiar voice said:

"Glad to meet you again, mister. You did us a pretty good turn that day in the desert. We made the strike, and your gasoline did it. Now just ask for what you want. The establishment hasn't anything aboard that's too good for you. And if they haven't it here we'll send to Denver for it. Speak up."

Our requests were so modest that our erstwhile desert highwaymen appeared disappointed.

Desert Trail Leads Nowhere and Anywhere.

The trail over the desert leads to nowhere and anywhere. It is a winding trail marked out on a desert of alkali dust. In the Winter it is cold and barren, and in Summer so hot that the brain reels. The sun scorches everything, and the hot dust, filled with alkali and arsenic, fairly stifles one. After sundown there is some relief. The stars come out and blink like diamonds. The atmosphere is so clear that the heavens seem miles nearer. Not a cloud or speck of fleece for nights and weeks obscure the heavens. Autoing by starlight is, therefore, the ideal way to travel. After the long, hot day, the night is a relief. A tent of double thickness provided for protection from the hot sun is a godsend. Without it people crossing the desert wilt and shrivel up like leaves. It is a sight to see one of the regular automobile expresses heave in sight and discharge its passengers. There will be some old hardened miners and prospectors who do not appear to mind the terrible ride, but a few newcomers are among the lot. These look worse than seasick passengers on an ocean steamer. They are veritably encased in alkali dust so that it is difficult to move. They have lost all interest in life, and, if conscious, are generally silently cussing themselves for ever leaving civilization.

Before the Automobile Came on the Scene.

Before the automobile came to this region the mining prospector and investor had a hard time of it. The railroads are slow to build new extensions to their main lines to gratify the demands of a small mining camp. There have been too many of such "boom" towns, and the railroads want some assurance that a new settlement is going to be a permanent place of abode. Until this can be demonstrated the miners have to put up with such

methods of travel as they can find. The horse is not adapted to the desert, and the mule can be made to live and do fair work under certain conditions. Freight is transported by heavy wagons drawn by a dozen or more burros, but passengers, infected by the gold fever, can never endure such slow traffic. The auto is the vehicle for them, and so there is a thriving business in these vehicles.

Unlike most mining camps, the new gold fields of Nevada are located at the foot of hills approached by perfectly level stretches of hard sand, across which the automobiles can fairly fly. Here are the greatest speeding stretches in the world. Hard, smooth, and level as a billiard table, and with almost endless vistas, the desert is a perfect place for speeding. It is a treeless and waterless region, but then there are no laws to regulate fast traffic. One can go as fast as his machine will permit, and no one will interfere. It is a scorcher's paradise, but, unfortunately, there is too much monotony in the landscape. Mile after mile is covered, and there is nothing to break the vista of sands. Occasionally one passes a prospector accompanied by two pack burros, or a caravan of heavily loaded wagons drawn by a dozen mules, or possibly some dejected miner who has given up hope and has dropped down by the trail to sleep and die.

The Fierce Ride Across the Burning Sands.

For anyone whose blood runs red, and who knows the exhilaration of fast speeding, the stretches of sand in Nevada must hold a certain amount of fascination. The tragedies of the gold mines, and the fearful heat of the sun and the tormenting pangs of alkali in eyes and throat, are forgotten in the fierce ride across the burning sands. The motor laughs at both heat and dust, and the rhythmic click and chug of the engine form a hymn of praise to man's genius in conquering nature in its worst forms.

There are all classes met in the gold fields, and particularly is this true of Nevada, where the name of Goldfield and Tonopah have served as magic drawing cards. One is surprised at the number of young men fresh from our mining colleges and other universities. They have come to the new regions to get their first hard experience in practical mining. But it is difficult to follow prosaic engineering in such an atmosphere. About half of them change their attitude when they have been here long. One college football player is now driving a passenger automobile, making more money than half those who delve in the sands for gold. Besides his \$10 a day he picks up enough tips and extras to pay for his ordinary expenses. Another operates a stage line consisting of four automobiles between Tonopah and a neighboring mining camp. He is winning a fortune which later he may lose in the gamble for rich strikes. A third has been lucky in renting his machine to rich capitalists who appear on the scene almost daily and demand some means of pleasant transportation. One young man borrowed enough to purchase an automobile, and hied to the gold fields. Within two months he paid back the borrowed money, and to-day he owns in addition to his car two "claims," which may and may not prove valuable.

The autoist, passing through a new country, is always struck by the peculiar differences existing between the people there and from where he came. In the mining camps he can study human nature in the cosmopolitan form. They are all there, and the motor completes the final setting. If it were not for the alkali dust, the intense heat of the sun, and the parched, scorching torment of eyes and throat, it would not be difficult some day to imagine New York not a day's ride away, with all its wealth and fashion and its glitter of things that are not gold.

The annual meeting of the Austrian Automobile Club brought a re-election of Prince Alexander Solens to the presidency, with Major Wolf and Count Szecheny as vice-presidents. The new committee consists of Count Pallacini and Schoenborn and Messieurs Bacher, Buschbeck, Hardy, Dr. von Mayr, Ruziczka, Eger, and Professor Goebel. The club has now a membership list of 891, and is financially in a flourishing condition.

TONOPAH-GOLDFIELD WINTER RUN.

Several months ago Jed Newkirk, an automobile driver of some prominence, came to New York City and selected a car for use in the Nevada gold fields. There comes from him the story of a recent winter trip of two S. & M. Simplex cars embracing several hundred miles of desert and swamp lands, borax beds, and the roadless country between Tonopah, Goldfield, and through Death Valley. The 30-mile run between Tonopah and Goldfield over a road which had had a three-day fall of snow, was covered in less than two hours.

After thawing out at Goldfield for an hour, the party started for Beatty, 71 miles distant. Just before passing through Baton they were obliged to ford a creek and to pass through some remarkably frozen country. At 8 o'clock that evening both cars arrived at Beatty, where the night was spent.

The next morning they started across Ash Meadow, which is 16 miles of swamp. It was not frozen, and, to make things worse, the rain poured in torrents, causing the wheels of the machine to sink in the ooze up to the hubs. After reaching Longstreets' Ranch, where the party partially "dried out," a start was made next morning for Greenwater. On the way it



JED NEWKIRK DRIVING S. & M. SIMPLEX ACROSS THE BEDS OF SALT AND BORAX.

was necessary to ford the Amagoshia river, which has an exceptionally strong current and is about 150 feet wide and three feet deep. In fording the water nearly drowned the motor, short-circuiting the magneto. The distance of 24 miles to Greenwater was covered in three hours.

That afternoon they were joined by a prospector who wanted to show them a claim he had marked out in Death Valley, in the Funeral Range Mountains. While this was only 14 miles distant, it was necessary to travel 90 miles over and around the mountains. There are absolutely no roads in this part of the world, owing to the numerous cloudbursts which make them impracticable. Upon arriving at Death Valley and passing "Scotty's" mine, the Amagoshia river had to be forded once more, and the destination was reached in a little over ten hours.

The party returned to Tonopah by a different route, necessitating the crossing of about six miles of borax beds and a rocky combination of salt and borax brutally rough and as hard as steel. Speaking of this stretch, Mr. Newkirk said: "It has never been crossed by a vehicle before, nothing but burros ever having attempted it. It is 200 feet below sea level and so intensely hot with vapor arising that the eye cannot see a mile in any direction."

The rest of the journey was made through the Furnace Creek Ranch of Smith, of "twenty-mule team borax" fame, over mountains 5,600 feet above sea level, through surfaceless roads that native miners claimed were unnegotiable, and ramming through snow-banks five to six feet deep. The party finally returned to Goldfield and from thence made their way back to Tonopah. Through the snow-drifts it was necessary to use one

car as a snow plow with the second car following in its tracks, pushing the first; then both cars retreating and making a new attack to gain little more headway. This was done for ten hours at a stretch during part of the journey.

MADAME "BOB WALTER" IS DEAD.

France has not had the honor of producing many female automobilists. Indeed, women who drive autos are so much of a rarity that when one is seen it is safe to predict in nine cases out of ten that she is of American origin. Among the few members of the fair sex who have figured in the French automobile world is Mlle. Baptistine Dupré, better known as "Bob Walter," who has just died in Paris after a short illness. Madame Bob Walter is known to most Americans who have visited Paris by reason of her extensive garage in the Avenue de la Grande Armée, and the large business she did in renting touring machines. The firm had a reputation for the part it had played in the sensational runaway matches. A machine was ordered to be at a given address at a stated hour, it took on board a young couple, a few hours later a wedding ceremony was celebrated in Switzerland, Luxembourg, or Belgium, and the next morning the newspapers announced the elopement. Mme. Bob Walter displayed so much discretion in these affairs and was always so successful in her enterprises that she became an essential collaborator in all elopement cases.

The gay Toulousian first appeared before the Paris public as a theatrical artist, but left this profession a few years ago to enter the automobile business. In addition to her garage, renting business, the Napier, Vinot-Deguignand and an American motor boat agency, she played a prominent part in sporting events. At the Gaillon hill climb in 1902 she covered the kilometer in 1:30, one of her competitors being the famous Théry. The following year an automobile demonstration was given in the Bois de Boulogne in honor of the Shah of Persia. Madame Bob Walter was one of those who drove past the royal stand in a racing machine. Instead of rushing by at top speed, as the others had done, she stopped her machine opposite the Royal visitor, much to the annoyance of Baras, who was close in her rear, and who was more concerned over a kilometer record than paying homage to the King of Kings. The lady chauffeur combined with her business and sporting abilities a keen sense of humor and a happy repartee which stood her in good stead on her frequent appearances before the magistrates for exceeding the speed limit.

RACING MEN MUST HAVE SPECIAL LICENSE.

PARIS, March 12.—With the opening of the European racing and competition season, the new regulations of the Automobile Club of France, requiring every driver to have a license, come into operation. Owing to numerous complaints against drivers in touring, endurance and racing events, it was decided last year that no man should be allowed to compete in any event run by the A. C. F., or approved by that body, unless he possessed the competition license. As the club will only recognize those contests in which this condition is imposed, it practically follows that to compete in any race or contest on the Continent of Europe the driver must be licensed by the A. C. F. Obtaining the license is a very simple matter. The applicant should write to the Commission des Concours, at the A. C. F., Paris, stating his demand and enclosing a small photograph of himself mounted on cardboard. The license is pasted on the back of the photograph, and is granted to every applicant giving proof of his ability to handle an automobile. The A. C. F. reserves the right, however, to withdraw the license in the case of accidents caused by the driver, inobservance of racing rules or inattention to the orders of officials. This rule will, of course, apply to Americans taking part in any recognized race or competition in Europe.

TOO MANY RACES IN EUROPE THIS YEAR

THERE is interest and not a little profit to be had by a study of the automobile competitions to be held in Europe this year, for it is quite possible that similar conditions will be met with in this country in the near future. France in particular has made a specialty of organized competitions ever since the days when automobiles ran their faltering course on her broad highways. The policy was a wise one, for it not only encouraged manufacturers to renewed effort and developed better types of machines, but created an interest in the new industry among all classes of citizens. This year there will not be more competitions than usual, but there will be greater variety than ever before. Unfortunately it is not the variety which is the spice of life, but one already the cause of discord and some ill-feeling.

Excepting the Herkomer tour, all the European automobile competitions are speed tests. It is true that they are not all races in the sense of the Vanderbilt Cup or Grand Prix contests, but whether the contestants be 120-horsepower monsters, or small doctors' cars, fulfilling a very varied program, speed is the final standard by which they are all measured. All other schemes for measuring the value of a number of competing units have proved utterly unable to clearly indicate the winner or to present to the public a clear, unmistakable result. There have been innumerable competitions intended to test the all-round qualities of cars, and having for this purpose an elaborate point system. In nearly every case they produce half a dozen "winners" and, as in the case of *Le Matin* tour round France last summer, a prize for everybody.

The present difficulty is how to circumscribe the power of the machines so that the competitors shall start on an equal basis and the most rational type of machine be developed. The A. C. F. first broke away from the old weight limit which for a number of years had been the sole controlling factor in big speed contests in various lands, and substituted a limited fuel supply, as previously experimented by the English in the Tourist Trophy race.

Pleased with their move, the French Club announced a second race on the same basis, but with provision for cars of a moderate power. The limited fuel allowance Grand Prix obtained thirty-four entries—sufficient to give it the mark of success. The second race similar, but with a more limited fuel supply, obtained nine entries—sufficient to brand it a failure. Germany produced the Emperor's Cup race, with a limited cylinder bore, minimum weight and a few specified body dimensions; manu-

facturers showed their approval of the regulations by entering 92 cars, the biggest number obtained in a European race. Italy adopted a limited cylinder bore for its two big races, the Targa Florio and the Brescia circuit. Belgium has the old weight limit for its big race and a limited cylinder area for its Liedekerke Cup, with a provision that at least ten machines identical with the racers shall have been delivered to the public. The Marquis de Dion's foundling, known as the Press Cup, has a limited fuel supply as means of limiting the engine power, a minimum weight, a fifteen hundred miles eliminating tour and a three-hundred miles race as final test.

Discussion is raging fiercely on the various regulations, each one of which has its detractors and its enthusiastic supporters. The Grand Prix generally meets with approval, most manufacturers being of opinion that a fuel allowance of 6.6 gallons per 62.1 miles is preferable to the old 1,000 kilos weight limit. Its only opponents are those who are adverse to racing under any conditions. The second Grand Prix, or Sporting Commission Cup, a speed test on 3.3 gallons of gasoline per 62.1 miles, meets with criticism from every quarter. The opinion is widespread that a weight limit of 2,200 pounds should have been imposed to save the race from featherweight racers. With 6.6 gallons of gasoline an engine of 120 to 130 horsepower will be constructed which must weigh at least 2,200 pounds to stand the strain of a long, fast run. A minimum weight limit is therefore not necessary. With only 3.3 gallons a honeycomb racer weighing not more than 880 pounds, and driven by a high-compression motor of at least 60 horsepower, will be presented. Darracq alone is capable of producing such a light flyer, say the European constructors, and they leave the race severely alone. The German race generally meets with approval, as is shown by its big entry list. Certain critics, however, object that it will by its limited cylinder bore cause the development of engines running at an abnormally high rate. The Liedekerke Cup, the British Tourist Trophy, and the Press Cup of the A. C. F. are all approved in principle, but meet with criticism in their details. It is difficult to find two experts agreed as to the correct body weight and load for a given horsepower. A minimum weight keeps out light freaks, but it does not at all incite the body builder to produce comfortable, light coachwork. As everybody knows, it is weight that kills, and it is time the body builder cut down the enemy as the metal worker has done.

FROM PEKIN TO PARIS BY AUTOMOBILE

PARIS, March 11.—Nineteen cars have been entered for the adventurous auto tour from Pekin to Paris this summer. A few weeks ago *Le Matin*, a Parisian daily journal, made a violent attack on road racing in France and declared with such assurance that the Grand Prix would be annulled that the Automobile Club of France took fright and sought an interview with the Premier. Events proved that the semi-official *Matin* was wrong and a hearty laugh was directed against the journal. Undaunted, the paper attacked the touring contests, declaring that they were all worthless as a test of endurance. The Marquis de Dion took up the defense of the autoists and declared that a modern machine was capable of going anywhere. "Try a run from Paris to Pekin then," said the *Matin*. "Done," said the Marquis, and three De Dion cars were entered forthwith. Since then it has been decided to run the contest westward instead of eastward, and to open the competition to any car without restriction of horsepower, weight or nationality. On June 15 the competitors will be shipped by sea to Pekin, disembarking at Tien-Tsin. The caravan will pass over the Gobi desert, avoiding Moukden and Kharbine, with its anti-auto and anti-Euro-

pean natives. No one knows if there are any roads, but as Cormier, the European Gliddenite, says, the best thing to do is to go and find out. Gasoline stations will be in charge of the Asiatic Petrol Company, of Sumatra, on the Chinese portion of the route, and of Messrs. Nobel on the Russian section. The cars at present entered for the 8,750 miles' run are as follows: Itala, Prince Borghese; De Dion Bouton, three cars of 6, 10 and 15 horsepower; Contal, 8-horsepower voiturette and 6-horsepower tricar; Metallurgique, two machines of 30-horsepower, and one of 40-horsepower; Panhard, 18-horsepower, Baron Duquesne; Porthos (French); Werner tricar; Nistrat (French); Jean Bart (French); Valkyrie (French); Auto Office (French); Sider (French); Passe-Partout (French runabout); C. V. R. (British). There are no formalities, no entrance fees and no prizes. The competitors will be sufficiently rewarded by getting back to Paris, say the organizers. And, it may be added, by the banners and flags, colored placards, big drums and shrill trumpets which the *Matin* will not forget to bring out for its own and their benefit. Americans are invited to enter and show their ability on bum roads and no roads.

SPRING ACTIVITIES IN AUTO CLUB CIRCLES

Annual Dinner of the Wachusett A. C. of Massachusetts.

BOSTON, March 18.—The annual dinner of the Wachusett Automobile Club, held last Wednesday night at the Parker House, brought together not only a substantial number of the club's members, but leading automobilists from the various clubs throughout the State and two national officers of the A. A. A. President W. H. Chase made a versatile toastmaster and the list of speakers included Elliot C. Lee, president of the Massachusetts State Automobile Association; Lewis R. Speare, president of the Bay State Automobile Association and first vice-president of the A. A. A.; F. E. Peabody, president Massachusetts Automobile Club; J. P. Coghlin, president Worcester Automobile Club; G. W. Hills, president Brockton Automobile Club; A. E. Bliss, president Malden Automobile Club; Dr. V. H. Irwin, president Automobile Club of Springfield; Frederick H. Elliott, secretary A. A. A., and A. G. Batchelder, member of the A. A. A. executive committee. Others who spoke included ex-President Putnam of the Wachusett Club, Senator Blodgett and ex-Representative Patton. The Wachusett Club is in flourishing condition, its principal membership being drawn from Fitchburg and Leominster, but the annual function is usually held in Boston at the time of the show in that city.

Philadelphia to Have Monster Orphans' Day.

PHILADELPHIA, March 18.—The advent of springlike weather has brought the local club promoters out of their winter lethargy, and plans are already afoot for a monster Orphans' Day outing, which, with the Philadelphia, Quaker City, and Germantown clubs all co-operating, promises to be one of the largest affairs of the kind ever held in the East. It is proposed to interest the local traction company officials to the extent of having them throw open the many amusements at Willow Grove Park to the little ones, free. If Willow Grove cannot be secured, some one of the other pleasure resorts near the city will be selected. It is expected that upwards of 200 cars can be secured for the run, which would insure a glorious day's outing for at least 1,000 parentless boys and girls.

The Automobile Club of Philadelphia at its meeting last week elected Alfred N. Chandler, Isaac Starr, George B. Linnard, and S. Boyer Davis to the Board of Governors.

Chicago Motor Club Will Hold Three Track Meets.

CHICAGO, ILL., March 18.—Three track meets, to be held on Memorial Day, Fourth of July, and Labor Day, respectively, will be held under the auspices of the Chicago Motor Club this season. This was decided upon at the meeting of the club last week, and Chairman J. W. Hayden of the Racing Committee has applied to the National Racing Board for the dates and official sanction. President F. C. Donald appointed a committee consisting of N. H. Van Sicklen, Secretary George G. Greenburg, F. W. Cornish, O. F. Weber and J. W. Hayden to confer with the Contest Committee of the Chicago Automobile Trade Association for the purpose of mapping out a summer's campaign of reliability runs, hill climbs, etc. N. H. Van Sicklen will represent the club on the A. A. A. Touring Board.

Automobile Club Organized at Stamford, Conn.

STAMFORD, CONN., March 19.—With a charter membership of ten the Stamford Automobile Club has been organized with the following officers: President, Dr. F. Schoir; vice-presidents, Dr. Rice, J. K. Lawrence; secretary, Dr. Dean Foster; treasurer, Dr. J. Howard Smith. Applications to the number of fifty for active membership will be acted upon at the next meeting.

President White, A. C. Buffalo, Appoints Committees.

BUFFALO, N. Y., March 18.—At the recent meeting of the board of directors of the Automobile Club of Buffalo, President Seymour P. White, Vice-President Frank B. Hower, and Secretary Dai H. Lewis were appointed as the three directors from the club to the New York State Automobile Association for the ensuing year. They will attend the meeting of this week in Auburn. President White has appointed the following standing club committees for the present year:

Membership—D. H. Lewis, chairman; J. A. Cramer, E. C. Bull, E. R. Thomas, Charles F. Benzing, N. C. Wilcox, C. B. Penney. Law and Ordinances—H. A. Meldrum, chairman; Louis B. Hart, William H. Hotchkiss, E. H. Butler, W. J. Conners, D. H. Lewis, W. H. Andrews. Grievance—F. B. Hower, chairman; J. W. Gibbs, W. H. Baker, C. A. Criqui, John M. Satterfield, Dr. G. H. McMichael, H. A. Bull. Entertainment—J. B. Eccleston, chairman; Dr. John S. McFarland, D. H. Lewis, S. P. White, W. S. Longnecker, James How, M. E. Taber. Executive—Seymour P. White, D. H. Lewis, John M. Satterfield. Roads—John M. Satterfield, chairman; E. R. Thomas, W. Allen Gardner, George K. Birge, Norman E. Mack, James D. Warren, Ralph Plumb.

Activities of the New York Motor Club.

NEW YORK, March 18.—It is among the probabilities that in the near future the New York Motor Club will have an entire house somewhere in the automobile district. An active campaign of recruiting is to be started at once and a membership close to the thousand mark is expected before the end of the summer. Monthly entertainments will be held.

There was a large attendance at the really excellent smoker given last Friday night at "Reisenweber's," the talent including prominent vaudeville performers. I. W. Fickling, the newly appointed chairman of the entertainment committee, began his tenure of office with gratifying results. Unfortunately the presence at the Boston show of many leading tradesmen interfered with the six vs. four-cylinder argument, which will take place early in April. Guests at the smoker included President Schultz of the Richmond County Automobile Club, who made a felicitous speech; Vice-President Paine, another Staten Islander, and H. A. Bonnell, secretary of the New Jersey Automobile and Motor Club. The next event will be early in April.

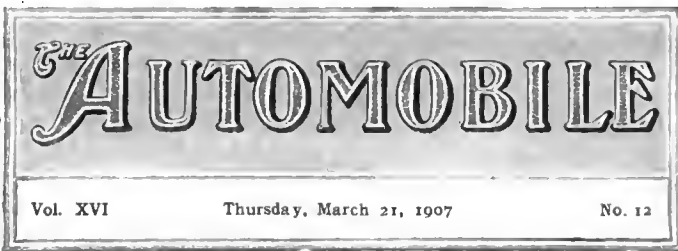
Texan Autoists Are Energetic In and About Houston.

HOUSTON, TEX., March 18.—The recent annual meeting of the Houston Automobile Club declared in favor of holding an automobile show in this city next year. In connection with the proposed show, the plan is to hold competitions and valuable prizes will be offered to attract manufacturers and others interested. A special legislative committee, consisting of Thomas J. Anderson, David Daly, Dr. Lossing, John J. Foley and C. L. Bering, was appointed to look after the interests of automobilists in the proposed auto law now before the Texas legislature.

The following officers were elected for the ensuing year: President, Harvey Wilson; vice-president, C. H. Dunbar; secretary, Samuel Bering; treasurer, G. W. Thiel; first captain, John Patrick; second captain, John J. Foley.

Quaker City Club May Have to Select Another Hill.

PHILADELPHIA, March 18.—Although the Quaker City Motor Club has not yet filed with the Park Commissioner a request for a permit to run its Memorial Day hill climb over the City Line road, the notices to that effect published in the papers



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Some Popular Ignition Fallacies Shattered. Just who was responsible for the selection of that most incongruous of terms—the word “fat,” to designate the size of an electric spark, will probably always remain a mystery. It is one of those oddities that spring up and become a part of the vernacular of a trade or profession overnight, as it were, and while its aptness from the popular point of view is undisputed, its technical signification is something that yet remains to be satisfactorily elucidated, and probably always will continue in this state. Electrical discharges through air are either in the shape of jagged lines, or are spherical, depending upon the length of the gap and other factors. The former simulates lightning on a diminutive scale, while the latter gives the impression of being more hot and fiery. Its unusual shape doubtless called forth its curious appellation, while the impression mentioned was responsible for the belief that it was the most effective for ignition purposes. If a “fat” spark could be produced at the plug, there was nothing further to be desired in the shape of greater efficiency. Such a spark was believed to be productive of greater power than any other variety.

This is a popular fallacy that has existed ever since the inception of the automobile, and in earlier days it was not confined to the user alone by any means. The coil that could bridge the longest gap or produce the largest arc was considered the best for ignition purposes, as it was thought necessary to have such a spark to fire the charge in the cylinder. To the coil makers is due much of the credit for designing apparatus that relieved the autoist of considerable of the burden of excessive battery maintenance, and recent investigations have demonstrated how

well founded is the contention that a minimum amount of current is equally effective for ignition purposes, as an amperage that proves destructive of contact points. The experiments of W. Watson, D.Sc., F.R.S., whose paper on the subject, read before the Automobile Club of Great Britain and Ireland, is reproduced elsewhere in this issue, are particularly enlightening. He showed conclusively that the length of the spark gap had no influence whatever on the power, while high efficiency was possible with a minimum consumption of current. Modern coils are designed to give satisfactory service on .25 to .75 ampere, but it is Mr. Watson's belief that with properly designed apparatus .1 ampere would be sufficient, which is somewhat of an improvement over the “fat” spark that takes two to four amperes of current.



Standardization Coming as a Natural Sequence.

While the matter of standardization is one that comes in for a spasmodic burst of enthusiastic attention from time to time, usually ending with a suggestion that the parts of all automobiles should immediately be made to conform to a certain standard, the fact that the process is one that is constantly working toward that end without the assistance of any organized effort appears to be overlooked. So far as small parts are concerned, it is extremely desirable, not alone that a certain standard be adopted and adhered to, but that it be one which makes for simplicity to the greatest possible extent. There are entirely too many small nuts and bolts about the average automobile, and, moreover, they are far too diverse in their form and size. The step already taken in this direction is one that will doubtless be productive of good results.

On the other hand, the very thing that the opponents of any general system of standardization most fear seems to be gradually coming about unaided—that close approach to conventional design of both motor and car which it is thought will discount originality and be productive of thousands of cars alike in every respect as so many bricks. There has never been a time in the past when the layman could say with more truth that all automobiles looked alike to him, as is the case at present, yet the premium on originality that is based on sound engineering and economic ideas is as high as ever. What is more, though all cars should reach a point where even the initiated find it difficult to identify them offhand, there is no fear that the time will ever come when it will be possible to pick a car blindfolded, confident of selecting the best of its kind. Given identically the same materials, the same designs and the same class of skilled workmen, the different factories will turn out cars of differing merit, so that it is a waste of time to predict the advent of a day when all cars will actually be alike, regardless of the extent to which standardization be carried, whether deliberately or unconsciously.



Automobiling Now Has Many Organizations.

If an opinion may be based upon the events of the past few months, it is safe to say that within the near future there will be no one, whether manufacturer, dealer, or owner, who cannot lay claim to identification with some body, having as its aim co-operation and the mutual benefit of those directly engaged in its particular branch of effort in the automobile industry. In a pursuit which, though destined to be one of the greatest, had to fight for its existence from the start, the first followers early became aware of the necessity for co-operation, so that automobile builders were represented by an organization almost before they could lay claim to have reached the stage of being an industry. Subsequent events have shown the wisdom of the step, and the unanimity with which the example has been followed by every group having a distinctive interest attests strongly to the benefits to be derived from co-operative effort. The spirit manifested in this universal idea of “getting together” that has been so prominent of late is commendable and should result in the lasting good of all concerned, regardless of the particular branch with which they are affiliated.

MAYOR WHO WANTS MORE SPEED IN PARKS.

PHILADELPHIA, March 18.—The recent meeting of the Fairmount Park Commission considered not a little legislation of interest to automobilists during its two hours' session. First, Mayor Weaver surprised his fellows by filing a vigorous protest against the present maximum speed limit allowed vehicles using the park roads. His honor thought it should be fifteen instead of seven miles an hour. Colonel Snowden thought the present limit is just right—and breaks the law every time he drives his spanking team of bays in the park. The Colonel, who was well aware of the Mayor's bias automobileward, avowed that there are many automobilists who are suffering from what he called the "speed craze." "They are very reckless," he said, "and go spinning along as though everybody else were dirt of the earth." "Well," responded his honor, "I would like to be able to drive through the park without fear of being arrested. Fifteen miles is a perfectly safe limit—for automobiles, at least. The seven-mile limit is violated every day, and the guards sometimes arrest those who exceed it; in the majority of cases they don't. If we only knew when they were feeling charitable we would be safe. But it's dangerous to take a chance with a guard who is liable to enforce the law to the last jot and tittle when his dinner fails to agree with him."

MORGAN AS A GOOD ROADS ADVOCATE.

JACKSONVILLE, FLA., March 18.—W. J. Morgan, well known because of his promotion of the Ormond-Daytona meets and Mount Washington climbs, is a student of good roads building, and while here the other day was interviewed by a *Times-Union* reporter. In the course of the interview he said:

"Every well wisher and believer in the undoubted great future of Florida is fully alive to the tremendous importance that can be attached to the outcome of the endeavor to have the prison labor of the State used for road building and the fate of the bills that will be produced at Tallahassee next April.

"As one who has labored in the interest of the movement North and South, I believe now, as I believed eleven years ago, when I interviewed the governors of the South on the proposition, that prison labor cannot be utilized with better results than it can in providing much needed good roads for every State in the Union."

CONVENTION OF THE AMERICAN ROADMAKERS.

PITTSBURG, PA., March 16.—Automobilists were in evidence at the fourth annual convention of the American Roadmakers' Association, held in this city during the past week. A. R. Par-dington, of the Long Island Motor Parkway, one of the most interesting speakers, was listened to with marked attention. Over a thousand highway commissioners, engineers, and road constructors from various States all over the country, attended the meetings.

One result of the convention was a promise by Highways Commissioner Hunter, of Pennsylvania, to assist by every means in his power the building of the much-sought Philadelphia-Pittsburg highway.

Chairman Robert P. Hooper, of the A. A. A. Good Roads Board, and Augustus Post, a member of the same board, were among those present.

MARYLAND HORSEMAN SUCCUMBS TO AUTO.

BALTIMORE, MD., March 17.—General Alfred E. Booth, for many years one of the most prominent horsemen in Maryland, has sold his entire stable to make way for the automobile. The last team sold was the blue ribbon pair at the Eldridge show last spring and the same two took the honors at the Atlantic City show. General Booth will build in the rear of his residence on Eutaw street one of the most spacious and elaborate garages outside of New York City.

WHAT THE NEW INDIANA LAW REQUIRES.

INDIANAPOLIS, IND., March 19.—Contrary to expectations, the automobile law passed two years ago was changed by the Indiana Legislature which adjourned last week. Those who were closely acquainted with the legislators know that the new law is nothing more nor less than a compromise with the rural constituency of some of the members pledged to make the law more stringent.

The principal change is that of the size of registration numbers, which must now be five inches high, of a half-inch stroke and white on a black background. In approaching dangerous points automobiles must be under control, and must not run at a greater speed than six miles an hour in passing farm houses or animals. Another new feature is that numbers must be carried on both front and rear.

The only other change in the old law is that in the penalties for violation, which formerly was a fine not exceeding \$50 for each offense. The new law provides a fine not exceeding \$50 for the first offense, \$100 or less for second offense and \$200 or less for the third and following offenses.

DELAWARE TO GIVE TEN-DAY PRIVILEGE.

WILMINGTON, DEL., March 18.—The new automobile law is now before Governor Lea for signature. Twelve miles an hour is allowed in cities or towns in which the houses are less than 100 feet apart. Twenty miles is the speed limit in the open country. The registration fee for owners of machines is \$3 and for chauffeurs \$2. Non-residents are allowed to use their machines ten days during the year in Delaware without registration, providing they are registered in their home State.

COLUMBUS, O., TO COLLECT MAIL BY AUTOS.

COLUMBUS, O., March 17.—Permission has been granted Postmaster H. W. Krumm by the postal authorities at Washington to make use of automobiles for collecting mails. The new service will begin July 1. Under the arrangement contemplated, the Government will furnish the machines, and if after a trial the plan proves satisfactory, a full service of autos will be installed for the collection of mail from all the boxes and sub-stations.

FIFTEEN MILES IN ILLINOIS OPEN COUNTRY.

SPRINGFIELD, ILL., March 18.—The automobile bill which has the support of the Illinois State Automobile Association has been passed in the Senate by a vote of 31 to 3. Six miles an hour is called for in business and residence districts and fifteen miles an hour in the open country. Racing on a public highway is prohibited by a \$50 fine.

KULICK TO DRIVE THE FORD CUP CAR.

Henry Ford was a New York visitor this week, and brought news to the effect that his Vanderbilt Cup racer is nearly ready for assembling. It will be driven by Kulick, well known as a Ford pilot in the past. The racer will be of six-cylinder construction and as light as possible.

STILL MORE VANDERBILT CUP ASPIRANTS.

The B. L. M. firm announces that it will construct three racers for competition in the eliminating race for the Vanderbilt Cup contest. Had particulars of the French Grand Prix been sent to this country earlier, the B. L. M. people declare that they would have entered a team of three.

LICENSED SHOW EARLY IN NOVEMBER.

Providing a rearrangement of dates can be effected by the Madison Square Garden Company—which fact is practically assured—it is among the probabilities that the A. L. A. M. show will take place during the first week in November.

THE GRAND PRIX DETAILS.

PARIS, March 12.—Although an official announcement has not been made regarding the manner in which the Grand Prix racers will be started, it is practically certain from the opinions expressed at the meeting of the Sporting Commission yesterday that the Grand Prix racers will be started first, commencing at 6 o'clock and following at one-minute intervals. The Commission Sportive racers will be started at 9 o'clock with four-minute intervals. By this arrangement the first machine to finish the race will be one competing for the Grand Prix. The wood track opposite the grand stand, particulars of which have been given, will be constructed and will be used to start the small racers. It is now practically certain that the wood banked turn proposed near Dieppe will not be built. The members of the Sporting Commission are of opinion that a special banked turn capable of being taken at high speed is not desirable. Knowing that the turn is made for speeding, the drivers will take every risk and will be sure to meet with accidents; whereas, if the turn is left in its natural condition, prudence will be observed. This was proved in last year's Grand Prix, the banked turn near Le Mans being productive of several minor accidents, while the sharp unprepared turns were all taken in safety.

In addition to the tire and gasoline station at the grand stands, there will be an auxiliary tire station at some point about half the distance from the starting point. This station will be confined strictly to tires.

Deliquescent Salts to Prevent Dust.

M. G. Le Roy, professor of chemistry at Rouen, has brought before the Sporting Commission the value of deliquescent salts (chloride of calcium or chloride of magnesium) as a means of rendering the course dustless. Last year the Sarthe circuit cost \$11,000 to tar, and was not satisfactory; as the Dieppe course could be rendered dustless by the use of deliquescent salts for the sum of \$1,000 there is every probability of this process being adopted.

A sum of \$2,000 has been voted by the Commission départementale for the improvement of the road between Dieppe and Londinieres. This stretch, bordered by the local railroad, is at present the weakest point of the course, but so much attention is being given to it that on the day of the race it will be as fast and as safe as any other portion of the circuit. One of the valuable features of the Dieppe district is that the local authorities are all willing to aid in putting the roads in racing condition at their own cost.

King Edward May Attend the Grand Prix.

Rumor declares that a well-known sportsman, a personal friend of the King of England, is endeavoring to obtain the presence of Edward VII at the Grand Prix. No response has yet been given to the invitation, but as details have been studied the belief is expressed that an acceptance will be given. His Majesty would come on his private yacht, sleep on board in Dieppe harbor, travel to the course by automobile, and leave immediately the race was over.

Albert Clement on a 50-horsepower Bayard-Clement, George Heath on a powerful Panhard, Garcet on a Bayard-Clement racer, and Degrais on a Germain have all spent some time on the course during the past week. They all declare themselves satisfied, and predict a high average speed.

Fiat and Itala have officially declared that they will not enter for the Grand Prix. Entries at double fees will be received until April 15 for both the Grand Prix and the Sporting Commission Cup, but it is not expected that any firm will take advantage of the delay.

Mr. Stead, the American racing man of Paris-Madrid fame, has introduced motor taximeters into Monaco in the shape of three-quarter landaulets well upholstered, with electric lighting. The charges are three francs for the first and one franc for each additional kilometer

THAT "INVASION" OF AMERICANS.

After throwing mud at each other for a few days, the editors of the two most important Parisian daily automobile journals appear to have arrived at a common understanding regarding the danger likely to arise from the "invasion" of the American automobiles engaged in the Gold Cup tour. *L'Auto*, the semi-official organ of the Automobile Club of France, now declares that if the tour assumed dangerous proportions it would be obliged to do all in its power to defend the national industry. Judging from some of the remarks, the national industry is a frail creature unfitted for the hard knocks of this wicked world.

The Marquis de Dion, head of the great De Dion-Bouton factory, one of the largest and oldest automobile factories in France, declares in his official capacity of President of the Chambre Syndicale de l'Automobile that it is impossible that a competition should be allowed on the soil of the *patrie* to be organized by foreigners and be reserved entirely for foreign cars. The Marquis fails to tell whether the loss of his American trade has influenced him. One firm, and one only, announces that the X & X machines are not afraid of the American invasion, and that they will match themselves against any competitors.

The French automobile public appears to be unaware of the fact that the invaders consist largely of those peaceful tourists whom they usually receive so heartily and feed so liberally. True, one frivolous Parisian suggested that the Yankee money-bags should be received with all the old world courtesy which was not lost during the Revolution, encouraged to distribute their dollars, to purchase jewelry, works of art, dresses, and everything else that France will barter for money; then, when their American machines are broken down—of course they will all break down—that they should be visited by smooth-tongued selling agents with real automobiles to sell. The hotel proprietor, who only knows that the Yankee brings a big pocket-book with him, thinks this good advice, and would follow it whatever the Parisian thunderers said.

But automobile France has a wider vision and sees in the peaceful travelers the forerunners of that invading host which some day might sweep away the dear national industry.

Georges Dupuy, who is carrying the burden of the work in arranging the Gold Cup tour of the American cars through Europe in July and August, reports nineteen entries up to date, with assurances that at least thirty cars will be obtained for the 4,000-mile journey through eight European countries. Mr. Dupuy is congratulating himself upon the excellent advance advertising which the tour is receiving in France. He is confident that before the cavalcade reaches French soil the makers of that country will realize how futile and uncalled for is any spirit of antagonism which seems to have been aroused through a lack of understanding of the real intent of the tour—that of giving Americans an opportunity of participating in a non-strenuous competition and at the same time seeing Europe in the most advantageous manner.

At a recent meeting of the Commission of Competitions of the A. C. F., called upon to give an opinion concerning the caravan of American automobilists, the Commission expressed itself of the opinion that, "not being international, this test is not a competition, and the results would have none of the guarantees which exist in every competition in which members of automobile clubs have the right to take part."

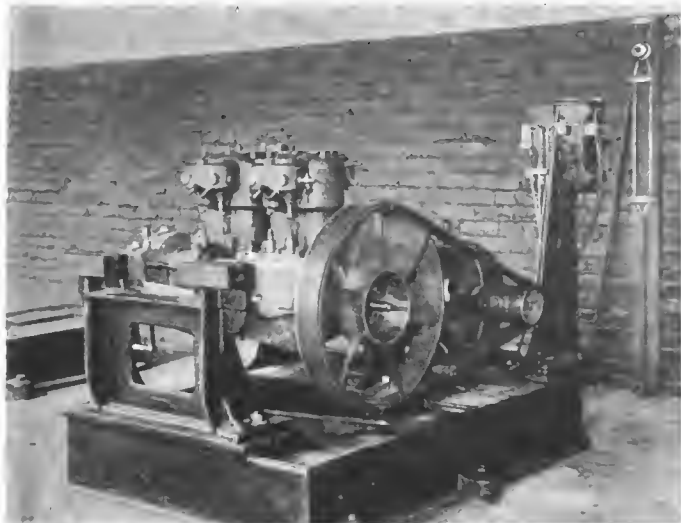
GERMAN AUTO CLUB IS FLOURISHING.

The annual meeting of the Imperial Automobile Club of Germany proved that the club has prospered exceedingly, and has now a very formidable members' list, consisting of 7 life, 1,106 ordinary, 334 extraordinary, and 34 lady members. The whole of the retiring executive board was re-elected and Count Arco and Dr. Veit newly appointed to the same, which is now made up of the Duke of Ratibor, Prince Hohenlohe, Baron Brandenstein, Count Sierstorff and Herr Goldberger.

RADICAL DEPARTURE IN AUTO MOTOR TESTING

THERE has been installed in the motor testing department of the American Locomotive Automobile Company, at Providence, R. I., makers of the Berliet car, an innovation consisting of a hydraulic brake, which absorbs and accurately measures the brake horsepower developed by the motors. After assembling, the motor is placed on a "jigging" stand and driven by a variable speed electric motor, for the purpose of polishing the bearings,

read pounds, and, by means of a vernier, one-tenth pounds, a sliding weight being moved along the beam by means of a screw and hand wheel, so arranged as not to disturb the balance. The leverage of the beam is so calculated that at 1,000 R.P.M., one pound represents one horsepower, and proportionately, more or less, according to the speed. One-tenth pound read on the vernier, therefore, represents one-tenth horsepower at 1,000 R.P.M., and is proportionate at varying speeds. The pounds pull thus registered is proportionate to the torque of the motor, and by dividing this figure by a constant, the torque at one foot radius can be readily determined.



CLOSE VIEW OF MOTOR ON TESTING BED.

pistons and other wearing parts, and reducing their friction to a point where it is safe to run the motor under its own power. The variable speed electric motor lends itself admirably to this purpose, as it permits beginning the operation at a very low speed and gradually increasing to a speed approximating that of the motor when run under normal conditions. During this period all wearing parts are flooded with oil, and closely watched to guard against excessive and injurious heating.

After the satisfactory termination of this operation the motor is transferred to the test stand proper to be run under its own power. The test stand consists of a heavy cast iron bed plate, supporting the hydraulic brake at one end, and with suitable brackets adaptable to the different size motors at the other. Flexible connections are used for water, gasoline and exhaust pipes to facilitate coupling up and dismantling the motor.

At first the motor is run with no load, and any adjustments necessary in the carbureter or ignition apparatus are made. After being well limbered up, a load is then applied by the brake.

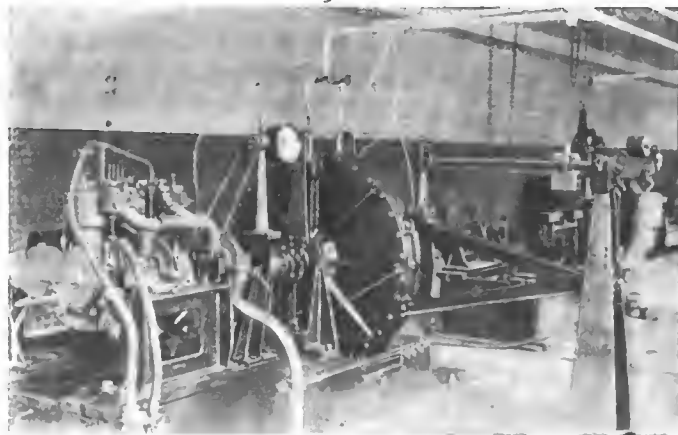
Details of the Hydraulic Brake.

This consists of a casing, or stator, provided at each side with trunnions, supported by segment struts, which in turn rest upon knife edges. The rotor consists of four steel discs 40" in diameter and 1/4" thick, securely keyed to a substantial shaft driven from the motor by a universal jointed shaft and multiple disc clutch. The brake discs revolve in four separate compartments within the casing, but clear the walls in all directions by 3-8", the only metallic contact between the rotor and stator being in the bearings which carry the shaft. The casing is free to revolve through a very small fraction of a degree, its movement being absolutely without friction because of the manner in which it is supported. From the periphery of the casing an arm projects, the end of which is linked to a steel beam supported on knife edges by a pillar in the same manner as the beams of platform scales, the whole forming a compound lever, corrected for balance by an adjustable weight. The scale beam is graduated to

How Readings Are Taken.

When it is desired to take a brake reading, the spring-actuated multiple-disc clutch is permitted to engage gradually, the brake discs then being driven by the motor. Water is admitted to one of the end compartments near the shaft, and its flow regulated by an ordinary globe valve. Centrifugal force carries the water out to the periphery of the disc, creating an enormous pressure, the water serving as a friction medium between the steel disc and walls of the compartment, the result being a tendency of the casing to rotate with the discs in direct proportion to the friction, and hence to the torque. Whatever friction results from the rotation of the shaft in the bearings of the brake casing, has a tendency to revolve it in the same direction; therefore, the entire power developed by the motor is accounted for by the weighing apparatus, which counteracts the tendency of the casing to rotate. It will be seen from this that no losses occur in the transmission of power from the motor to the brake, and readings are accurate to within a small fraction of 1 per cent.

If one disc or compartment is not capable of absorbing the total power of the motor, the compartment at the other end of the casing can be brought into service, and the water in these compartments may be transferred to the inner compartments by means of by-pass valves, thus bringing all four discs into use and absorbing the maximum power of which the brake is capable. By varying the quantity of water in the compartments a very flexible control is obtained. This is done by regulation of the



COMPLETE APPARATUS READY TO OPERATE.

inlet and outlet, or drain valves. The mechanical energy of the motor is converted into heat inside the brake, and is carried off by the water, the temperature of which is usually kept below 150 degrees F. The larger motors developing greater horsepower, and, in proportion, a greater amount of heat, require that a greater volume of water pass through the brake in a given time.

As the only available water supply at the American Locomotive Automobile Company's plant is from the city mains, means are



VIEW OF THE SECTIONAL RADIATOR AND BLOWER.

provided for cooling the brake water, as well as the jacket water from the motor cylinders, and using it over and over again. It is returned by pumps through a series of radiators, cooled by air from an electrically driven fan, to storage tanks, from which it runs by gravity again to the motors and brakes. The radiator tubes are arranged in parallel and controlled by a series of valves, in a such a way that any number of sections can be made inoperative, thus providing a means for maintaining a constant temperature of water supplied to the brakes and cylinder jackets, regardless of varying atmospheric conditions.

Advantages of the Hydraulic Brake.

Aside from its flexibility, one of the chief merits of the hydraulic brake is its constancy, and therefore its readings may be relied upon with absolute certainty. A tachometer belted from a pulley on the motor cam shaft gives the speed of the motor at all times, and during the test readings are taken at regular intervals of the pounds pull and speed indicated, and a record of the performance of each motor kept. These records are filed away for reference and may be seen by purchasers. The conditions to which motors are subjected when on test are as nearly as possible analogous to those met with in actual service, which are desirable from many points of view.

A spacious room is specially equipped to facilitate the work of motor testing. A traveling crane lifts the motors from the shop trucks to the stands and vice versa, and transfers them from one part of the room to another. The exhaust is led into

an underground pipe, with an outlet at some distance from the building. The gasoline tank is buried at some distance from the building, and gasoline is supplied to the test room in the safest manner. A small sheet iron house erected over the main supply tank contains a small tank holding about three gallons, and placed somewhat higher than the carbureters of the motors being tested, connection being through underground pipes. Gasoline is supplied to the small tank by a centrifugal pump at the bottom of the main tank, driven by an electric motor, controlled from the test room.

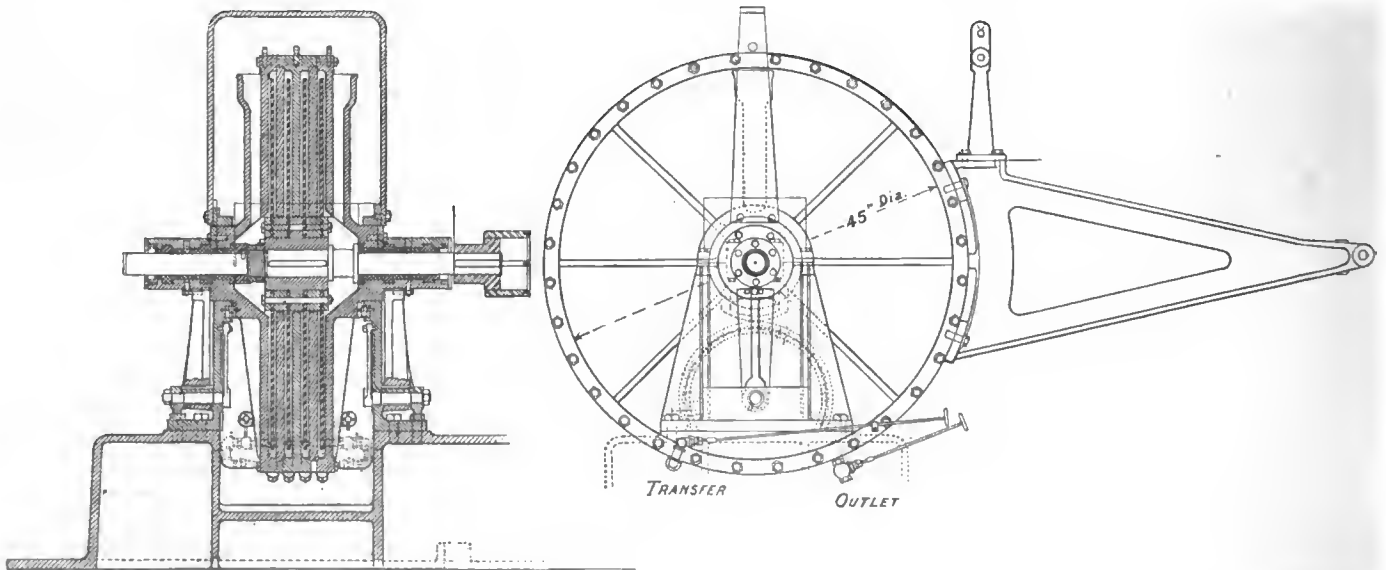
In case of fire the fuse in the motor circuit would burn out, only permitting the fuel in the small tank to flow into the room, should the carbureter connections be severed.

HARTFORD COMPANY MAKES MANY CHANGES.

In addition to the resignation of Secretary Gilson, as recorded last week, many other changes in the personnel of the officers of the Hartford Rubber Works Company resulted from the last meeting of the board of directors. Thomas Midgley resigned as president to devote himself entirely to the interests of the Midgley Manufacturing Company, of Columbus, O., of which he is the head. His successor is J. D. Anderson, who only resigned the vice-presidency of the Hartford company several months ago to accept the presidency of the G & J Tire Company, Indianapolis. V. B. Lang, who succeeded him at the time, has been re-elected vice-president and also appointed general manager, while H. Plow was elected treasurer, and E. R. Benson, formerly manager of the company's Boston branch, was elected secretary.

WHO INVENTED THE MOTOR SCOOTER?

A new invention is never produced without its originality being contested. Nathaniel Roe presented a motor scooter a few weeks ago which seemed to have solid claims to originality. It appears now that Roe was not the first to travel over the ice in a motor-driven boat. During the winter of 1904-5 Chas. G. Ketcham, of Eastport, L. I., fitted an ordinary scow with a two-cycle, 3-horsepower gasoline motor, connected direct by a belt to a large spiked wheel mounted forward of the motor and adapted to engage the ice through a slot in the floor of the boat. The motor scow was steered with a sharpened steel rudder blade on the end of a long sweep. Ketcham's craft seems to have embodied the same ideas as were presented recently by Roe, but in a rough and unfinished manner.



CROSS SECTION AND LONGITUDINAL ELEVATION OF THE AMERICAN LOCOMOTIVE COMPANY'S MOTOR TESTING PLANT.



H. I. CASHMAN ASSISTING FLOODED FOLK IN ALLEGHENY, PA., WITH HIS WHITE STEAMER. STREETS NEAR RIVERS WERE OVERFLOWED.

AUTOS AGAIN PROVE INVALUABLE.

If there were ever any motorphobes in the downtown district of the city of Allegheny, Pa., they probably revised their ideas after the great flood of last week. Never were means of swift and sure transportation more needed than when the rivers commenced to overflow their banks and to inundate a part of the residential district. Although warnings there had been in plenty that a flood was imminent, it was not until the water commenced to course through the streets that people thought of abandoning their homes and seeking shelter on higher ground. Then they found that the means of escape at hand were hopelessly insufficient. Those who had obtained possession of rowboats were charging \$5 a head to carry people to places of safety. Empty boxes, planks and all kinds of household furniture were pressed into service as rafts. In many instances these frail craft were swept out into the river, with the result that over twenty lives were lost in this way in the vicinity of Pittsburg alone.

The flood of the three rivers reached the height of 36.2 feet, more than a foot higher than ever recorded before. Automobiles were about the only vehicles to be seen in dozens of submerged streets, and they performed their service so well that it has been suggested that the Pittsburg police department keep an exact record of the location of every big garage in the city, so that in flood times they might call on the managers for autos in extreme cases. These owners and managers, by the way, showed a measure of public spirit last week that has never been equaled in Greater Pittsburg. In their own way, and unaided, they organized an automobile service that gave direct and timely aid to hundreds of business men and women.

H. I. Cashman, with a White steamer, was one of the earliest arrivals on the scene in Allegheny, having crossed the bridge merely out of curiosity. Finding need of his services, he immediately went to work, and from along the water front carried many loads of people to places of safety. The Banker Brothers had a car carrying twelve persons running back and forth, and excellent service was provided by the Winton and Darracq branches, and the Colonial and others were equally helpful.

THAT BOSTON TO NEW YORK MOTORWAY.

Boston, March 19.—Many prominent automobilists attended to-day's hearing before the Roads and Bridges Committee of the Legislature in reference to the proposed motorway from New York to Boston. The estimated cost is \$70,000 per mile, total length 172 miles, and cost of construction about \$15,000,000.

RECENT RAMBLER NON-STOP RUN.

Van Evra B. Martin's 2,000 miles non-stop run on a Rambler machine was privately undertaken to prove that a stock machine was capable of a 1,000-mile trip without stopping the motor and without any particular preparation. The road conditions were the worst possible for such a trip. The engine was cranked by Sherburne M. Becker, mayor of Milwaukee, and the car was driven by Mr. Martin himself. The total time between the starting of the motor and the handing over of the engineers for a thorough examination of the parts was 168 1-2 hours, of which time the car had been on the road approximately 153 hours. Total mileage covered was 2,281, and the total distance covered up to the time of stopping the motor was 2,002 1-2 miles. The running time of the motor was 140 hours and 36 minutes.

For the two thousand miles run 137 1-2 gallons of gasoline were consumed, thus the mileage was 14 1-2 miles per gallon. The oil consumption was 19 1-2 quarts. Figuring the gasoline at 18 cents per gallon, the present retail price in Milwaukee, and the lubricating oil at 50 cents, the fuel cost aggregated \$24.75.

Hartford-Dunlop tires, with Midgley treads, were used and held up particularly well in view of the road conditions.

On the completion of the trip the car was entirely dismantled and publicly examined by Vigil Oldberg, M.E., of the Armour Institute of Technology, and Edward B. Waite, head of the instruction department of the American School of Correspondence. It was found that the entire replacement of parts showing wear would cost, including time, but \$7.50.



HOW THE ROADS WERE ON RAMBLER NON-STOP RUN.

GUSTAVE CHEDRU JOINS THOMAS COMPANY.

A valuable addition has been made to the engineering department of the E. R. Thomas Company, of Buffalo, by the appointment of Gustave Chedru as its head designer. Some intimation of the personnel of this corps was given when it became known that Gustave Caillois, late of the Brasier factory, was at the head of the



GUSTAVE CHEDRU.

Thomas racing team on the Vanderbilt cup course. The other members of the department were not, however, made known. Prior to joining the Thomas interests M. Chedru was technical manager and consulting engineer with the Société des Automobiles Théry. He began his designing career eighteen years ago with the Continental Edison Company, later becoming designer for the Compagnie Electrique Théry. During his fourteen years connection with gasoline engines he has been designer for the De Dion-Bouton firm, chief engineer with the Richard-Brasier factory, and superintendent with the Bayard-Clément company. Mr. Chedru is the designer of the Brasier racing machines which won the Gordon Bennett Cup two years.

HARRISON WAGON COMPANY REORGANIZED.

GRAND RAPIDS, MICH., March 18.—The Harrison Wagon Company, manufacturer of automobiles, and the Harrison Land Company, have been reorganized with the following acting as directors in both companies: J. R. Wylie, C. H. Hollister, Mark Norris, Maurice Shanahan, and H. W. Marsh. These directors elected the following officers for the wagon company: James R. Wylie, president; Clay H. Hollister, vice-president; Mark Norris, secretary and treasurer. This action was taken to give the entire control of the Harrison properties to the creditors. The automobile department of the factory will be continued.

RUNNING DAY AND NIGHT FOR TWO YEARS.

CHICAGO, ILL., March 18.—W. Hildreth, manager of the Holman Automobile Company, states that recently 15 cars were shipped in a single day and 35 cars was the total for the week. The factory has been in operation day and night for the past two years, and there appears to be no signs of a let-up, in view of the many orders that await delivery.



"BOB" ALEXANDER TESTING POPE-HARTFORD.

In all kinds of weather Pope-Hartford cars are given severe trials in the neighborhood of the factory. "Road King" Alexander is doing Newington mountain near Hartford, Conn.

DETROIT PRODUCES A NOVEL COMBINATION

DETROIT, MICH., March 18.—Rodolphus Fuller, a resident engineer of this city, has just completed the first one of a new type of motor trucks designed particularly for heavy haulage. As will be plain at a glance from the picture of the new machine, it departs from the conventional vehicle of this class in a number of respects. It is a combination gasoline-electric wagon upon which Mr. Fuller has received patents. The power plant consists of a four-cylinder, 40-horsepower gasoline engine, direct-connected to a multipolar direct-current generator of the standard type, and is located in a sort of housing the top of which does duty as the driver's seat.

The actual driving equipment consists of two electric motors, one of each of which is carried on the front and rear axles in connection with a differential. The controller is somewhat similar to the type used on street cars and gives the different speeds by varying the amount of current passing through the field windings of the generator, any speed up to a maximum of six miles an hour being available either forward or reverse. The control may be further varied by applying the power to either the front or rear motor separately or to both simul-



NEW GASOLINE-ELECTRIC TRUCK FOR HEAVY WORK.

aneously. A turntable type of front truck is used in preference to the usual knuckle style of guiding the vehicle in order to obtain a sharper turn, a turning radius of little more than its own length being claimed for this vehicle. Ball bearings are used to reduce friction on the turntable, while an indicating pointer shows the driver exactly the direction the front wheels are heading at any time. The machine runs on steel-tired wheels, and to refute the criticism that has arisen on this point, it is said that the inventor has demonstrated that the tires have sufficient traction by running the car through deep mud. The carrying capacity of the truck is seven tons, and its weight 3,850 pounds, or just 55 per cent of its effective load, allowing an unusually high efficiency. A company is being organized to manufacture the new trucks, which will be placed on the market at \$5,000.

LONG ISLAND MOTOR TRADE ASSOCIATION.

Following a preliminary meeting of a number of prominent agents and dealers in Brooklyn a fortnight ago with a view to co-operation, a meeting was held at the Imperial on the evening of March 14, and as a result the Long Island Motor Trade Association was organized. E. H. Barnum, Ormond Company, was elected president; L. H. Allen, I. S. Remsen Mfg. Co., vice-president; B. D. Underhill, Brooklyn Motor Car Supply Company, treasurer, and D. D. Martin, New York Broadway Tire Company, secretary. Fifty dealers were present, and numerous others wrote signifying their intention of joining the association, something of a surprise being occasioned by the election of the Standard Oil Company to membership.

BRIEF ITEMS OF NEWS AND TRADE MISCELLANY

The Mitchell Auto Company has been organized to handle the Glide line of cars in St. Joseph, Mo., and vicinity, and will keep a full line of Glide machines of the different models in stock.

The placing of vanadium steel on a commercial basis enables American automobile makers to produce machines that are unsurpassed in any particular by cars made in Europe, declares Henry Ford.

The National Electrical Supply Co., of Washington, D. C., wholesale and retail dealers in automobile tires and accessories, has been authorized by the state corporation commission of Virginia to increase its capital stock from \$100,000 to \$200,000.

The Alamo Engine Works, of Hillsdale, Mich., is engaged in erecting an additional machine shop, 127 x 40 feet. The building will form a unit of the group plan which the factory will require for its business. The company's business is rapidly increasing.

Capitalists are at present interested in a proposition from C. H. Brooks, of Detroit, for the establishment of an automobile factory at Port Huron, Mich. The new factory would manufacture the "Brooks" car, a new machine which will be placed upon the market this year.

Having decided to purchase automobiles for the use of its inspectors, the Bureau of Highways of New York City decided upon the Model E four-cylinder Mitchell as the most satisfactory car for their requirements. The purchase was made through the Mitchell Motor Company, of New York, at 1787 Broadway.

Charles Clifton, treasurer of the George N. Pierce Company, of Buffalo, believes the six-cylinder car to be the best thing for high power cars. His view is that the six-cylinder engine has proved its superiority to the satisfaction of engineers, and that users will adopt this type as fast as they become acquainted with its real merits.

After running the round of all the big shows the Lozier 40-horsepower motor inclosed and operated in a glass case, is about to be shipped to the Lozier headquarters at Fifty-fifth street and Broadway. This motor has sections cut from the cylinders, valve chambers, etc., enabling the observer to see the inner working and operation of the engine.

D. L. McDonald, a Texas real estate agent, finds his Winton invaluable in making land sales. "If it were not for this car," he says, "I simply could not do business, for our land is so far away from railroads and trolleys, and I have yet to find a team of horses that could handle a load of seven passengers at the speed and over the grass-grown country that the car can easily negotiate."

Owing to a typographical error in the Warner Instrument Company advertisement in the March 7 issue of THE AUTOMOBILE, what was really a very creditable showing for that well-known instrument in the Glidden tour was made to appear of only passing interest. The original copy read that thirty eight instead of eight of the sixty-two Glidden tourists had their cars equipped with Warner Auto-Meters.

One of the most important orders received by the Hartford Suspension Com-

pany came last week from the Olds Motor Works, which sent in a preliminary order for 100 sets of Truffault-Hartford shock absorbers to be used as equipment on their high-speed gentleman's roadster. This adds another big manufacturer to the sixteen already in line who consider the shock absorber a necessary addition to their cars.

One of the most uniquely finished automobiles turned out has just been delivered by the E. R. Thomas Motor Company, of Buffalo, to O. P. Letchworth of that city. The car is a silver plated Thomas Flyer, all of the exposed brass parts on the car having been coated with silver, giving it a rather dazzling appearance. The use of silver by Mr. Letchworth is not a fad, but has been adopted by him owing to the fact that he believes it can be kept clean much easier than brass.

Some misapprehension has arisen regarding a notice made in THE AUTOMOBILE of March 7, dealing with the occupancy by the Buick Company of a portion of the Winton branch at Chicago. Some time ago the Buick Company leased for two months a section of the second floor of the Winton premises, this section being separated by a brick wall. As a matter of fact the Winton Company uses the entire first, second and third floors and basement of the Winton branch at Chicago.

The first 1908 American Mercedes built in the new factory of the Daimler Manufacturing Company, of Long Island City, has been sold to the Garden City Company, of Garden City, L. I. This will be the first 1908 German Mercedes model, as the American Mercedes is made from the latest blue prints furnished from the parent factory in Germany. The Garden City Company is practically the Stewart estate, and the new garage this corporation intends constructing on its land this spring will be one of the finest in America.

Mrs. William K. Vanderbilt, Jr., has recently purchased one of the new White Steamers. This car will be the third successive model of this make which she has owned. Mrs. Vanderbilt is at present in Europe and the order for the car was given to the White garage in New York by her sister, Mrs. Herman Oelrichs. Mrs. Vanderbilt has always shown a marked preference for the White, and this is the only make which she essays to drive herself. She is frequently seen scurrying along the Long Island highways.

The plant of the Tweedale Foundry and Machine shop, at Constantine, Mich., has been taken over by the Constantine Manufacturing Company, organized by Charles Cohn, Constantine; C. E. Fousel, Centerville; Luther Sevison, Port Huron, and D. L. Chipman, Peoria, Ill. The new company will manufacture the Sevison sparker for gas engines. It is attached to the flywheel and is said to be able to furnish the necessary spark for an indefinite time. Plans are also under consideration by the company for the manufacture of several other electric articles.

An employment bureau has been opened by the American Motor Car Manufacturers' Association which it is expected will prove advantageous to its members. Good men are hard to get and it is felt that a central bureau where applications could be received either for men or for positions would work

out well. This move is the result of numerous applications having been received for sales managers, factory superintendents, salesmen and demonstrators. All applications for positions are placed in the employment department, and are held confidential. They should be addressed to Alfred Reeves, general manager, 29 West Forty-second street, New York.

An excellent method of educating owners of Maxwell automobiles on the construction and care of their machines is being adopted by the Maxwell company. A textbook has been compiled consisting of a series of eight lectures arranged in sequence. The first lecture deals with everything in the most elementary manner and makes the subject clear to even the most ignorant. Later lectures deal with the technical features of the automobile, the text being made clear by numerous diagrams. The last lecture discusses many points of value on the cost of upkeep of a Maxwell car. The book has been prepared under the care of A. A. Grant, author of "The Making of an Automobillist."

An enthusiastic autoist who has his Columbia car provided with three styles of bodies, writes: "Before purchasing my car I had little idea of the wide variety of service that can be obtained by going to the expense of extra bodies. During the early spring I fit the car with a touring body which seats the whole family. In the summer, when most of the family is at the shore, I substitute a runabout type. My son and I drive to work every morning, a distance of ten miles. On Saturdays we drive to the shore, fifty miles away, and remain there over Sunday, when other members of the family make use of the car. In the early fall a touring body is again fitted to the chassis and is provided with a cape top having side and front curtains, affording ample protection from the elements. In the winter a limousine body is fitted which is especially desirable for the trip to and from the office and for the ladies of the family for shopping and calling. Thus my car is made to serve the purposes of a good stable of horses. I have found the investment a good one."

NEW AGENCIES ESTABLISHED.

John T. Fisher has opened an agency in Chicago for the Mercedes Import Company, at 319 Michigan avenue.

The Southern Automobile Company of Asheville, N. C., has taken the agency for the Rambler for Western North Carolina.

The Motor Car Company of Washington, D. C., agents for the Peerless, Thomas, and Stevens-Duryea, has also secured the Buick agency.

In the issue of THE AUTOMOBILE, March 14, it was stated that the firm of Banker Brothers of Pittsburg had taken up the agency for the Aerocar. This was an error. Banker Brothers are agents for the Autocar.

The F. B. Stearns Company, Cleveland, O., makers of the Stearns, has placed agencies with the following houses recently: Wilson Automobile Company, 118 St. Lawrence avenue, Wichita, Kans.; N. E. Peterson, 1520 Belmont avenue, Seattle, Wash.

The Reliance Motor Car Co. has made agency connections with the Fiss, Doerr &

Carroll Horse Company of New York, a corporation handling more horses than any other firm in the world. It is significant that they should show their progressiveness by being one of the first to take up the motor truck.

The Supplementary Spiral Spring Company, 4524-4526 Delmar avenue, St. Louis, Mo., has opened a branch in New York City at 52 West Sixty-seventh street, and Allen McKenzie has been placed in charge. Mr. McKenzie is well equipped to interest the Eastern trade in the springs made by his company and expects to develop the already large demand for them in metropolitan automobile circles.

Joseph L. Keir, the agent for Michelin tires and Rerault machines in Philadelphia, has just opened at 1437 Vine street one of the most complete tire repair works in the country. The factory, which is operated by steam and electricity, is equipped in the most complete manner. The foreman has come from the factory of the Michelin Tire Company in France and will introduce the repair methods so successful in that country.

For the convenience of the trade in Pittsburgh and vicinity the Diamond Rubber Company has established a general agency for its tire and accessories at No. 16 Wood street, that city. This new tire establishment occupies a part of the quarters of the Pittsburg Rubber and Leather Company, which concern has for many years been the agents for Diamond mechanical rubber goods in that territory. A complete stock of tires of all types and sizes will be carried.

RECENT TRADE REMOVALS.

This week the Philadelphia agency for the Knox moved into its newly fitted quarters, 510-512 North Broad street.

The Henshaw Motor Car Company, Boston agents for the Haynes and Columbus electric, has moved into its new store at Massachusetts avenue and Newbury streets, that city.

McDonald, Titus & Co., central Ohio agents for Reo and Mora autos, have leased the four-story building, 61-63 Spring street, Columbus, and will occupy it in its entirety, removing from 138-140 Spring street, where they have been located for several years.

PERSONAL TRADE MENTION.

Freeman L. Loomis has been appointed sales manager of the Reliance Motor Car Company. Mr. Loomis was for twenty years the most active field organizer of the Aultman & Taylor Machinery Company at Mansfield, O.

A. J. M. Edwards, who has been connected with the Electric Vehicle Company since 1899, has been placed in charge of the New York branch, succeeding W. W. Burke, who was recently elected president of the Motor Parts Company.

W. T. Helfer, for many years manager of the Boston branch of the Diamond Rubber Company, and well known throughout the New England States, has joined the Springfield Metal Body Company's selling forces as sales manager, with offices at Springfield, Mass.

"Mike" Costa, a power in Philadelphia cycling trade circles in the last century, has embarked in the automobile business. He has formed the M. J. Costa Motor Car Company at 2117-2121 North Broad street, where he will handle the Bayard-Clement machine in Philadelphia and neighborhood.

R. C. Wright, for the past two years general foreman of the machine and model departments of the E. R. Thomas Motor Company of Buffalo, has accepted the position of general superintendent of the Auto Car Equipment Company of Buffalo, manufacturers of gasoline and electric trucks and sightseeing vehicles.

Thomas S. Witherbee, formerly president of the Witherbee Igniter Company, has engaged in a new business enterprise. He has organized the Witherbee Manufacturing Company, with factory and offices at 433 West Forty-second street, New York City, and will make a new storage battery and several other ignition specialties.

The Dolson Automobile Company of Charlotte, Mich., has made arrangements with F. G. Bremer to take the position as assistant general superintendent of its factory. Mr. Bremer comes from the American Mercedes Company of New York, and previous to his association with that company he was with the Pope-Toledo Company of Toledo, O.

President Percy Neel of the Quaker City Automobile Company of Philadelphia has secured the services of Charles P. Soules, the well-known racing man, to look after the interests of the Pope-Toledo car in that city. In view of the rather comprehensive program of races, hill climbs, endurance runs, etc., outlined by Philadelphia club enthusiasts for the coming season, it is expected that with Soules to guide them the Pope-Toledos will be heard from with considerable frequency.

RECENT TRADE PUBLICATIONS.

Westbrook generators are dealt with in the little folder issued by E. T. Kimball Company of Boston, Mass.

The Stackpole Battery Company of St. Marys, Pa., has issued a folder dealing with their various types of dry cells for automobile and telephone work.

"The Power Behind" has the quality of originality. It deals with the power behind the Wayne automobile, but the way the manner is presented in the little booklet is rather out of the common.

York Pullman automobiles are entertainingly dealt with in the catalogue issued by the York Motor Car Company of York, Pa. The different models are described in detail and illustrated by numerous half-tone cuts.

"Expert Testimony on Springs" is the title of the booklet published by the Perfection Spring Company, 251 Superior viaduct, Cleveland, O. Copies of letters from expert users of the firm's springs are given.

The Gilbert Manufacturing Company of New Haven, Conn., has issued a folder dealing with their Gilbert helmet and the Gilbert Poncho, desirable articles for use in stormy weather, and have also sent out an advance catalogue of their complete lines for 1907.

The Supplementary Spiral Spring Company issued recently a sixteen-page booklet with cover in two colors, which illustrates graphically five different methods of attachment of supplementary springs to cars of different models. The booklet also contains considerable other information, as well as many testimonials to desirable features of this equipment.

"The American Truck" is the title of a pleasing catalogue issued by the American Motor Truck Company of Lockport, N. J. It has been gotten up in the best style known to the typographical expert and very

graphically shows the engine, mechanical parts, complete chassis and fully equipped vehicles for various loads and different classes of business constructed by the American Motor Truck Company.

Owing to the large size and the many articles illustrated, the publication of the 1907 catalogue of Automobile Supplies by the New York Sporting Goods Company, 17 Warren street, New York, is a little later this year than usual. They announce, however, that their "big book" is now ready and everyone is invited to write for a copy. This company has for years made a specialty of the bicycle trade and are probably the largest handlers of these goods in the east. They control many valuable agencies, including the Pittsfield Spark Coil Company's goods and Hudson bicycles for the Middle Atlantic States. The automobile supply catalogue is known as No. 37 and the bicycle catalogue as No. 38, and they may be had without charge on application.

The Cleveland Motor Car Company's catalogue combines a description of what the car is and what it does. The former is related in text and excellent half-tone illustrations and the latter is an account from the pen of Walte Hale of a run from Gibraltar to the coast of Normandy in a Cleveland car. It is a racy written description of a unique tour and is embellished with photo engravings and pen sketches of scenes in romantic Spain and historic quarters of France. The account of the tour will interest every man who possesses anything of the roving spirit, whether he has any love for carbureters and coils or not. The analysis of the Cleveland machine is so skillfully done that even the indifferent should find it attractive.

A PHENOMENAL GROWTH.

Though young in years as compared with other industries, the business of supplying, or rather, jobbing, automobile parts and accessories, is one of the most solidly founded in the country to-day, and not the least of its husky infantile representatives is the Neustadt Automobile and Supply Company St. Louis, Mo. From a diminutive, though vigorous beginning, this company has gone forward with such strides as now to occupy a place all its own in the automobile economy of the Middle West, and from the Mississippi to the



Coast. The accompanying illustration gives but a poor idea of the extent of the establishment now occupied exclusively by this concern, which has made a practice of "supplying everything for the automobile" ever since it started, and not content with living up to its motto in a manner equaled by few, has now added a full line of motor boats and accessories in the shape of an independent department devoted to this line. The company anticipates a most successful season, and with the aid of the recently enlarged facilities expects to attract a larger number than ever of tributary buyers to their natural market—St. Louis.

INFORMATION FOR AUTO USERS.

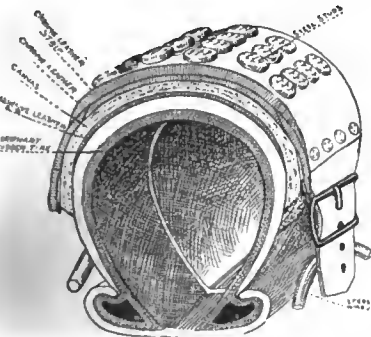
Woodworth Treads and "Kant-Skid" Grips.—The 1907 Woodworth tread has a new method of adjustment, the side wires being made of spring steel crimped or wavy in shape, so that they are self-adjusting and take up the slack automatically. The covers have short straps along the edges, with buckles having hooks on the back to hook



WOODWORTH TREAD ATTACHED TO TIRE.

over the wires. Adjustment for different size tires is made by arranging the buckles on the strap at the proper distance from the edge of the cover.

The nature of the "Kant-Skid" tire grip is self-explanatory. It consists of strips of chrome leather 1 1/4 inches wide, studded with steel rivets placed across the tire about four inches apart. A steel plate riveted under the studs protects the leather and gives additional durability to the device. The cross strips have rings at each end, connected by spring steel links, which can be snapped into place in one second. To make the skid bands fit different size



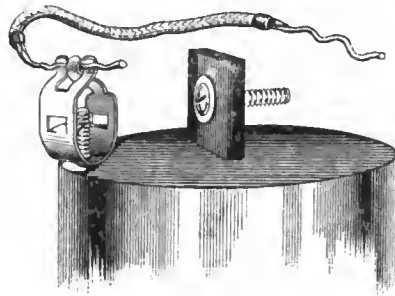
SECTION SHOWING "KANT-SKID" ATTACHMENT.

tires it is only necessary to add or remove one or more sections. The spring side links enable one to do this or to put in new cross pieces to replace worn ones. These straps across the tire present a soft surface to the rubber and cause no injury. They can be used equally well on solid tires without danger of cutting. Both of the above popular appliances are manufactured by the Leather Tire Goods Company, Newton Upper Falls, Mass.

"Oilers" for Wet Weather.—That old-time and well-tried waterproof garment, the Gloucester "slicker," has yielded to modern conditions. Instead of the shape-

less oilskins familiar to fisher-folk, we can now have stylish and well-fitted garments made from this material. There is also a new creation in an automobile reversible coat, made with one side of mercerized silk or khaki, and the other side of oil-coated muslin, giving a silky finish. The silk or khaki is left in its natural state, no oil or rubber being used, giving a garment for pleasant weather. The waterproof side, entirely free from the cloth side, is made of fine muslin coated with oil by the Boynton patent process, giving a soft, silky finish. This combination of silk or khaki for one side and a finely finished oilskin for the other gives a slightly garment for all kinds of weather. They are made by the Boynton's Improved Process Oil Clothing Company, Gloucester, Mass.

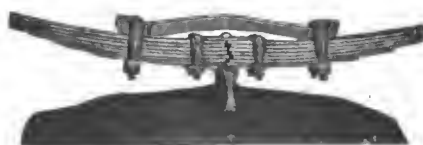
Handy Dry Battery Connectors.—A clever device that gives a good contact, a quick connection and a wire lock, all these conditions being inter-communicating, is the Standard battery connection. It is made from one piece of brass cut and die-shaped to give this service. At the bottom of the loop is a hole just large enough to permit easy passage over the threaded pole connections. About midway up each arm is an inwardly projecting lip. One arm



NEW DRY BATTERY CONNECTION.

has a slotted end and the other a finger end to form a dovetail joint. By passing the finger through the slot the midway lips act as locks on the threads of the terminal. The connecting wire bridges the dovetail ends, reacting against the locking lips below them, which in turn pull the dovetail apart, only to more securely hold the wire connection. These handy little connectors are made by the Standard Battery Connection Company, 27 Copeland street, Roxbury, Mass.

Emergency Spring Repairer.—Fortunately it is not very often that the automobilist has need of a temporary spring repairer, but when he does want it he wants it mighty bad. The engraving herewith explains clearly the nature of the spring repairer and its method of attachment. The cut is reproduced from a photograph of a broken spring and "Emergency Spring Repairer" which was attached to a five-pas-



EMERGENCY SPRING REPAIRER.

senger 35-horsepower car, which was run over 843 miles on all kinds of roads before the spring was replaced by a new one. The

appliance is simple and light and occupies so little space that it can be advantageously included in every equipment. It is made of steel and in sizes to fit every spring. When ordering, the width of spring clips is the only dimension that needs to be given. This appliance is being handled by the Emergency Spring Repairer Company, 5 Beekman street, New York.

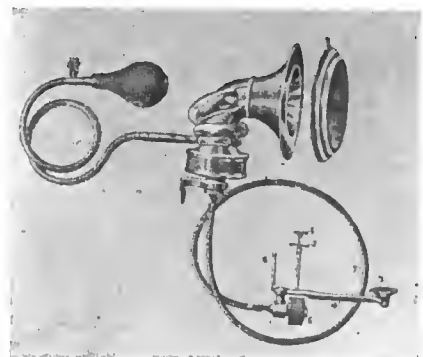
An Electric Lamp Lighter.—Using a jump spark gap to light the acetylene burners is the explanation of this device. The burner outfit has an insulating sleeve, which



NO-MATCH ELECTRIC LAMP LIGHTER.

supports the metal arms carrying the "spark points." The spark gap comes over the gas vent on the lava tip of the lamp. With one of the arms grounded, the other is wired into the secondary circuit of the spark coil. From the primary circuit a lead is carried to a push button at any point convenient to the driver. Pressing the button closes the circuit, a spark occurs across the gas vent and the lamps are "lit while running," the gas also being turned on from the seat. This hand device is manufactured by the No-Match Electric Manufacturing Company, 141 Milk street, Boston, Mass.

A Unique Town and Country Signal.—Leavitt's latest is a combination which is a clever uniting of a siren and a reed horn. Its ownership means the possession of a signal for country and night riding and a horn for city use. As indicated by the name, this is another of the Leavitt novelties, made by the Uncas Specialty Company, Norwich, Conn. The combination is arrived at in a manner both simple and ingenious. Around the throat of the siren portion are carried the coils of the reed part of the horn. At the bend of the throat



LEAVITT'S COMBINATION HORN.

the coil passes through the wall to its bell, which is placed concentric with and inside the siren bell, the two being closed in with the usual screen. Attached to the reed coil is the usual flexible tube and hand bulb. The flexible shaft attachment for the siren portion is particularly good. The shaft itself attaches at both ends by a simple jaw clutch and friction pulley is adjust-

able, and its bearing block resting in a broached hole it becomes positive at any position. The arm carrying this block pivots at its other end in a bracket, which screws to the under side of the floor boards. At the end in which is secured the bearing block the return spring is placed. There is also a free foot slinger for holding the pulley into contact with the fly-wheel.

The "Krackerjack" Jack.—Although closely resembling last year's model, the "Krackerjack" jack has undergone important changes. Pressed steel is now employed for the entire frame, giving mini-



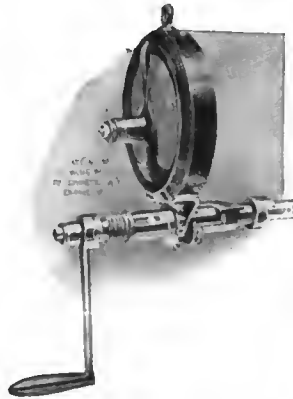
SIDE VIEW OF KRACKERJACK.

mum weight and maximum strength. The rack bar is of high-grade carbon steel, with the teeth milled out, thereby disposing of any liability to crack or break. The rack bar may be had with or without secondary lift. The internal mechanism is composed of drop forgings carefully ground and fitted, removable at will as if in one piece. A steel pin, provided with a shoulder on one end and a split pin on the other, supports the mechanism in the frame. Raising and lowering is performed in the usual manner, but as the lever handle is inserted close to the base increased ease of operation is secured. To reverse the action it is only necessary to make a one-eighth turn of the handle, thus allowing the load to come down slowly. The manufacturers and selling agents of the jack are the Utility Company, 332 Broadway, New York.

A Flexible Carbureter.—The main feature of the Palmbla carbureter, manufactured by the North Chicago Machine Co., is the departure from the accepted methods of producing carburetion by having the fuel aspirating nozzle in the air passage. The multiple jet fuel nozzle is placed above the air passage and mixing chamber and the intake valve is controlled by a calibrated compensating spring. Under such conditions the suction stroke of the motor causes a varied vacuum in the body of the carbureter, and is proportionate to the piston speed. This automatically governs both the supply of the air and the fuel, the mixture being constant under all speeds. The use of an auxiliary air valve is eliminated, as in this system the carburetion process is controlled wholly by vacuum

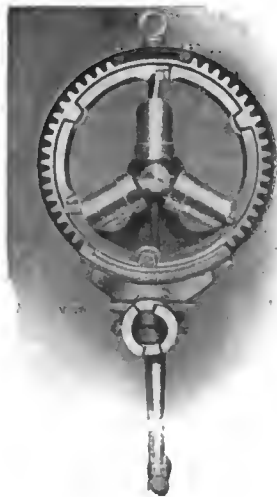
in the mixing chamber rather than by the speed of the air in passing the fuel nozzle. The makers claim that this carbureter is sufficiently flexible to meet the requirements of their convertible two or four-cycle motor.

A Novel Power-Driven Tire Inflator.—It has come to be a trite saying that more tires are ruined by lack of proper inflation than are ever worn out in use, for the pneumatic tire should be inflated to the pressure



SIDE VIEW, SHOWING CRANK.

it is designed to carry at all times. But with the increasing sizes now customary on modern cars the work of hand inflation has come to be so laborious that it is more often slighted than otherwise, with resulting punctures and rim-cutting. To remedy this a Chicago firm is placing on the market a compact and powerful inflator under the name of the "Rotary Triplex Tire Inflator." It consists of a small cylindrical casing mounted on the crankshaft bracket at the forward end of the radiator, and



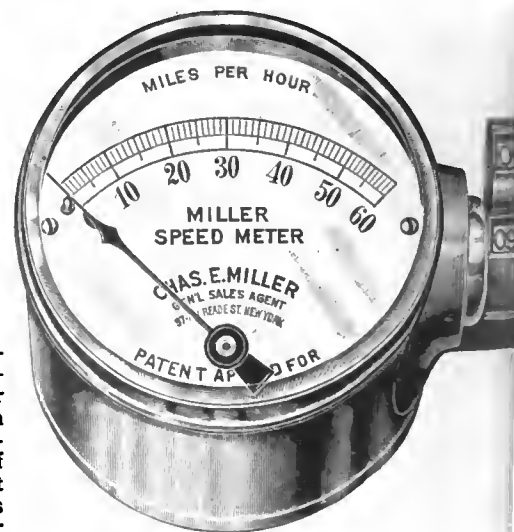
END VIEW WORKING PARTS UNCOVERED.

contains three short cylinders and a close-fitting annular gear running on three-point roller bearings, eccentric to the inner walls of the housing, to which the piston rods of the cylinders in question are attached by hinged joints. The rotation of the gear ring carries the cylinders about their axes with it, the air pressure thus generated is delivered through the cylinder heads to the hollow shaft on which they are mounted and from which a connecting tube is led to the tire to be inflated. The pump is permanently attached to the car and is put into action simply by shifting the position of a cotter pin before cranking

the engine to start. The same makers, Skinner & Skinner, 1337 Michigan avenue, Chicago, also list a handy pressure indicator for use in connection with the inflator. The illustrations show the small size and simplicity of this convenient pump.

Postal is the apt and expressive title of a new entrant into the field of what has come to be known as the "buggy-about." It is manufactured by the Postal Auto & Engine Company, of Bedford, Ind., and, as its name indicates, it is designed to be capable of that rough-and-ready service which calls for the almost infallible reliability of the postal service. The motor is of the double-opposed horizontal, four-cycle type, air-cooled, and is rated at 12 1-2 horsepower. The transmission is of the planetary type, giving two speeds forward and reverse with a final drive by steel cables. Suspension is by means of two semi-elliptic, inverted springs, 70 inches long, with their ends resting directly on the 1 1-4 inch square section steel axles. The muffler, carbureter and coil are of the best known makes, lubrication being effected by a standard automatic system. The running gear consists of 42-inch front and 44-inch rear Sarven patent wheels, shod with 1 1-8 inch solid rubber tires, brakes being placed on the transmission and the counter-shaft, the latter carrying the emergency. The total weight is 900 pounds and the speed up to 30 miles an hour.

Miller Speed Meter.—A twelve months' guarantee, provided the seal is not broken, is given with every Miller speed meter manufactured by Charles E. Miller, 97-101 Reade street, New York. This speed indicator will register as low as five miles an hour and up to sixty miles an hour, or 100 miles an hour if specially ordered. In addition to showing the rate of speed traveled at any given moment, an odometer attached registers the trip and gives a permanent record up to 10,000 miles. The interior mechanism works on centrifugal principle. The governor spindle is made of tool steel, hardened and ground to size, with fly balls and links of brass. The speed meter is made to be attached to the dashboard and is actuated by means of a flexible shaft and crown gear wheels at-



tached to the front wheel of car. The large gear to be attached to the hub is so made that it can be fitted to any of the domestic or imported cars without extra attachments or fittings.

THE AUTOMOBILE

A STATE UNIVERSITY WHERE
AUTOMOBILING IS TAUGHT.

By HAROLD W. SLAUSON.

IT may be that some day in the near future the meaning of the "A.B." degree will be changed from Bachelor of Arts to Bachelor of Automobiling. Cornell University in the past two years has introduced into its curriculum a practical course on automobile construction, which is practical in every sense of the word, so much so that the work is made extremely interesting as well as instructive. Professor Rolla C. Carpenter is the head of the Department of Experimental Engineering and a recognized authority on mechanical matters, and incidentally is the consulting engineer of a widely known company making steam automobiles. Cornell's automobile course consists of two lectures a week, given throughout the second half of the year, and every detail of the modern automobile is discussed.

The Course is Most Thorough and Complete.

The history of each part is thoroughly gone into, and the improvement in design, from its inception to present-day perfection, is carefully studied. The same method is pursued with the unsuccessful or discarded attachments, the reasons for their failure carefully investigated, and the young designer forewarned against "freak" innovations which have threatened to "revolutionize the motor industry." Of course, incentive for original research and design is given, but in such a way that it will lead through channels where the greatest good can be accomplished without going over the ground already trodden by unsuccessful attempts.

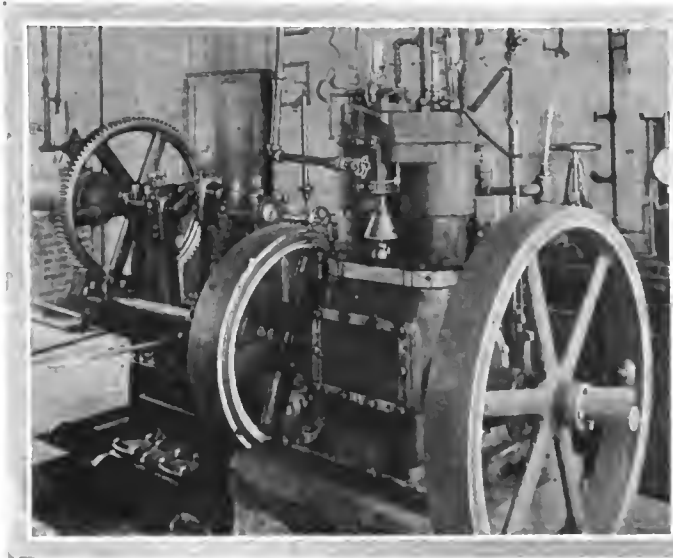
After all of these parts are investigated in detail, the assembled chassis as a whole is studied, the best materials to be used for frame, gears, shafts, etc., is determined, and then the student is ready for investigation in the construction of the leading makes of cars, both foreign and American. This study is greatly facilitated by the use of stereopticon views, which consist of several pictures of the make under consideration, showing the car as a whole, the chassis and any feature peculiar to that make.

Another course in the university which may well be taken in conjunction with the course above mentioned is a series of lectures in gas engine design, or "internal-combustion motors," as it is officially called. This is given by Professor Herman Diederichs, who is unusually well equipped to give a course on this subject, having made a study of the gas engine from both a theoretical and practical point of view. Professor Diederichs is a collaborator with Professor Carpenter in an exhaustive treatise on the internal combustion motor, now in the press. As its name indicates, this course of lectures, of which there are two a week during one term, devotes itself exclusively to the study of the gas engine, and includes the stationary and marine, as well as the automobile types.

While this is not entirely a theoretical course, formulæ for the design of all parts of a motor are not only learned, but derived as well, and standard measurements and proportions as adopted by the leading makers are discussed and investigated. It is in this course that the student can realize what the automobile has done toward the development of the internal combustion motor, how the weights of the materials used have been reduced, the qualities of the metals improved, the entire machine simplified by the elimination of unnecessary parts, and the increase in accessibility.

Not the least valuable part of this course is the study which is made of the theory of combustion, and the chemical changes which take place in the cylinder of a gas motor. This naturally leads to an investigation of the efficiency of the various fuels, and tables and data are given showing the performance of motors using every kind, from ether to alcohol, and from crude oil to kerosene. Particular attention has been paid to the use of alcohol as a fuel, especially since the free alcohol bill was passed.

Another interesting phase of these lectures is the theoretical investigation of the comparative efficiencies of the two and four-cycle engines for all kinds and sizes of work, from the small motor-cycle engine to the mammoth power-plant engines as used



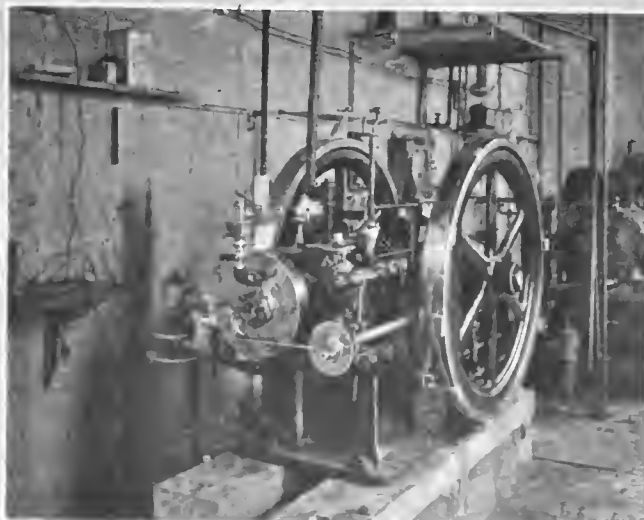
TWO-CYLINDER WESTINGHOUSE RIGGED FOR TESTING.

The pump shown at the left of the engine is used as a dynamometer, the amount of water pumped in a given time being found, and this reduced to the horsepower that the engine develops.

to a great extent in Germany. Taken all in all, this course, if entirely mastered, would give the student a keener insight into modern practical gas engine building than months of study of the best books and investigations at the different shops.

The foregoing courses, it will be noticed, consist mainly of lectures, where the student absorbs, as it were, the information gleaned by others without putting his knowledge to any practical use. In the course on "Gas Engine Design," however, which is given under the direction of the Machine Design department, opportunity is found for the application of all the knowledge available on the subject, for the student here designs a practical engine. The size and purpose of the motor are first determined, and then, applying the formulæ and methods of design learned in the lectures, the student makes working drawings of the complete gas engine, including every detail of dimensions, kind of material to be used, and finish. These drawings are required to be so complete that they could be sent to a foundry and a practical engine turned out from these specifications.

While, of course, modern practice and conventions are followed to a great extent, there is opportunity given the student to exercise his own ingenuity in original design, and possibly the solution of many of the problems which now confront the gas en-



OHIO GAS ENGINE RIGGED FOR TESTING.

Showing dynamometer on flywheel and apparatus for obtaining indicator cards

gine builder may be unexpectedly discovered in this drawing room. Now for the practical side of the course—for no investigation would be complete without the experimental proofs of the deductions and conclusions reached from the theoretical study. This is found in the Mechanical Laboratory, which is the most complete of its kind of any technical school in the country. The leading makes of two and four-cycle engines are here tested under different conditions of load, speed, fuel and the like, and the most efficient speed and load at which each model should be run is thereby determined. This testing of gas engines is included in the regular course of testing all kinds of machinery, and is required of all engineering students, be they mechanical, electrical or marine. These tests last throughout the Junior and Senior years, and each student is required to complete one a week. This course is extremely interesting, and is merely an application of the methods learned in the class rooms as a means for teaching original investigation and arriving at practical results.

It might be interesting to note that one of the first gas engines to be used in this country is on exhibition in this laboratory, and the contrast between this cumbersome machine and the light, four-cylinder automobile engine near which it is placed is striking. This parent of the modern automobile power plant consists of a single vertical cylinder, which is inverted—that is, the explosion forces the piston up instead of down. This piston is very heavy and has a connecting rod which consists of a rack or heavy rod, with gear teeth cut in it transversely. These teeth mesh on the down stroke with teeth cut in the shaft of a heavy flywheel. When the explosion takes place, the piston and rack are forced up, and when the exhaust has occurred the weight of the moving parts provides the force which revolves the flywheel by means of the rack meshing in with the gear only on the down stroke. It will be seen that the explosions are utilized only to move the weights up to a position where they can perform their work, and that not only must the speed of the engine be necessarily slow, but the power of the engine small, considering its weight and size.

Ithaca Has Many Autos and Much Enthusiasm.

One familiar with the locality would hardly consider the central part of New York State an ideal place for automobiling. And it isn't—steep hills are as frequent as good roads are scarce. By the central part of the State is not meant the vicinities of the larger cities such as Syracuse, Utica and Rome, but more what is known as the lake region. Here is to be found some of the most beautiful scenery in all of the Eastern States, and it is this combination of hill and valley, ravine and lake that makes the hills and roads what they are—and aren't.

Notwithstanding its location in the heart of this region, at the head of the Cayuga Lake, Ithaca can boast of as many automobiles and as many auto enthusiasts as any city of its size in the State, and possesses an automobile club which has done much to popularize both automobiling



PROF. ALBERT W. SMITH,
Director of Sibley College.



PROF. ROLLA C. CARPENTER,
Head of Department of Experimental Engineering, Sibley College.

and motor boating. But the heart and source of this interest lies "On the Hill"—in fact, the heart of Ithaca lies on the hill—for it is with the faculty and students of Cornell University that much of this interest centers. In fact, practical automobile construction and design are taught there. To be sure, no chauffeur's degree is conferred, but many of the recent graduates bearing the M.E. degree know more about gasoline motors and motor boats than they know about steam engines or calculus.

MR. WINKLEY'S IDEA.

Recently, before the Ad Men's Club of Boston, Robert L. Winkley, manager of publicity of the Pope Manufacturing Company, said in the course of an address:

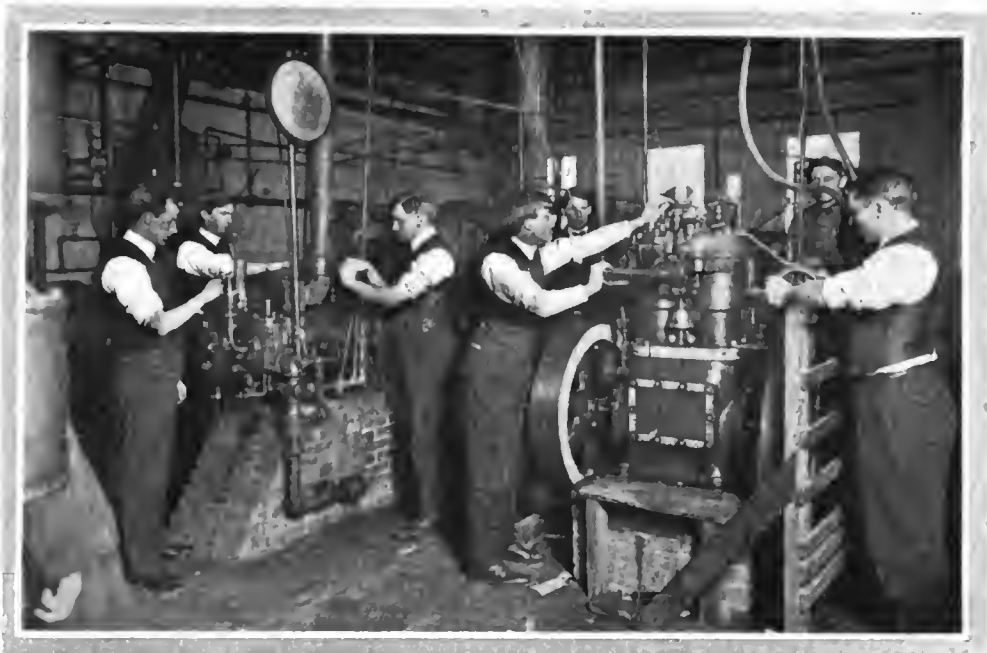
"There is no kind of publicity, whether it be direct or indirect advertising, so valuable as that which comes by word of mouth. The friendly comment and advice of a satisfied customer is far reaching and of great value. I believe that the trade papers do more to stimulate that word-of-mouth publicity than any other line of publications, because they go directly to the salesman, dealers and buyers throughout the country, and they act as a sort of medium of communication between these people, and what they have to say and do in the trade is an important element in shaping the conditions of the trade."

IMPORTERS' SHOW NOW REGARDED AS CERTAIN.

The announcement of the Association of Licensed Automobile Manufacturers that it will hold its show in November instead of January has roused the importers of foreign cars to action, and they are united in their declaration that an exhibition of imported cars at a later date will be a necessity. The sentiment as generally expressed in New York City is in favor of a show for foreign cars of all makes, whether sold here under the Selden patent license or not, though several importers express their strict loyalty to the A. L. A. M. and state that licensed and unlicensed imports should be kept separate.

One of the leading importers of licensed cars made the following statement: "It will be a physical impossibility to have 1908 models of foreign cars here by November, or even by December. There are eight importers of twelve makes of cars in the licensed group and they could make a fair show by themselves. But if all the importers got together a representation of from forty-five to fifty makes of foreign cars could be displayed. It is a question whether the A. L. A. M. would consent to the use of the Garden if unlicensed cars were to be shown there, but probable that that privilege will be sought."

At a meeting of the Importers' Automobile Salon to-night this matter will be discussed.



AT WORK IN THE MECHANICAL LABORATORY, SIBLEY COLLEGE, CORNELL UNIVERSITY.

Testing a Westinghouse gas engine on the right, and experimenting with one of the early forms of gas engines at the left. Students engaged in their daily practical work.

GAS ENGINES FOR BRITISH WARSHIPS.

LONDON, March 18.—The shipbuilding and gunmaking firm of Vickers Sons & Maxim, after three years' continuous research, has perfected a system of propelling war ships by means of internal combustion engines. A vessel of this type has been designed, which, having no boilers and no smoke stacks, will have enormous advantages over existing battleships. Her dimensions are moderate, but she is speedier than existing ships. Her battery is more powerful than that of the Dreadnought class, since, owing to the absence of smoke stacks, all ten guns can be fired on either beam and six of them ahead or astern.

A paper recently read before the Institution of Naval Architects predicted that warships in the future would be propelled by gas engines instead of steam. British naval authorities are now considering the adoption of motor boats on warships.



LOZIER MARINE ENGINE RIGGED FOR TESTING, IN SIBLEY COLLEGE LABORATORY.

EARLIER DATES FOR GARDEN AND COLISEUM

THE 1908 product of the American automobile manufacturers will be on view, both in New York and in Chicago, before the close of the present year. The Madison Square Garden show of the Association of Licensed Automobile Manufacturers will be held from October 31 to November 7, and the exhibition of the National Association of Automobile Manufacturers will take place in Chicago from November 30 to December 7.

It would appear that the latter date would conflict with the show of the Automobile Club of America, supported for the past two years by the American Motor Car Manufacturers' Association, and for which dates have been reserved in the Grand Central Palace from November 30 to December 7. It is probable and possible that the A. C. A. may advance its dates in view of the move of the A. L. A. M., and it is understood that the A. M. C. M. A. has prepared itself for any revision of the show situation. Alfred Reeves, its general manager, is expected back from a Western trip to-day, and a conference of the A. C. A. Show Committee is expected to follow. There has been some talk that the anti-Seldenites might promote an outdoor exhibition in November, but apparently this has never progressed beyond the mere suggestion.

How the A. L. A. M. Show Announcement Reads.

From E. H. Cutler, chairman of the Executive Committee of the A. L. A. M., on Monday came the following announcement:

"At the last meeting of the Board of Managers of the Association it was unanimously agreed to have an early show if suitable dates could be arranged. The Licensed Association has an option on Madison Square Garden for automobile shows for two years, and it was only a question of an arrangement of dates to proceed for an early show. Negotiations were completed on Saturday, and arrangements made for October 31 to November 7.

"The success of the last show in the Garden, where the attendance was so great that it was necessary to increase the admission for two days to \$1, has suggested the possibility of a ten-day show. The advisability of this is still under consideration by the Association.

"The show situation has so materially changed in recent years that an early show seems advisable. The demand for early deliveries of standard cars has been in part responsible for the Association of Licensed Automobile Manufacturers' change to early show dates. For years the tendency of automobile shows has been to particularly interest the dealers, but now that the industry has settled on a firm and conservative basis, contracts for the year's output of the various factories are usually made long before the end of the year; in fact, most of the cars for the fol-

lowing year are tried out long before November and December. The standard time which various manufacturers would naturally consider the best time for the showing of the following year's models would be based on a standpoint of knowing early enough what the people desired in the way of special specifications. Early shows would give ample time for purchasers to get in specifications, so that the factories would not be taxed to the limit of their capacity in getting out cars for delivery the early part of the spring."

Explaining the Whyfore of Earlier Chicago Dates.

From S. A. Miles, general manager of the N. A. A. M. and also manager of the Chicago show, comes the following pronouncement:

"The Eighth Annual National Automobile show at Chicago will be held at the Coliseum and First Regiment Armory, November 30 to December 7, as usual under the auspices of the National Association of Automobile Manufacturers, Inc. As was the case in February, the Chicago show will be the only truly national event of the year, for it will be the only one which will bring together all makes of cars, regardless of the affiliations of their makers with any other association.

"The early date has been selected only after careful consideration. There are a great many people in the trade who still believe that February, or even a later date, is the proper time for the show, but the expression of a desire for an early date has been so general that it has been deemed fair to early show advocates to give it a trial. The New York shows are to be held late in October or early in November, so that there will be the usual interval between New York and Chicago. The request made by the Chicago Automobile Dealers' Association was also an important factor in determining the date.

"It is probable that the allotment of space will be made about the first of September, though an earlier date may be selected."

May Embarrass the Foreign Makers.

Earlier dates for the New York and Chicago shows may seriously embarrass the foreign makers, for it will compel them to turn out a double set of models in order to exhibit their up-to-date machines in this country. The Paris Salon has already contracted for November dates and will continue for twenty days and lap into December. London's show is even earlier. Exactly how the foreign makers will meet the situation is somewhat problematical, but it is a certainty that they will contrive in some manner to figure in the American shows, for the market in this country is too valuable to be sacrificed without a big effort.

EUROPEAN MAKERS ARE UNITED ON SHOW DATES

REGULARLY every year, with the single exception of 1898, when the show was held in the month of June, Paris has held its automobile salon early in December. Once, in the early days, the unanimity of the constructors was destroyed and two rival shows were opened. For ten years, however, all has worked harmoniously, the Automobile Club of France organizing an annual show with the double object of exposing the latest models of automobiles and of impressing the public with the value of the new means of locomotion. It is this latter policy which has done so much to make the show the important demonstration it is to-day. It has been lifted above the level of a trade organization and made a public demonstration that no up-to-date person dare admit he has not seen. Other countries have either not grasped the value

of this line of procedure or have been unable to carry it out on account of local circumstances.

From December 8 or 9 to December 23 or 24 has been mutually and unanimously agreed upon as the most suitable date for the holding of the Paris show, and not even the proposition of a change would have been thought of had not the London show authorities, out of commercial rivalry, attempted to get ahead and transfer the world's market to the other side of the Channel. London, which up to 1895 had held its annual automobile exhibition after that of Paris, advanced its date to November with the avowed purpose of making French constructors show their new models in England before they were exhibited in Paris. The move succeeded to a certain extent, for unwilling to be behind on such an important market as is Great Britain, French

makers put forth a special effort and finished some of their following year's models in time to be exposed at the earlier show. Contrary to what had been expected, however, the French club did not respond to the British challenge by altering the date of its show; the announcement that this year's Paris salon will open in November instead of December is due entirely to the fact that it is the decennial show and will be celebrated with increased éclat.

French constructors are almost unanimously of opinion that it is impossible to produce the following year's models conveniently before the end of November or beginning of December. All European factories, for instance, are now working on their 1907 output and will continue to be busily employed thereon until early August. The selling season then being practically over, attention can be paid to the designing and construction of new types for 1908. Four months in which to design, construct, try out and give a show finish to two or three new models is not too long a period for even the best equipped factories. This is proved by the fact that the French makers are never ready for the show until a few days before the doors are thrown open. If the annual exhibition were held later there would not be sufficient time for agents to make sales and for the factory to fulfil orders early enough in the touring season to satisfy the public. From the standpoint of the salesman London's move in holding the show in the middle of November was commendable; but the same qualification cannot be applied when the constructors' interests are considered. In the last analysis it is best for all concerned that new models should be thought out when the factory is least occupied with pressing work. That period is at the end of the summer, and as a consequence the time of year for bringing out the new finished production is as late as possible in the year as is compatible with deliveries in time for the following season. There is nothing to be gained by holding an automobile show earlier than the beginning of December and French manufacturers are fully aware of it.

REPORT OF THE YEAR'S WORK AT HARTFORD.

During the past twelve months the Hartford laboratory of the mechanical branch of the Licensed Association of Automobile Manufacturers has been busily engaged in experimenting along various lines, and has just issued a report of the results of its work to the members of the association. Materials have chiefly occupied attention, and during the year scores of samples of special steels of various grades have been tested in various ways to ascertain the best method of bringing about the toughest possible condition of the metal. Among the alloy steels experimented with were nickel, chromium, chrome-nickel, silico-manganese and vanadium, particular attention being given to the latter. Some of the members of the association have been using vanadium steels in their cars, but the experiments having proven the great desirability of its extended use in the making of certain parts, the association has recommended its universal adoption by the members, as it is considered to be more serviceable than any other metal known. Specifications for the treatment of metals, screw material, cast iron, steel and nickel castings, with directions for obtaining the best results, have been issued in connection with the report. Not long ago the entire mechanical branch spent the day at the Bethlehem Steel Works inspecting the methods employed.

Among other things recommended in the report as the result of investigation during the past year are the adoption of a standard form of magneto base and a standard drill size, as there was found to be considerable variance in the use of taps and drills. A new feature about to be established will be the Technical Library of the Mechanical Branch, which will be installed at the association rooms under the supervision of the secretary, Coker F. Clarkson. As the first and only library of its kind, every effort will be used to make it as complete as possible, experiments, tests and formulæ emanating from the association laboratory at Hartford and from those of the makers being carefully tabulated.

PREPARING FOR THE MONTREAL SHOW.

MONTREAL, March 25.—R. M. Jaffray, director of the Montreal Automobile and Sportsman's Show, which will open at the Arena April 6, is a mighty busy man these days preparing for what promises to be the most notable automobile event ever held in Canada. While at the Boston show Mr. Jaffray obtained some new ideas, which will be utilized in the conduct of the local exhibition. The new annex is nearing completion, and the Arena will be tastefully decorated for the occasion.

One of the most interesting features of the automobile business in Montreal is the double expenditure necessitated by advertising in newspapers of two languages, English and French, caused by the large French speaking population.

SOME PITTSBURG SHOW PRELIMINARIES.

PITTSBURG, PA., March 25.—The Automobile Dealers' Association has invited the Mayors of Pittsburg and Allegheny to open formally the first automobile show in this city, beginning April 8. Governor Stuart and Lieutenant-Governor Murphy have also been invited to attend. The clubs of the Pennsylvania Motor Federation have been asked to send representatives and a meeting of this body will take place during the show.



DUQUESNE GARDEN, WHERE PITTSBURG WILL HOLD ITS SHOW.

The Liberty Automobile Company has completed arrangements for a thousand-mile non-stop run by a Wayne car. The run will begin April 4 and it is expected that a thousand miles will have been covered by the time the show opens. The car will then enter the Duquesne Garden and its motor will continue to run until it stops of its own accord. Various features will be employed in calling attention to the performance, including a guessing contest as to the distance covered every six hours and the time the motor will continue to run in the Garden.

Despite the fact that the Motor and Accessory Manufacturers declined to grant a sanction for the show, there will be a substantial line of accessories, including several displays of tires. The Show Committee, consisting of Thomas I. Cochran, W. H. LaFountain, Earl Kiser, W. N. Murray and Robert J. Sample, are sparing no expense in the work of preparation, and the Garden will be decorated in white and green, and 10,000 electric lights will add to the splendor of the affair.

The following dealers will exhibit: American Automobile Co., Allegheny Automobile Co., Atlas Automobile Co., Auto Repair Co., Banker Bros. Co., Colonial Automobile Co., D. P. Collins, Central Automobile Co., East Liberty Automobile Co., Forest City Automobile Co., Fort Pitt Automobile Co., Hiland Automobile Co., Homewood Automobile Co., James Motor Co., Keystone Automobile Co., Liberty Automobile Co., E. Nevin, J. E. McNary Co., Pennsylvania Automobile Co., Pittsburg Motor Vehicle Co., Rainier Automobile Co., Standard Automobile Co., Union Automobile Co., Wilkesburg Automobile Co., Winton Motor Car Co., M. H. Page.

TENDENCIES OF FRENCH AUTO CONSTRUCTION

By W. F. BRADLEY.

AS an indication of the tendency of the best European constructors, the annual statistics compiled by M. Lucien Périssé on the Paris automobile show have more than a passing value. The last Paris show contained 150 constructors, 60 per cent. of which were French makers of complete chassis, 13 per cent. makers of motors and different parts and 27 per cent. foreign constructors. Of the 60 per cent. just mentioned, 54 per cent. consisted of internal explosion motors and only 6 per cent. steam, electric or mixed systems.

Leaving aside the exhibitors of assembled machines and a certain number who exposed complete cars having no distinctive features, 65 French constructors exposed 149 different types of automobiles driven by internal combustion motors. Comparing these 1907 models with those shown during the previous four years, the following table is obtained:

Four-stroke motors—	1902	1903	1904	1905	1906
One cylinder	12	15	6	8	6.5
Two cylinders	37	26	15	20	11
Four cylinders	48	55	76	71	75
Three or six cylinders	3	4	3	1	7.5
Automatic inlet valves	55	33	3	6	6
Mechanical inlet valves	45	67	97	94	94
Separate cylinders .....	..	..	35	33	33
Cylinders in pairs .....	..	..	65	63	59
Cylinders in one casting .....	..	..	..	4	8
Ignition by magneto, make-and-break	22	32	26	39	24
Ignition by magneto, with plugs	0	6	23	45	72
Ignition, various	4	1	2	5	0
Accumulators	74	71	49	11	4

The show always being held in December, these figures refer to the succeeding year's models; 1906 figures, for instance, deal with 1907 machines.

In spite of the increased importance of six-cylinder engines, the four-cylinder type still remains the most popular for touring machines. The percentage of single-cylinder engines still remains high owing to the fact that several makers of light cars have adopted the De Dion engine, which is counted as a different type on each maker's chassis.

Considering the nominal horsepower of the machines—that is, the horsepower indicated in the catalogues—it is still the 24-30 type which has the largest number of representants.

Classifying the motors by their bore, the following figures are obtained:

	Per Cent.
70, 75 and 80 millimeters	7.0
84, 85, 86, 87 and 90 mm	22.5
95 and 100 mm	22.5
105, 108 and 110 mm	13.2
112, 113 and 115 mm	7.0
120 mm	13.2
124 and 125 mm	4.0
130 mm	3.3
140 mm	3.3
145, 150 and 160 mm	4.0

No horizontal motors were shown. Comparing these figures with those of the London show, in which British and foreign machines were exposed, we find that in the British capital 72.5 per cent. were four-cylinder machines and 4.5 had single cylinders. The percentage of horizontal motors was 4.5, as compared with 11 per cent. in 1905. At the London show 55 per cent. of the machines had double ignition. At the Paris Salon all the builders with a very few exceptions were of the opinion that double ignition is now superfluous.

Considering the construction of the engine, we find that 39 per cent. of the motors had valves all on one side—that is, they had only one camshaft. Motors with valves on opposite sides and consequently two camshafts were 55 per cent. of the whole, while only 6 per cent. of the motors had their valves in the head. Compared with the figures for last year's show, it is seen that the proportion of machines with a single camshaft has sensibly increased. In two-thirds of the machines a governor was provided; in one-third it was not used.

Methods of cooling have little changed since last year. Air-cooled motors are practically non-existent. Thermo-siphon water circulation was employed on 14 per cent. of the engines and centrifugal pump on 67 per cent. The majority of the pumps were driven direct or through gears within the crankcase. One per cent. of the pumps had friction drive and 5 per cent. had springs. The honeycomb radiator is distinctly on the down grade, its proportion being 40 against 59 per cent. of winged and tubular radiators. One per cent. were various systems. The fan behind the radiator was most frequently found, 63 per cent.; 15 per cent. had the fan within the flywheel and the same percentage had the two systems.

Pressed steel frames continue their progressive march and have almost abolished the tubular frame. The latter is only used now for sub frames. The following figures show the tendency in frames and clutches:

	Per Cent.			
	1903	1904	1905	1906
Pressed steel frames	46	76	82	90
Armored wood	32	16	14	10
Tubular and various	22	8	4	..

	Per Cent.				
	1902	1903	1904	1905	1906
Leather faced cone clutch, right	74	80	60	51	54
Leather faced cone clutch, inverted	13	10	17	15	10
Metallic clutches .....	..	..	20	32	36
Various types	13	10	3	2	..

There were a few special types of change-speed gears, such as the Fouillaron, with belt and extensible pulley, and that presented by the Swiss firm Turicum, but they were such a small number that they need not be considered. Change-speed gears of the sliding type can be classified as follows: Single sliding gear, 46 per cent.; double sliding gear, 31 per cent.; triple sliding gear, 22 per cent. One per cent. consisted of various systems. Direct drive on the high gear and the use of ball bearings remain as before, namely 88 per cent.; 2.7 per cent. of the machines under review carried the gear box within the rear axle casing, among them being the Henriod and Gillet-Forest.

The cardan shaft shows a large numerical superiority over final drive through side chains. This is partly accounted for by the fact that at the Grand Palais nearly every constructor showed a chassis intended for cab work or town use. For this class of vehicle the cardan shaft offers distinct advantages over chains; several important firms, among them Mors, C. G. V. and Fiat, have indeed not hesitated to adopt this type while maintaining side chains for their more powerful touring cars. The percentage of machines with chain and cardan shown during the last six years is as follows:

	1901	1902	1903	1904	1905	1906
Side chains	50	62	53	49	48	37
Shaft drive	44	35	47	51	52	63

De Dion-Bouton machines have double shaft; a few firms, among them Aries and Chenard & Walcker, have special rear axles and a few Lyons firms have direct drive on third speed.

Internal brakes were in a large majority, for they represented 90 per cent. of the total, a figure distinctly in advance of last year. External brakes were only used in a few special cases or on cheap cars. There was a strong tendency towards the use of soft metals for rear wheel brakes. Where the brake consists of steel on steel the band was always of a softer steel than that used for the drum. The metals used for all types of brakes were as follows:

	1906					
	1903	1904	1905	Wheel Brakes	Trans-Brakes	Average
Cast iron on steel	0.26	0.36	0.51	0.43	0.45	0.465
Bronze on steel	0.17	0.17	0.32	0.25	0.23	0.265
Steel on steel	0.33	0.30	0.13	0.21	0.22	0.215
Various	0.24	0.07	0.04	0.06	0.05	0.055

HOW LEVAVASSEUR BUILT HIS LIGHT MOTOR

By CAPTAIN FERBER.

PARIS, March 20.—With the prospect of the problem of aerial navigation being solved in the near future, it is interesting to note how Levavasseur, the French engineer, constructed his first extra light motor, now being used by Santos-Dumont and other pioneer aeroplanists. Captain Ferber tells the story as follows in a recent number of *Omnia*:

My friend Archdeacon is to blame for whatever has been done, for he got it into his head that if I met Levavasseur some good might result to the cause of aviation. At that time no automobile constructor had paid any attention to flying machines, and I had wondered if I should have to build an engine for myself. In 1903 I had tried a 6-horsepower Buchet and in 1905 a 12-horsepower Peugeot. Power had been doubled without an increase of weight, but it was not enough. The motor boat *Antoinette* then held all records for her force, 80 horsepower, and was the lightest motor in existence. I said to Levavasseur:

"Why did you make such a light motor for a boat?"

"It is a light motor," replied Levavasseur, "but I did not intend it for a boat; I wanted to put it on an aeroplane."

"How did that happen? Nobody seemed to know anything about it."

"Nobody would buy an aeroplane, so I put the aeroplane motor in a boat which people would buy."

"How did you get it so light?"

"Simply by employing aluminum everywhere where the metal had no efforts to support. I made numerous experiments in physics and was able to reduce every piece to the minimum while still keeping a good margin of safety. My cylinders were ground inside and out to get the desired dimensions and were equipped with a brass water jacket. Finally, instead of eight cylinders, I used sixteen or even thirty-two."

"You reduce weight by increasing the number of cylinders?"

"Certainly; the lineal speed of a piston cannot exceed eight meters a second, you know that. The power of a motor only increases according to the square of its dimensions, while the weight increases according to the cube. It is better to have a number of small cylinders than one big one. I have no vibration and I have no need of a flywheel. Then, as I have always two cylinders under pressure, I can start by switching on the current. Won't that do for your aeroplane?"

"That will be fine," I replied. "When the wind is favorable I can cut out my motor, sail through the air, economize gasoline, and start up again without cranking."

"Why, nobody has done that yet on a steerable balloon," said Levavasseur.

"Mine isn't a steerable balloon; it's an aeroplane."

"Then with my motor you can go astern without any increase in weight, simply by shifting the camshaft."

"That is an old dodge," I replied.

"Not so old; I have got a German patent on it, and German patents are not easy to get."

"What about the carbureter?"

"I have abolished the carbureter. Experiments have shown that with a polycylindrical motor it is impossible to prevent one of the cylinders taking all the fuel. I feed the cylinder by means of special piping and a pump with whatever they need, gasoline, kerosene, hydrogen. Steerable balloons need not waste their gas; they can use it in the motor."

"Leave the balloons alone; tell me what you will do about ignition."

"I shall have a coil."

"Not a magneto?"

"No. First of all, it is too heavy; then with eight cylinders there is not enough time to fire all of them. I should have them all firing at the same time."

I was charmed with the prospect of obtaining the motor I wanted for my aeroplane and rushed off to my superior officer's bureau at Chalais and cried:

"Sir, I have found the motor I want."

"Eh?"

"Yes, sir; I must buy it at once."

"You are in a hurry; let us look at it first and see if it does give 24 horsepower for two kilograms."

"But, sir, I cannot bring it; it is not begun yet."

"Ferber, you are mad. Do you want me to buy it with my eyes shut? Suppose it is too heavy."

"But, sir, that does not matter. It is lighter than any of the others."

"My good fellow, you are completely mad. I shall not allow the Government to have anything to do with such an affair. You can go."

There was nothing to be got from the State, so I gave the order myself. I ought to have had the first engine; I am getting the last, after everybody else. It is my fault for ordering a special motor instead of taking the standard type. Santos-Dumont came along, tried a "24" immediately, found it insufficient, gave an order for a "50" and is now waiting for a "100."

I got my motor, built my aeroplane and had all ready last November. Then orders came to have the Government steerable balloon *Lebaudy* ready for sending to the Eastern frontier. The order was executed, my poor machine being left out of doors for a few nights. There was a heavy storm, the balloon could not start, of course, and my machine was destroyed. Of course, I feel mad against that steerable. But I don't care; they will soon get their last kick. I am going to start again—in another place.

Features of the Antoinette 16-cylinder 100-horsepower motor are, bore and stroke 4.1 inches, weight 220 pounds, length over all 50 inches, width 24 inches, height 19 inches, revolutions 1,400 per minute.

SKY DOINGS OF THE CLOUD BRIGADE.

Alan R. Hawley, of the Aero Club of America, and A. N. Chandler, president of the Aero Club of Philadelphia, had a successful balloon trip from Philadelphia to the neighborhood of Atlantic City Saturday last. The balloon, the *Initial*, was inflated at the Point Breeze gas works, and went away without a hitch. At one time the balloon rose to a height of 7,000 feet, due to suddenly passing into the full rays of the sun, after having thrown ballast overboard. After a little difficulty in hooking the anchor, the sky pilots were pulled up by a friendly tree. Mr. Hawley scrambled down the rope and secured the balloon.

Santos-Dumont has been unable to do much outside work in Paris owing to the boisterous March wind. A recent little preliminary canter over the Saint-Cyr drill ground, a quiet run to see that all was in order, and not an attempt to fly, resulted in one of the propellers being snapped off.

M. Alfred Le Blanc and Mr. Mix had a thousand-kilometer flight in the balloon *Limousine* last Sunday evening. Leaving Paris at 6 o'clock, they landed the next evening in the Isle of Rugen, Germany. The outward journey, including all expenses, cost \$50; the return trip by rail, however, called for an expenditure of \$100.

James Gordon Bennett has sent to the Aero Club of France a magnificent souvenir of the first international balloon race held from Paris last year. The gift consists of a silver plate made by Aucoc, the famous Parisian silversmith, representing the cup in the center of a decorative design. The Aero Club of America will receive a similar souvenir.

KEROSENE AUTO BOAT FOR PILOT WORK.

PARIS, March 19.—Launching ceremonies and motor boat trial trips are daily occurrences now on the reaches of the Seine, and will continue until the two special trains leave the Gare de Lyon with their load of motor boats for Monaco. This week the Société des Vedettes Automobiles invited a party of press men to Juvisy, a few miles out of the city, to witness the trial runs of



INITIAL TRIP OF FRENCH PILOT MOTOR BOAT.

their new automobile pilot boat. This company is making a specialty of the construction of sea-going automobile craft known as vedettes, for use as scout boats in the navy, and for various service around the coast, where speed and prompt service are required. *Pilot I.*, which took the water to-day, has been specially constructed for pilot communication with incoming and outgoing vessels. She is a stoutly built craft, capable of facing a heavy sea. Her length is 30 feet over all, the hull is built entirely of four-millimeter steel, and is completely decked over. The deck cabin is sufficiently high for a person to stand upright and is only 40 inches above the deck level.

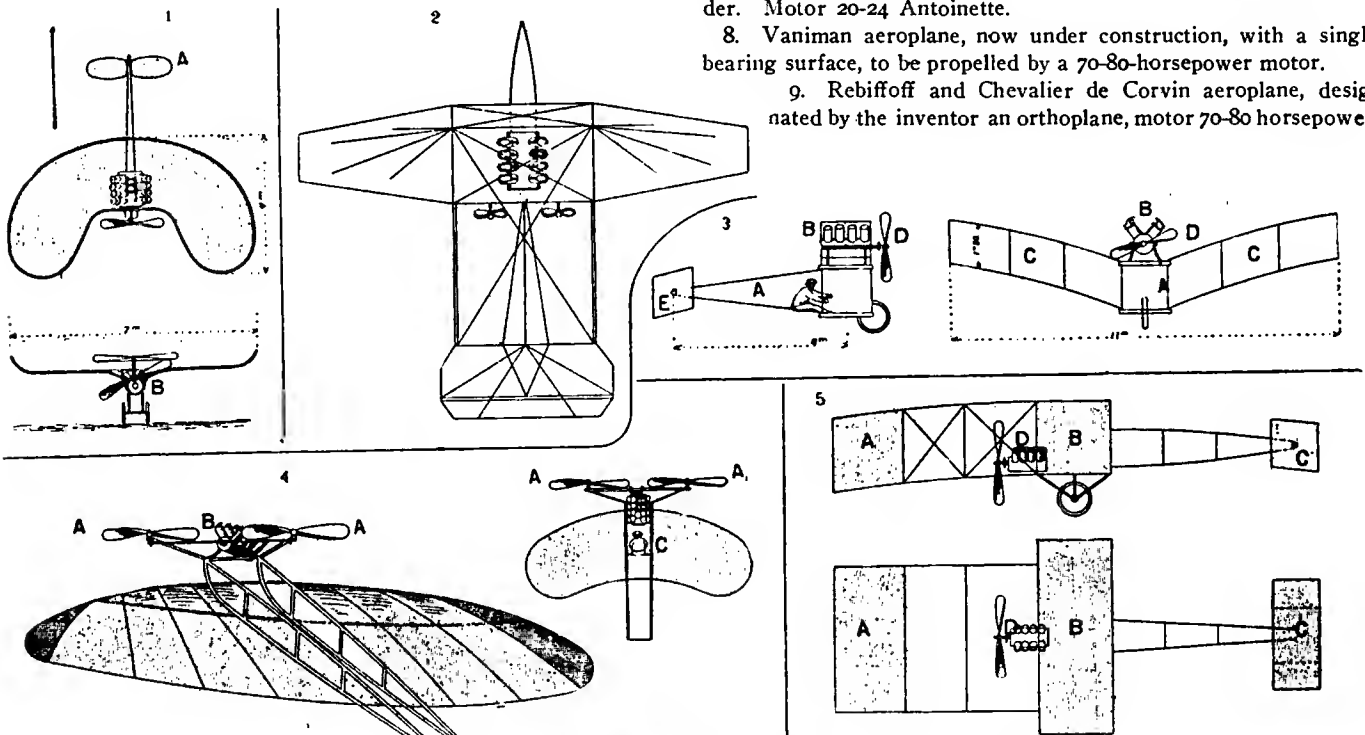
The motive power is a three-cylinder 25-horsepower Mietz & Weiss kerosene motor of the type which recently gained second

prize in a competition organized by the French naval authorities. Twelve minutes only are required to start the motor and obtain the maximum speed of 600 revolutions per minute. The boat averages eight miles an hour in open water, a speed quite sufficient for the work she will be called upon to perform. *Pilot I.* will take part in the Monaco meeting. In our illustration showing her at work on the Seine, Comte Recopé is standing forward against the pilot house and amidships is Henry Kapferer, the aeroplaneist.

NINE DISTINCT TYPES OF AEROPLANE.

PARIS, March 18.—According to *Omnia*, there are nine distinct types of aeroplanes actually in existence or under construction which can lay claim to serious attention. Without any attempt to place them in order of merit, they are:

1. Santo-Dumont's new aeroplane, consisting of six cells, with a bearing surface formed of thin mahogany in place of the varnished cotton used in the *14 Bis*. Width of wings is 24 inches, total bearing surface 13 square meters, and reduction of weight on the previous model 66 pounds. Motor, 50-horsepower Antoinette eight-cylinder, to be replaced by 100-horsepower sixteen-cylinder Antoinette weighing 220 pounds, under construction.
2. Bleriot aeroplane of the monoplane type, bearing surface 15 square meters, weight 550 pounds, motor 20-24-horsepower. M. Bleriot is now completing another aeroplane fitted with a 50-horsepower sixteen-cylinder engine.
3. Delagrange cellular aeroplane, bearing surface 60 square meters, weight 638 pounds, motor 50-horsepower Antoinette. Has only made one trial trip, which revealed fragile construction.
4. Vuia aeroplane, area 12 square meters, 12-horsepower carbonic acid motor, designed by Léon Serpollet.
5. Kapferer cellular aeroplane, bearing surface 60 square meters, weight 616 pounds, motor 20-horsepower Buchet.
6. Count de la Vaulx aeroplane, with a single bearing surface, built on the model of a flying bird, in the rear two propellers turning inversely, driven by a 50-horsepower motor.
7. Ignaz and Vels aeroplane, with a single curved bearing surface, having much resemblance to a maple leaf. There is no rudder. Motor 20-24 Antoinette.
8. Vaniman aeroplane, now under construction, with a single bearing surface, to be propelled by a 70-80-horsepower motor.
9. Rebiffoff and Chevalier de Corvin aeroplane, designated by the inventor an orthoplane, motor 70-80 horsepower.



OUTLINE SKETCHES OF A NUMBER OF NEW EUROPEAN AEROPLANES.

1. Bleriot Aeroplane: a, rudder; b, 24-horsepower motor. 2. Comte de la Vaulx Aeroplane: two propellers and 50-horsepower Antoinette motor. 3. Santos-Dumont Aeroplane, latest model: a, framework; b, Antoinette 50-horsepower motor; c, wings; d, propeller mounted direct on motor shaft. 4. Ignaz Etrich & Wels Aeroplane shown in perspective and from above: a, a, propellers; b, 24-horsepower Antoinette motor. 5. Delagrange Aeroplane: a, b, cellular bearing surfaces; c, rudder; d, 50-horsepower Antoinette motor.

LIMITS OF TOLERANCE IN AUTOMOBILE PARTS

By THOS. J. FAY, E.E.

AUTOMOBILE construction, to a far greater extent than machining work in general, requires that the duplication of parts be in fact rather than in theory, the true situation in relation to this matter being, more or less, one handled rather glibly by the able advertising manager, or, to more elegantly put it, "The Publication Department," in many establishments noted for the quality of their products. Unqualified, the above statements sound harsh, and would be pronounced of exaggerated breadth by mostly every maker of cars, for of all none would admit for one moment that parts are always in duplicate.

On the other hand, what is called the duplication of parts is another matter; what most makers really mean is that the cars are crystallized and the parts are produced by means of jigs, templates and gages, in so far as the exigencies of the situation would demand or warrant. In other words, if a part can be produced by means of a jig, a fixed tool or a process, at less cost than the same part could be produced by the ordinary process, as in a jobbing shop for illustration, of course resort is had to the cheapening process, and fortunately uniformity to a greater or less extent follows the process.

To attack the matter in hand from still another point of view would be to say certain parts can be produced to any desired degree of accuracy on a lathe in conjunction with a grinder, but the process would be slow in comparison, if, perchance, the parts in question could be produced on an automatic screw machine or on a semi-automatic turret lathe, or by any other multiple tool process, more or less automatic, by means of which quantity naturally takes precedence, or less quantity by the more laborious but not less accurate engine lathe.

Absolute Accuracy Impractical.

As a matter of fact, quick work on automatic tools is not, nor can it be, absolutely accurate; moreover, there is no good reason why absolute accuracy should be attempted, but the sum of the inaccuracies, even if arranged in algebraic order, do not of necessity equal zero, while the small inaccuracies as between connecting parts may be of such moment as to abort fitting, by a man of ordinary skill, without resort to tools such as lathes, mills or whatever would serve to wipe out differences in fitting parts.

The duplication of parts, then, is rarely the duplication promised by the "Publication Department," for, according to the flowing language of the persuading staff, a part, if replaced by a new part, will be replaced without any trouble at all; in fact, the new part will fall right into place and serve perfectly. This is obviously a wrong view to take, nor can this view be foisted on an autoist after he has used up his first car, for ere one car is ready to sell for "as good as new" the owner will have secured good and wholesome views of just what a duplicate part really does mean. Why should parts go together without any "fitting" at all? Drawings are usually turned out showing that a 2-inch shaft, for illustration, is to go into a 2-inch hole. Some say it is possible, more claim it is not; but the writer claims that the owner of a car will be much engaged if any attempt is made to solve the problem. In shops in general, fitting allowances are left to the foreman or the workman, but in a large shop there are a good many workmen and several foremen, hence it follows that all allowances are not from the same point of view or on the same basis, because all men do not think alike, nor is there any rational ground for expecting any such a phenomenon.

In an automobile there are a goodly number of situations and several conditions to satisfy, hence allowances for fitting must take into account the respective conditions for the respective places, else fitting will be a dire undertaking, with every chance of a loose fit where a tight fit would be proper or a drive fit in place of a loose fit, and so on. Just how any set of workmen,

however qualified to do good work, can satisfy so great a variety of conditions without a preconceived plan, is past all conception. To have parts come so accurate as to require no fitting work at all is extremely difficult, and demands that a system of allowances be devised and used. A system of allowances, or, as the matter is generally referred to, "limits of tolerance," are not new, nor do all shops disregard the matter, but the point is made that even shops that do take into account a prearranged system or set of limits to go by fall short in that the system is rarely worked out complete, or if it is worked out it is not followed out, mainly because draftsmen leave it to foremen and foremen pass it up to workmen, while the latter, accustomed as they are to doing things, make the best of the situation and the allowances as in their judgment *would seem to serve the end*. In many cases they are quite right, but it is too much to expect to be able to

DIAMETER OF SHAFT				
DIAMETER OF PART	GREATER PRESS FIT	GREATER DRIVE FIT	LESS HAND FIT	LESS NOMINAL FIT
1"	.001" To .002"	.0005" To .0015"	.001" To .002"	0 To .002"
2"	.002" To .003"	.001" To .003"	.0015" To .0035"	0 To .003"
3"	.003" To .004"	.0015" To .0035"	.00175" To .00375"	0 To .003"
4"	.004" To .005"	.002" To .004"	.002" To .004"	0 To .003"
5"	.005" To .006"	.0025" To .0045"	.0025" To .0045"	0 To .003"
6"	.006" To .007"	.003" To .004"	.00275" To .00475"	0 To .003"
7"	.007" To .008"	.0035" To .0045"	.003" To .004"	0 To .004"
8"	.008" To .009"	.004" To .005"	.00325" To .00425"	0 To .004"
9"	.009" To .010"	.0045" To .0055"	.0035" To .0045"	0 To .004"
10"	.010" To .011"	.005" To .006"	.00375" To .00475"	0 To .005"
11"	.011" To .012"	.0055" To .0065"	.004" To .005"	0 To .005"
12"	.012" To .013"	.006" To .007"	.00425" To .00525"	0 To .005"

TABLE I (ENGLISH).—Serviceable for fits of members with a fixed relation, but not for journals, considering parallel work. In these cases the bore of the holes should be within .0005 inch below the drawing size given, and the shaft or other part should change the amounts of these allowances above or below the diameter for the hole, as the case may be, considering the purpose.

buy all the cardinal virtues for \$15 per week, and the risk of failure is ever present in this class of mechanical work.

System Necessary to Meet Requirements.

The only way by means of which duplicate parts can be produced with sufficient accuracy to enable one to fit a new part—that is, a replacement—is if the limits of tolerance are worked out for every situation and the system is followed up completely and under the direct supervision of some one man skilled in the process of making allowances. That is, in a shop big enough to talk about. A system of this sort is based on inaccuracy; in other words, the system allows for errors and allows as much error for each case as the situation will permit, but the system fixes not only the magnitude but the direction of errors, and by so doing enables machinists to come within a fitting range, because *the errors are not added one to the other*.

A system, for illustration, takes into account the oil film that must be allowed for in places using oil, and disregards the pressure of oil, if oil is not to be present. Such a system allows for varying diameters of parts to be fitted and the ease with which accuracy can be realized in some places as against the

DIAMETER OF SHAFT

DIA. OF SHAFT	GREATER PRESS FIT	GREATER DRIVE FIT	LESS HAND FIT	LESS NOMINAL FIT
25	.025 To .05	.015 To .025	.025 To .05	0 To .05
50	.05 To .075	.025 To .05	.0375 To .05	0 To .05
75	.075 To .1	.0375 To .0625	.0425 To .0575	0 To .05
100	.1 To .125	.05 To .075	.05 To .075	0 To .075
125	.125 To .15	.0625 To .0875	.0575 To .0875	0 To .075
150	.15 To .175	.075 To .1	.0675 To .0925	0 To .075
175	.175 To .2	.0875 To .1125	.075 To .1	0 To .1
200	.2 To .225	.1 To .125	.0875 To .106	0 To .1
225	.225 To .25	.1125 To .1375	.0975 To .112	0 To .1
250	.25 To .275	.125 To .15	.0975 To .118	0 To .125
275	.275 To .3	.1375 To .1625	.1 To .125	0 To .125
300	.3 To .325	.15 To .175	.106 To .131	0 To .125

TABLE II (METRIC).—Serviceable for fits of members with a fixed relation, but not for journals, considering parallel work. In these cases the bore of the holes should be within .0125 inch below the drawing size given, and the shaft or other part should change the amounts of these allowances above or below the diameter for the hole, as the case may be, considering the purpose.

difficulty involved in attaining accuracy in other places. Taper fits are resorted to when possible on the ground that a taper fit can always be counted on for a good fit, but unfortunately taper fits cannot be taken advantage of in many places. Indeed, the idea with an allowance system is to provide a suitable allowance for every character of a fit, in every location, so that nothing will be left to chance or the individual judgment of abstract man.

It is all right enough to take advantage of the knowledge possessed by men of skill and experience, but that knowledge should be reduced to a concrete form and its use should be confined to a legitimate zone on the ground that changing the conditions must result in changes all along the line. Some years ago the writer, as "executive engineer" of the C. W. Hunt Company, used a set of allowances or tubular limits of tolerance devised by Mr. Hunt

DIAMETER OF SHAFT	BORE OF HOLE GREATER THAN DIAMETER OF SHAFT			
	CLOSE FIT	FREE FIT	LOOSE FIT	NOMINAL FIT
1"	.003 To .005	.002 To .011	.022 To .022	0 To .002
2"	.004 To .006	.009 To .012	.026 To .031	0 To .00225
3"	.005 To .007	.010 To .013	.029 To .034	0 To .0025
4"	.006 To .008	.011 To .014	.032 To .037	0 To .00275
5"	.007 To .009	.012 To .015	.036 To .040	0 To .003
6"	.008 To .010	.013 To .016	.039 To .043	0 To .0035
7"	.009 To .011	.014 To .017	.041 To .046	0 To .004
8"	.010 To .012	.015 To .018	.044 To .049	0 To .0045
9"	.011 To .013	.016 To .019	.047 To .052	0 To .005
10"	.012 To .014	.017 To .020	.050 To .055	0 To .0055
11"	.013 To .015	.018 To .021	.053 To .058	0 To .006
12"	.014 To .016	.019 To .022	.056 To .061	0 To .0065

TABLE III (ENGLISH).—Serviceable for bearings and similar work. In all cases while figures given are for bore of hole greater than diameter of shaft, the bores should be within .0005 inch of standard dimension given, and the shaft or part to fit the hole should have the allowance here given, below the standard dimension given on drawing.

and found the allowances quite in keeping with the requirements. Later on, when the automobile question demanded better attention, the writer revised the tubular values from time to time and broadened the system in all ways consistent with experience and new conditions. The values were also reduced to the metric system under stress of circumstances and additional tables were compiled, with a view of covering the whole subject.

Metric Measurements an Aid.

The question of the extent to which the metric system will, in future, be employed in America is one for the future to settle, but the writer has adopted the metric system and is using it in his regular practice to very good advantage, and it is believed an actual gain in time, as well as a reduction of possible errors, can be directly traced to the use of the metric system.

Before proceeding to employ the metric system, one of the most important matters was to fix up the tables of allowances in metric increments, because numerous workmen were not able to think in metric values, so to speak. This matter was not found to be as troublesome as might be supposed, because in automobile work a great number of the artisans are from abroad and came here as an adjunct to foreign automobiles.

BORE OF HOLE GREATER THAN DIAMETER OF SHAFT

DIA. OF SHAFT	CLOSE FIT	FREE FIT	LOOSE FIT	NOMINAL FIT
25	.075 To .125	.2 To .275	.275 To .7	0 To .050
50	.1 To .15	.225 To .3	.65 To .775	0 To .056
75	.125 To .175	.300 To .35	.725 To .85	0 To .063
100	.150 To .2	.375 To .350	.8 To .925	0 To .069
125	.175 To .225	.3 To .375	.875 To 1.00	0 To .075
150	.2 To .25	.325 To .4	.95 To 1.075	0 To .087
175	.225 To .275	.350 To .425	1.025 To 1.15	0 To .1
200	.250 To .3	.375 To .450	1.1 To 1.225	0 To .113
225	.275 To .325	.4 To .475	1.175 To 1.3	0 To .125
250	.3 To .35	.425 To .5	1.25 To 1.375	0 To .138
275	.325 To .375	.45 To .525	1.325 To 1.45	0 To .15
300	.35 To .4	.475 To .550	1.4 To 1.525	0 To .163

TABLE IV (METRIC).—Serviceable for bearings and other similar work. In all cases, while figures given are for bore of hole greater than diameter of shaft, the bore should be within .0125 inch of standard dimension given, and the shaft or part to fit the hole should have the allowance here given, below the standard dimensions given on drawing.

In any case it is well to have the limits of tolerance both in the English and metric measure, because the large number of foreign cars found in America are in metric measure, and in repairing them success depends, to some extent, at any rate, upon the use of the metric system. This point is not as broad as one might suppose, for, as can be reasoned, a repair is only made if a part wears, and just as likely as not the wear of the adjacent connecting part will be enough to make it possible to employ English units without detriment to the fit of the replacement to the connecting part.

As may be conjectured, the writer is not aiming to bolster up the metric or any other system, for in all truth the quality of a product is in the main independent of the units of measure, and one is perfectly free to use the one or the other of the systems; indeed, to be able to do so, the tables of allowances were broadened and extended, as before stated. The allowances differ in some ways from allowances as published by some concerns, and for the matter of that the writer knows of some published allowances that, if followed, spell failure, because they are neither right in theory nor adjusted to the needs of the situation.

Take a shrink fit, for illustration. If the allowance for fit is excessive, the inner member will collapse or the exterior member will split, or both members deform. This is an every-day occurrence and it is due to a lack of knowledge of the allowance that should be made for shrink fits. It is quite easy to strain the method beyond the elastic limit. In many places the fit can be anything but accurate and the result may not be impaired; moreover, a great many dimensions of parts are quite independent of any fit at all, hence to machine to dimensions closely would be a waste of time and money, to no avail. The system of allowances, then, is based on the assumption that no part can be machined to "neat" size and the principle of "error" is admitted. The real question, then, is one involving an allowable error, and the tables tell how much of an error will be permissible, but the error must be in a certain defined place, as, for illustration, in a "drive" fit the "bore" should be a "reamed" size, within, say, .005 of an inch below size. The shaft should be over size by some amount, depending upon the diameter of the shaft. Take, for illustration, a 4-inch shaft; for a drive fit

Table V gives the limits of tolerance for taper fits, taking into account tapers, viz., 3-16 of an inch, 3-8 of an inch, 3-4 of an inch and 1-2 inches to 1 foot. These tapers are enough to cover all possible cases in automobile work on a basis as follows:

DIAMETER OF HOLE TO BE LESS THAN SHAFT BY

DIAM. OF PART	PRESS FIT	DRIVE FIT	HAND FIT
25	.125 To .150	.0125 To .025	.0025 To .025
50	.150 To .175	.025 To .05	.
75	.175 To .2	.0375 To .075	.
100	.2 To .225	.05 To .075	.
125	.225 To .250	.0625 To .075	.
150	.250 To .275	.075 To .1	.
175	.275 To .3	.0875 To .1125	.
200	.3 To .325	.1 To .125	.
225	.325 To .350	.1125 To .1375	.
250	.350 To .375	.125 To .15	.
275	.375 To .4	.1375 To .1625	.
300	.4 To .425	.15 To .175	.

DIAMETER OF HOLE TO BE LESS THAN SHAFT BY	PRESS FIT	DRIVE FIT	HAND FIT
1"	.005 To .006	.005 To .0015	.0005 To .001
2"	.006 To .007	.001 To .002	.
3"	.007 To .008	.0015 To .0025	.
4"	.008 To .009	.002 To .003	.
5"	.009 To .010	.0025 To .0035	.
6"	.010 To .011	.003 To .004	.
7"	.011 To .012	.0035 To .0045	.
8"	.012 To .013	.004 To .005	.
9"	.013 To .014	.0045 To .0055	.
10"	.014 To .015	.005 To .006	.
11"	.015 To .016	.0055 To .0065	.
12"	.016 To .017	.006 To .007	.

TABLE VI (METRIC).—For 1 to 64 taper fits of parts. In every case make the male member within .0125 inch above the standard size given. For 0 to 32 taper, divide above values by 2. For 1 to 16 taper, divide above values by 4. For 1 to 8 taper, divide above values by 8.

Three-sixteenths of an inch to 1 foot, for parts not to be taken apart, unless when broken or worn out, as flywheels on crankshafts and like cases.

Three-eighths of an inch to 1 foot, for parts likely to have to be pulled apart, but to be securely held, as sprockets on jackshafts and like work.

Three-fourths of an inch to 1 foot, for parts to be taken or pulled apart at intervals.

One and one-half inches to 1 foot, special cases, but not much used.

Table VI represents the same class of work, using the metric instead of the English system. In this case that taper for

TABLE V (ENGLISH).—For 3-16 in. to 1 foot taper fits of parts. In every case make the male member within .0005 inch above the standard size given.

For 3/8 in. to 1 foot, divide above values by 2.
For 1/2 in. to 1 foot, divide above values by 4.
For 1 1/2 in. to 1 foot, divide above values by 8.

the shaft should be from .002 of an inch to .003 of an inch above size. This allows .001 of an inch to go on and a plus allowance great enough to guarantee a "drive" fit, even though the bore be slightly off, but as a guarantee against trouble from this source the bore should be slightly under, as provided.

Table I gives the limits of tolerance for press, drive, hand and nominal fits, using English measurements, and considering what has been said the table should be clear enough without further explanation. It will be understood that by "diameter" is meant the diameter of any given part nearest to the tabular diameters.

Table II gives the limits of tolerance under the same conditions as would obtain for Table I using the metric system instead of the English system of measurements.

Table III gives the limits of tolerance under still another set of conditions. In this case the "bore" is considered as within .0005 of an inch of the standard, making it possible to use standard reamers and the allowances are minus values on the shaft, taking into account close, free, loose and nominal fits.

Table IV gives the limits of tolerance under the same conditions as would obtain for Table III, using the metric system instead of the English system of measure.

APPROXIMATE DIMENSION OF PART	LIMITS OF TOLERANCE
	+ OR -
1"	.002"
2"	.002"
3"	.002"
4"	.003"
5"	.003"
6"	.003"
7"	.004"
8"	.004"
9"	.004"
10"	.005"
11"	.005"
12"	.005"

TABLE VII (ENGLISH). Allowances to go by in all cases if specific limits are not given on drawings.

APPROXIMATE DIMENSION OF PART	LIMITS OF TOLERANCE
	+ OR -
25	.05
50	.05
75	.05
100	.075
125	.075
150	.075
175	.1
200	.1
225	.1
250	.125
275	.125
300	.125

TABLE VIII (METRIC).

the equivalent of 3-16 of an inch to 1 foot is set down as 1 to 64, hence the other tapers would be 1 to 32, 1 to 16 and 1 to 8, respectively, for 3-8 of an inch, 3-4 of an inch and 1-2 inches to the foot, respectively.

Table VII takes into account the limits of tolerance of dimensions and parts not required to be definite, but in which an allowance can be made such as will enable machinists to easily and quickly come down to a size close enough for all practical purposes.

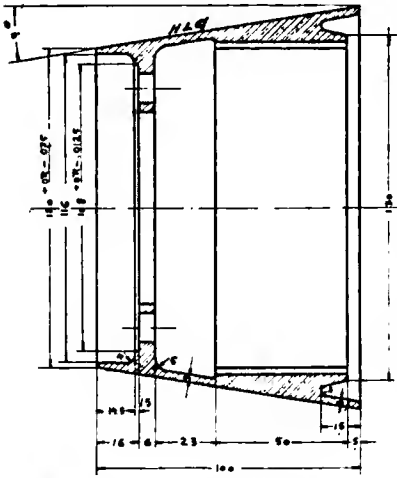


FIG. 1.—Method of noting on section.

Table VIII is the metric equivalent of Table VII.

These tables—VII or VIII, as the case may be—are to be used to go by in all cases in which specific limits of tolerance are not given on the drawings for each important dimensional value.

The method of noting limits of tolerance on drawings is one worthy of discussion. Draftsmen in making drawings put down "neat" dimensions, making no allowance at all, as, for illustration,

a 2-inch shaft is shown to go into a 2-inch hole. The person assigned to make allowances then takes the drawings and puts down the allowances as "plus," "minus," or "plus and minus" values in juxtaposition to the dimensional values to be influenced, as follows: (A) 2" +.002, if the dimension is to be .002 more than 2"; or (B) -.002 where the reverse; and where permissible to have fit come between either of these limits, (C) 2" +.002.

Advantages of Such a System.

The objects in thus fixing the allowances are threefold, viz.: (a) In order that draftsmen will not be required to waste time making allowances, thus enabling them to put down "neat" dimensions. (b) In order that one man skilled in the practice can go over the drawings and append the allowances. (c) In order that machinists will know at sight not only that allowances have to be made, but the magnitudes of allowances as well. Unless machinists can see that fits are provided for, they, by virtue of their training, are bound to give the matter further attention, and they will best be able to see at a glance if all allowances are put down in the manner as above set forth.

The drawings Figs. 1 and 2 show just how allowances are noted, remembering that the absence of allowances authorizes machinists to use the values in Table VII or VIII, English or metric, as the case may be.

In conclusion, there is one further point of magnitude sufficient to warrant discussion, viz., the taper as given, 3-16 of an inch to the foot, has an especial value in that an advance of one member into the other of 1-16 inch is at the expense of a difference in diameter of 0.001 inch nearly. It follows that a "taper play," if marked off by rings 1-16 inch apart, serves as a source of definite information to the machinist. Without this plug gage, measuring a taper hole becomes a matter of no small concern.

A WORD FOR BELT TRANSMISSION.

Automobile engineers have been largely recruited from the ranks of bicycle makers, and it is only in recent years that true engineers have given any attention to motor car work, says *The English Mechanic*. Hence, original errors have been to a large extent perpetuated, though by the use of improved material and better workmanship, such crude ideas as the sliding of gear wheels into mesh while revolving have to some extent turned out better than one would have expected. There is no reason why a belt should not be as successful in transmitting power on a motor car as it is in driving the machine tools used in the construction of the cars. There are plenty of belts made that will run equally well when wet as when dry, and we can always protect the belt from actual contact with mud and water, leaving only atmospheric conditions to contend with. Then as regards economy of first cost and upkeep, the belt is far ahead of gearing. Again, who could repair a broken gear when on the road, even if a spare wheel be at hand? In most designs it means half a day's work to get the old wheel out and another half-day to replace the parts and get the car into running order again. Anyone could put a new belt on, and a spare is easily carried. The whole reason for the apparent failure of belt-driving is due to the use of belts too narrow for the power, and too small pulleys placed too close together. Given a decent width of belt, pulleys as large as the space allows, and shafts as far apart as possible, and the result will be a car of simple design, cheap to make and maintain, easy to repair, and more silent than any gear-driven vehicle. I would go further than Mr. Smith by eliminating the gears he mentions, by having fast and loose pulleys only. Surely this device has been well enough tested and exploited in the many engineering and other works all over the world for us to have confidence in it. Mr. Smith's specification does not want much alteration; do away with the gears and use fast and loose pulleys, is my amendment. Differential gear we must have; but this is not likely to give trouble, or make noise, if well designed. It will be interesting to have the views of readers on the subject, and probably some valuable suggestions will result.

WHAT HAPPENS TO OVER-STRAINED METAL.

Will the time ever come when we shall know what has really happened to a piece of over-strained material? asks the *American Machinist*. It has been usual to suppose that its particles were already partially severed—pulled apart by tension so that they were in a sense past repair. But recent investigations appear to show that this is not the case, but that both for iron and for steel the over-strained state gradually disappears, and ultimately an over-strained piece gets near to its original condition. A piece of semi-mild steel strained at its yield point of 38 tons until it took a permanent set of 0.13 in. in 4 in., regained a lot in two days, progressed for two weeks and was entirely perfected by heating to 200 deg. C., though a few minutes at 100 deg. C. would have served nearly equally well. Other metals recover from over-strain with rest, and more quickly by the application of moderate heat, and both aluminum and copper have been tested. Aluminum bronze recovers very slowly with time, but rapidly with moderate heat treatment.

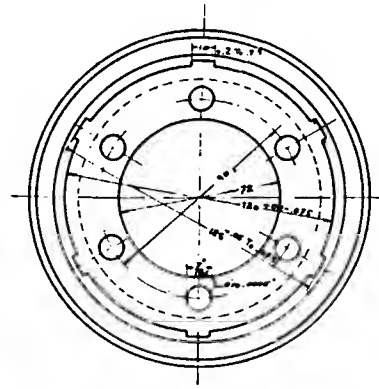


FIG. 2.—How allowances are noted on plan.

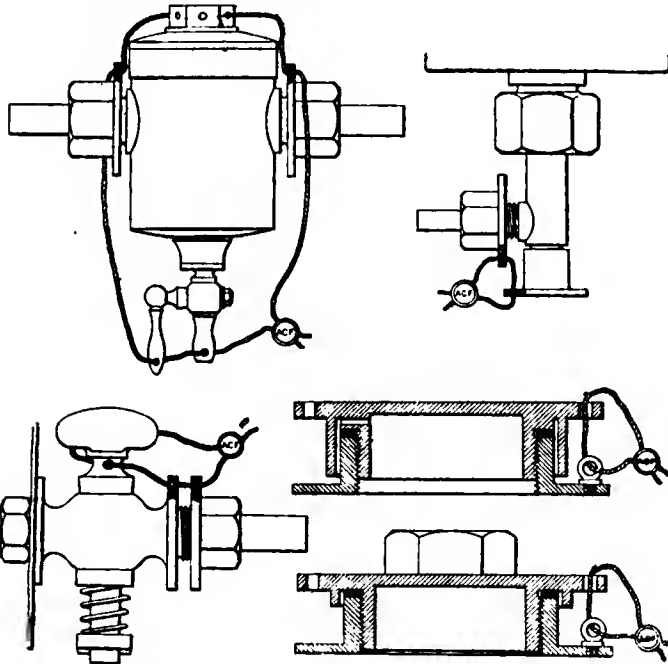
AUTOS FOR THE HEART OF DARKEST AFRICA.

The almost uncivilized tribes of Southern Nigeria are about to be introduced to the most recent development of modern civilization, says *The Egyptian News*. The first motor-car to be used in the Protectorate is now on its way, a smart touring vehicle built to the order of the High Commissioner, Sir Walter Egerton, for his own private use. Hitherto road surfaces in Nigeria have been so bad, generally speaking, as to render vehicular traffic of the motor type impracticable, but new roads are being made and railways are springing up in all directions. With facilities for petrol and "spares," no doubt the motor-car will meet in Southern Nigeria with a modicum of that success which has attended its introduction into other comparatively unknown countries.

WHAT AUTO INVENTORS ARE DOING ABROAD

AS fuel consumption is to play an important part in the speed contests to be held during the present season in France, the driver or builder who by some clever artifice is able to provide his car with an additional five or ten litres of the precious *essence* will have an incalculable advantage. To quote a late issue of *Omnia*, from which the present is an extract, "he will be able to give his motor a stomach that much bigger,

them, whether it be gasoline, alcohol, etc. As soon as a tank has been weighed, it will be replaced on the car, and will be supplied immediately after with the quantity of fuel necessary for the entire test. The accompanying line sketches illustrate the means provided to prevent any of the contestants using more fuel than the regulations provide him with. Fig. 1 shows the application of a lead seal to a gasoline filter in the supply line; Fig. 2, the seal as applied to the carbureter inlet; Fig. 3, manner of doing the same to a stop-cock, while Figs. 4 and 5 illustrate gravity and pressure supply openings to the tanks.



DEVICES ADOPTED TO PREVENT FRAUD IN THE GRAND PRIX.

FIG. 1.—Method of sealing filter. FIG. 2.—How stopcocks will be sealed. FIG. 3.—Seal on carbureter intake. FIGS. 4-5.—Seals on Tank Fillers.

and with correspondingly greater power." In consequence the Commission Sportive of the A. C. F. has called upon the Commission Technique to formulate plans for the prevention of any possible means of fraud in this direction, and the latter has submitted the devices shown in the accompanying illustrations as effective preventives of the introduction of any supplementary supply of fuel during the course of the race.

(1) All tanks will be provided with a single filling vent of the type already adopted by the Commission Technique and its use will be compulsory on all vehicles. It will be made with a free air vent for gravity fed cars and an air-tight cap for pressure fed systems.

(2) Also of a special design of tank outlet, as per the model already adopted. Each carbureter will be provided with a special type of feed union, and where a carbureter is equipped with a drain cock, it must be disposed in such a manner as to permit of the application of a lead seal. The supply pipe from the tank to the carbureter may be equipped with a filter, but such filter must also be arranged so that all its openings may be sealed. Gravity tanks must not have any other orifice than those above indicated, *i.e.*, filling and feed. Pressure tanks must have but one orifice for the introduction of gas so arranged as to be sealed. Tanks must be made so as to be readily dismantled and must be presented to the commissioners specially appointed to examine them on the eve of the test.

The weight of the tank will be taken both before and after the race, and the commission reserves the right to take apart any tank after the completion of the test. Cars whose tanks do not comply with the foregoing conditions will not be permitted to participate. Entrants may employ whichever fuel best suits

Dismountable Rims Still to the Fore.

Though there has not been much said of the dismountable rim during the past few months, it is evident that attention in this direction has not been lacking. In tackling this problem American inventors have one and all tried to discard the standard clincher type of tire entirely, and many of the devices evolved are not only ingenious, but very practical. Abroad, those who are devoting attention to the subject appear to be working very largely with the clincher tire as a basis. The Shrewsbury and Challiner rim, of which illustrations are shown here, is another instance of this that has recently come to light in England. It consists of a composite rim, says the *Autocar*, with a shallow wooden felloe, surmounted by a flanged steel rim. The flanges on the latter are very deep, so as to compensate for the shallowness of the wooden felloe, giving the wheel much the appearance of one that is solid. As shown, one of the flanges is detachable, so that upon its removal the tire may be drawn off bodily on its own rim. In Fig. 6 the rim is shown dismantled, giving an idea of its components, and also picturing the wooden blocks placed at intervals round the periphery of the felloe to serve as supports between the wheel proper and the rim of the tire which rests upon them. Passing through each of these blocks is a bolt corresponding to a hole in the detachable flange, and securing it in position by nuts when it is on. Both the tire and its rim are of the standard clincher type with the exception of the security bolts, the stems of which are made shorter, though the valve stem is left unaltered, this being made the starting point when placing a tire and the finishing point when removing. The sectional view clearly illustrates the disposition of the various parts when the tire is in place,

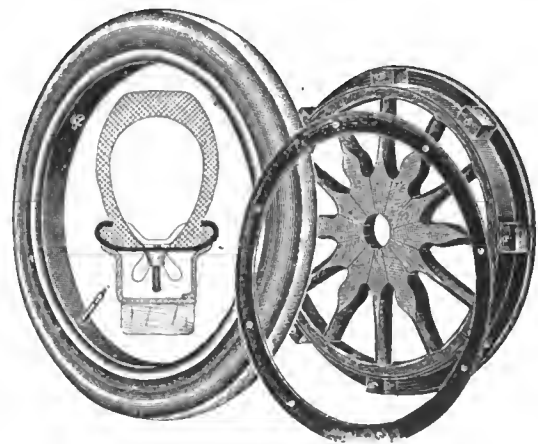


FIG. 6.—Details of the new English dismountable rim.

with the exception of the bolts, which pass transversely through the solid flange, wood block and detachable flange, as already mentioned.

Comparative Strength of Wire and Wood Wheels.

Though it has long been generally recognized that, weight for weight, the wire wheel is greatly the superior of its wooden rival where strength is concerned, just how much more it was

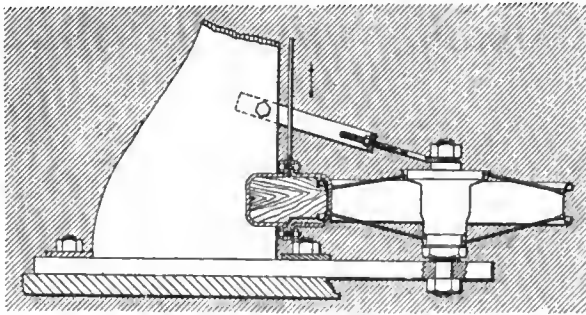


FIG. 7.—Position of wheel in testing machine.

capable of standing than the latter has never been set forth in the shape of comparative data, so that the results of a comprehensive series of tests made in England and brought to light by the *Autocar* are of considerable interest. The wheels are tested in a Denison 6,000 pound tensile testing machine specially equipped for this purpose. The wheel is fitted to a spindle, which is connected to the bed of the machine and rigidly supported at both ends, so that in measuring the deflections of the wheels due to the varying pulls the "give" of the spindle will be eliminated. A block of wood is fitted into the rim and round this a sort of stirrup, the whole apparatus being so proportioned that the pull comes on the wheel at the equivalent of the road line and not at the rim. It will also be noted that the pull is in the same direction as the axis of the wheel, as denoted by the arrow shown alongside the tension strap in the illustration showing the wheel on the machine under test. Fig. 7.

In Fig. 8 a diagram is shown on which curves of the comparative strengths of the two types of wheels have been plotted, the deflection in inches being measured on the horizontal and the pull in pounds on the vertical line. All the wheels tested were quite new, and, owing to the greater rate of deterioration to which wood is subject, it would be necessary to provide a higher factor of safety in the case of the latter to make it equally safe as the wirewheel throughout its existence. This is apparently not done, as none of the heaviest wooden wheels proved to be within five per cent. of the strength of the weakest wire wheels, despite the great difference in weight.

The curves plotted on the diagram in Fig. 9 are based on the same series of experiments as those in Fig. 8, but they have been corrected for weight by dividing the pull by the weight of the wheel. Consequently the vertical measurements to any point on the curve represent the number of times its own weight that is required to cause the wheel in question to deflect an amount represented by the horizontal distance to the same point. For example, the wire wheel deflects 1.48 inch

with a load of 185 times its own weight, and the wooden wheel D deflects 3.9 inch with only 63 times its own weight. This diagram further supplies the data necessary for the construction of a wheel that will be the strongest for a given weight. The wire wheels used were made by the Rudge-Whitworth Company, the well-known English makers of bicycles. Of course, there are insuperable objections to the use of the wire wheel on pleasure cars that are so patent as to hardly call for comment, but the data show its great value for racing purposes.

Preparations for Madrid's First Show.

Up to within the past year or two Spain's progress toward the adoption of the most modern style of locomotion was somewhat on a par with that of the frozen dominions of the Czar. The only Spanish highways are the *carreteros*, or cart roads, that have served from time immemorial as means of communication between the cities, and which are about in the same condition today as they were when Don Quixote rode over them in search of adventure. Few tourists venture over the French border in this direction and those who did found points of supply so few and far between, and the reception accorded them so hostile, that they were not anxious to repeat the experiment. But Spanish royalty has changed all that; it has put such a firm seal of approval on the automobile and everything pertaining to it that there is no alternative left to the population but to do likewise. Hence Spain is shortly to have its first automobile show, and, like all first attempts, it will include exhibits of bicycles and other miscellaneous features somewhat alien to the auto.

The exhibition will be opened on the 4th of May and continue

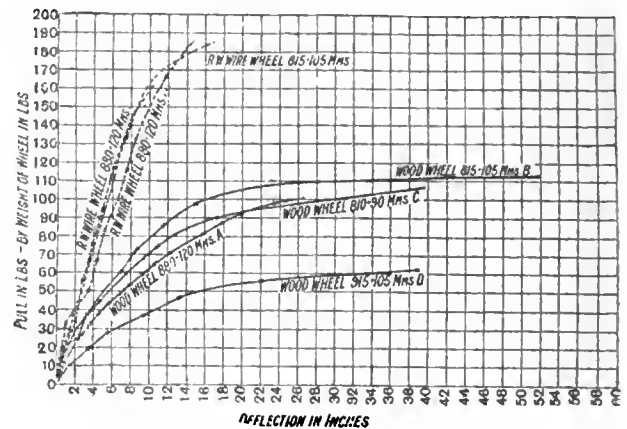


FIG. 9.—Corrected curves showing deflection in inches.

for fifteen days, or until May 19. As is natural under the circumstances, the great majority of the exhibits will be by French makers, though in the preliminary list already published there appear a few scattering representatives of the Teutonic and Italian industries. Every inducement is being held out, the Government having accorded the privilege of free entry for all exhibits that are to be returned within three months.

Prominent among the exhibits will be the product of Spain's first automobile factory, La Hispano-Suiza. Some of the well-known Continental makes that will be staged are the Panhard, Dietrich, Berliet, Benz, Delahaye, Brillie and Bianchi. Your true Spaniard moves leisurely, as may be surmised from the following information set forth in the official bulletin of the coming event, and which will be found to contrast somewhat sharply with similar things here, where forty-eight to sixty hours usually represent the maximum permitted the management to install the decorations and the exhibits. Compared with this, exhibitors at the Madrid show will have from April 16 to April 30 to decorate their stands and put the cars in place. On May 1 there will be a meeting of the commission to dispose of stands not occupied up to that date; all to be ready by May 2. Here, twenty-four hours are usually given in which to dismantle the show; exhibitors at Madrid will have to May 29, or eleven days.

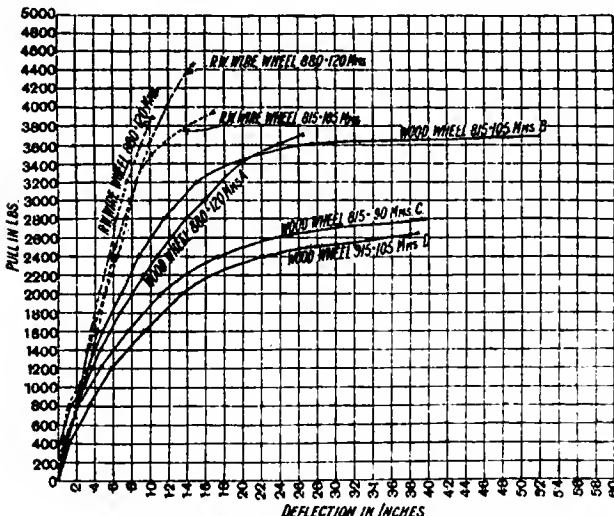


FIG. 8.—Comparative deflection of wire and wood wheels.

PAST AND FUTURE OF POWER TRACTION ON ROADS*

BY THE RIGHT HON. SIR. JOHN H. A. MACDONALD, K.C.M.G.

THE marked difference between the people of this country and the people descended from us in the United States is that, whenever an American is presented with a new idea relating to some practical purpose, his whole energy is concentrated on finding out whether he can make it do, and on endeavoring to improve upon it, to make it do still better. We, on the other hand, have a constitutional tendency to try to find out how it will not do, to treat it with suspicion as a new-fangled useless thing, and on the slightest hitch, probably caused by our own want of skill in handling it, to cast it aside as useless. I remember, when a boy, seeing in the first great exhibition, in 1851, two American reaping machines, the first London had ever seen, and which immediately set the fashion of mechanical reaping all over the country. The fact is that the practical part of the machines was not new. A reaper on exactly the same principle was invented by a Forfarshire clergyman so far back as 1822, and was then in use, and had been in successful use for twenty-nine years before Hussey and McCormick were ever heard of. But no one ever thought of following this Forfarshire farmer's example until the reaper came to us as a novel Yankee notion.

Keeping in view this tendency to negative new ideas—to spend energy in finding reasons why they should not succeed rather than to strive to make them successful—it is truly a thing most astonishing that the road power vehicle has made the extraordinary advance which we have seen in the last ten years. The fact that it has done so demonstrates its transcendent potentiality as a practical mode of locomotion. It is true that a fair trial was also refused to it seventy years ago, but this was not brought about by adverse scientific opinion. No scientist spoke against it, and many enthusiastically supported it. The reason why we have not had power vehicles on the road during the six last decades of the nineteenth century is not to be found either in scientific rejection nor in practical demonstration of failure. It stands recorded on the books of Parliament that power traction was at that time a practical success, and the same Blue-book tells of the efforts made to crush it out, which were only too successful. The parliamentary power of the railway interests, and of the peers and squires and farmers, was ruthlessly applied to destroy the new industry from pure selfishness in the former class and crass stupidity in the latter. The railway interest saw in it a dangerous rival, the land interest failed to see its certain benefits to country districts. Short-sighted greed killed power traction by iniquitous tolls and deliberate road outrages, and it was not heard of again until in the early sixties. Thomson drove by steam the first rubber-tired wagon and the first steam rubber-tired omnibus for a short time in the streets of Edinburgh, acting illegally, and, therefore, was very soon made to stop his experiments.

All this makes it the more astonishing that in ten short years since the Act of Parliament which gave permission to vehicles for ordinary purposes moved by mechanical power to use the road, such strides in advance should have been made.

I do not believe that when the little string of cars started for the first joint run to Brighton to celebrate Emancipation Day there was anyone in the procession into whose mind it entered for a moment that that tiny nucleus had in it the germ of the flourishing, well-rooted and fast-growing plant of to-day. Without disparaging that gallant effort of the few plucky pioneers to celebrate the Emancipation Act, there can be no doubt that the 1,000 miles trial of 1900 was the event which first gave a real impetus to motor traction in this country. The Brighton run was the flashing out of the enthusiasm of the few, the 1,000 miles tour was the kindling of the real fire never again to cease glowing—that fire of confident enthusiasm which is irre-

*Extract from paper read before the Automobile Club of Great Britain and Ireland.

sistible, which then began to flame up vigorously, and is steadily burning its way through the thickets of selfish and prejudiced opposition, which have done their utmost to smother it out. Can anyone doubt that our fate would have been a sad one when Parliament took up the matter in 1903, had the demonstration of 1900 not convinced all but the hopelessly prejudiced that motor traction on roads was a practical and useful advance in locomotion, which, whatever its drawbacks might appear to be, must be accepted as an accomplished fact, and that reasonable regulation, and not repression, was the only statesmanlike course in dealing with it. Many things, of course, happened on that memorable journey which would not happen now. The cars were not—could not be—the steady-going, trustworthy carriages which we enjoy the use of now. There was much that was of the experimental stage about them all, and experience was limited. It was plain to be seen that the problem of convenient road traction by mechanical means was definitely solved, and that whatever ups and downs might take place in the future, progress to efficiency and to triumph over prejudice were assured. Whether any of us realized that the triumph would come so soon and be so complete I doubt. But this I think I may say for all of us who made the nineteen days round, that we did not feel from the first as if we were making an experiment. We knew that we were demonstrating the existence of a real and practical system of locomotion, the success of which was an accomplished fact, and the predominance of which was an ultimate certainty.

But great as was the success of the 1,000 mile trial, it may well be doubted whether the cars which took part in it had among them as many vehicles as could be counted on the fingers of one hand which would compare, in any reasonable degree, with the touring car of to-day, and there was not among them all one single carriage with a cover. A few had hoods for one seat, but that was all. On the other hand, many of them had excellent engines, of lasting quality. The car in which I rode was still doing work a short time ago, and may be doing good work still.

In order to gain an appreciation of the extent of the recent rapid speed of automobilism in this country, I have made it my practice for the last two years when I happened to be in town to take careful note of the number of power vehicles as compared with those drawn by horse haulage, and the result of many observations is to make it plain that enormous strides have been taken and are still being made from day to day. I shall give you some figures presently, but I wish first to point out that not only is the rapid increase of numbers a cause for wonder, but that something more wonderful has happened. I mean the rapid increase of cars which are built to take the place of the barouche, the landau and the brougham which were our *voitures de luxe* until lately. Whereas in 1900 all the automobiles were open pleasure vehicles, a very large proportion now are high-class carriages, which will compare for style and elegance of fitting with the best Laurie and Marners or Morgans of past days. Indeed, one has only to take a walk along Oxford street, or Bond street, or Longacre, to see the coach-builders who cater for what are called carriage people, and who a few years ago would have scouted the idea of allowing an autocal to be seen upon their premises, vieing with one another in display of motor carriages of all descriptions, the cars being placed in front, and the horse carriage relegated to the rear.

But a still more remarkable feature of the development of motor traffic has recently made itself manifest. For a long time it was the common belief that the motor vehicle was the toy of the wealthy sportsman, that its appearance upon the road was only the result of a temporary craze, and that very soon it would lose its attractions as a sport, and would cease to

make progress, and ultimately be relegated to special sporting tracks or die out altogether. It is only necessary to observe what is going on to see how absurd any such ideas are. It is becoming more and more clear every day during the last two years that the autocar is no longer the amusement carriage of the leisured, but is becoming the conveyance of the business man.

As regards the future, the business of the hour is not, as I think, the assisting of the trade to show the excellence of their wares or to organize competitions to show what the power vehicle can do as a fast vehicle. It is the commercial vehicle that requires most attention. The business vehicle is now beginning to make its way. It is significant that such a firm as Pickford, who owned the first steam road wagon more than 100 years ago, are doing a tonnage of 480 tons, that another firm is replacing 300 vans by motor vans, that their use by the postoffice is already increasing, and the fire brigade and ambulance services are being rapidly converted. The success of the commercial motor will do much to make the public—ever slow to accept change, however beneficial—begin to take power traction as a matter of course, and when it does this it is only a step further to its being recognized as a benefit. This is already the case as regards the motor omnibus. When the snow was on the ground one read in the newspapers paragraphs such as this, taken from a leading paper: "It will be interesting to see how a motor omnibus will behave when a frost or thaw sets in. There will without doubt be an increased number of casualties with lamp posts in London thoroughfares, that are on an incline"; and a picture, intended to be funny, was given of vehicles crashing into standards, smashing into shop windows, and colliding with one another all over the place. The few days which followed this prophecy disclosed the fact that while the electric tramcar and the horsed omnibus had often to give up the struggle against snow and frost, the motor omnibus went gayly and successfully through its work. It will be the same in other departments of commercial transport. The motor vehicle, both for pleasure, for traveling and for commerce, may now be left very much to work out its own way. The real work that is before us is, I suggest, in other directions. The motor for personal and mercantile purposes needs no further nursing. It can take care of itself. The work of the future seems to me to be a work of overcoming the forces which tend still to induce the legislator to think that he is serving the public good and pleasing the crowd by crippling and obstructing progress. Now, what are these forces? There are three, two from external sources and one from within. There is first the bitter and rabid opposition of that large class in this country to whom every change which shakes them out of their groove is intolerable, or, if not intolerable, distasteful. There is, second, the real provocation caused to the non-motorist by the dust on the road being disturbed, to his discomfort. There is, third, the enemy who, to our shame, is of ourselves—the inconsiderate and sometimes even black-guard motorist, and he is the very worst enemy we have.

Fast mail coaches were to ruin the country and cause physical breakdown. Railroad traveling was to destroy our nerves and cram our asylums, and shorten the average life, which has been going up for the last seventy years. The railway train was to deprive our children of sustenance by making the cows withhold their milk. Cycling was producing a haggard, mentally diseased look on our faces. Now we motorists in our turn are told that motoring is attacking our spines, ruining our nerves, breaking down our health, and hurrying us to the madhouse. Yet here we are, like the jackdaw of Rheims, we are under the curse, but strange to relate we are nothing worse.

Well, we may laugh at these extravagances, but they have their serious aspect. They tell of a deep-seated enmity to our cause, the more virulent, because unreasoning. It must be met as if it was serious, and resolutely combated by vigorous argument and refutation, and for this all who have the cause at heart should arm themselves with facts and illustrations and

press them in society on every occasion when it is discreet to do so. We must show that we are rationally serious, and not to be put down by strong adjectives or blatant prophecies.

The second point as regards the future is the dust question, which is of all the most important and the most dominating, because it is one as to which complaint is justified. Even when driving is considerate, the evil of dust is still not trivial, and when the road cad is about it is not only objectionable but intolerable. I have seen a car approach and go past without slackening speed in the least, thick clouds flying out right across the road, like the smoke from a double broadside of quick-firing guns, compelling every other vehicle to come to a dead stop for minutes, it being impossible to see at all. I have even seen this done by distinguished members of this club, in the exuberance of their salad days as motorists. I believe if they look back now they will be contrite. Such conduct to those on foot or wheel, and to residents on the road, is as unworthy of good sportsmanship as it would be to force horses at a gallop through a crowded market place.

But the dust is objectionable even where the driving is considerate. The old mail coach raised dust terribly, but the crowd of auto cars makes it worse. Therefore, there can be no doubt that the repression of dust is a great question of the hour. That the roads can be brought into a practically dustless condition is, I think, certain. Experiment has proved this conclusively. All must rejoice to know that this matter is being taken up by a special committee representing all classes of interests, and that the feeling is growing that Government care of the roads and Government aid are the true means of solution of the problem.

The last enemy with whom we have to contend is the most deadly enemy of all—the foe of our own household—the inconsiderate driver, to whom allusion has already been made in speaking of the dust question. The man who holds the crown of the road, drives others to the ditch, bespatters them with mud or chokes them with dust, and dashes through villages, hoots his way past the church where worship is going on, can do more in one day to cause all motorists to be hated than all the considerate drivers can do in the way of conciliation in a month.

Let it be borne in mind that the man in the street is not a particularly observant animal. He too often sees through the grim spectacles of prejudice, put on his nose by others, and resists as long as he can the clear light of the logic of facts.

"The text that suits not with his darling whim,
Though plain to others, is obscure to him."

Let it be remembered that one of the reasons why every energy should be put out to counteract opposition is that much of that opposition is not reasonable, but wildly unreasoning, and because it so is much more difficult to meet. The knowledge that an opponent is actuated by passion rather than reason leads too often to an unwise complacency—the foolish belief that because you have reason on your side you may let things take their course. This is a mistake in every case, and in this case it would be a fatal mistake. Every energy must be put out to allay passion and to convince reason.

The purposes of this paper will have been served if I have been able to supply my audience with facts or arguments which they may use, and which I trust they will use, to create enthusiasm and activity among our friends, to win over the indifferent and the opposing, and to convince the implacable that it is vain to attempt to crush, and wise for them to be moderate, and so to win the good will of all the considerate among motorists, and their assistance in putting down those who, though motorists in one sense, are the worst foes of automobilism—the scorcher and the hooligan of the road; and in providing a road which will be free of mud in winter and of dust in summer.

An omnibus has been delivered at Tokio, where it awakened much curiosity, which could only be slaked by an immediate initiation into the sensation of riding in this European conveyance.

A NEW FRENCH RECRUIT TO THE TWO-CYCLE*

FRANCE has found herself in somewhat the same anomalous position that has existed for so long in this country, in that but one prominent firm has devoted itself to the building of motors of the two-cycle type for automobile use. There is now, however, a new entrant into this field abroad in the shape of the *Dubois et Uzac* car, which is of considerable interest from the fact that its builders have departed considerably from the beaten path in the design of their motor, though the latter is laid down along lines somewhat similar to those employed in the Wolverine and Smalley motors, both of American make. Neither the crankcase compression nor the auxiliary external pump types have been followed, the initial pressure necessary to deliver the fresh charge to the combustion chamber being obtained by the use of a differential piston, which differs considerably in detail, however, from others of this type that have been

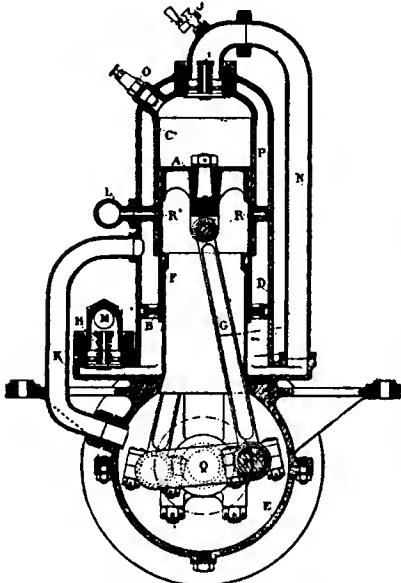


FIG. 1.—Sectional elevation Dubois motor.

built previously. This consists in the main of a central stationary tube provided with gas tight rings the same as the piston. Through this tube the connecting rod works the same as in the ordinary two or four-cycle motor. This tube is designated in the accompanying sectional elevation of the motor by the letter *F*. The piston itself is of the ordinary type so far as its upper part is concerned, but is of unusual length and at its lower end carries a collar or second annular piston *B*, also provided with a ring. As will be plain from the drawing, the piston bears externally against the cylinder wall and internally against the tube *F*. The latter, together with the outer wall of the motor, forms an annular chamber in which the piston *B* works.

Great Economy in Fuel Consumption.

According to the builders this arrangement results in the reduction of the friction to a minimum and no leakage is possible. A model motor built on this system, having a bore and stroke of 90 mm. (3 1-2 by 3 1-2 inches), installed in a 25-foot motor boat, weighing, with ten passengers aboard, in the neighborhood of 1,500 kilos (3,300 pounds), drove it at an average speed of 13 kilometers, or approximately eight miles an hour, on a consumption of but two liters per hour, or little less than half a gallon. During the course of the past year the same boat has covered 5,000 kilometers without any engine troubles. On a four-cylinder car rated at 30 horsepower, the cylinders of which measure approximately 4 1-4 by 4 1-2 inches, it was never found necessary to provide more than 16 liters per 100 kilometers, or about 3 1-2 gallons for 65 miles. A means of readily reversing the engine by means of the ignition, through a special system of wiring upon which the builders hold patents both in France and abroad, makes the motor particularly convenient for marine use.

The advantages of the motor will be more clear from a description of its construction and method of operation. Re-

ferring to the sectional elevation, Fig. 1, it will be seen that the cylinder is water-jacketed about the combustion chamber, the jacket *P* only covering the upper part of the cylinder. The lower portion of the cylinder is bored concentrically with the combustion chamber, its diameter being half again as large as the latter. In this double cylinder the pistons *A* and *B*, which are in one piece, move in the chambers *C* and *D* and are attached to the connecting rod *G*, while *Q* and *E* represent the crankshaft and crankcase respectively. The latter carries the central tube *F*, which is provided with piston rings at its upper end, while at its lower end it is made somewhat bell-mouthed to clear the connecting rod and is provided with an extension base by means of which it is fastened to the crankcase.

Details of Motor Construction.

In the head of the cylinder *C* there is inserted an automatic inlet valve *I*, while the lower cylinder *D* is provided with a second inlet valve of the same type communicating with the carbureter. The pipe *N* connects the cylinder *D* with the combustion chamber *C* through the medium of the first inlet valve mentioned, while the exhaust gases escape from the cylinder through the ports *RR* and the pipe *L*. At its upper end the cylinder *D* is provided with an opening which communicates with the crankcase through the medium of the pipe *K*. The cylinders *CD* are cast integral with their base, the same as the central tube *F*, which permits of the ready mounting of the whole on the crankcase by means of gudgeon pins and screws. The remainder of the details of the construction will be plain from the cross sectional view which has been referred to in the course of the above description.

The sequence of the various functions in the cycle of the motor are as follows: Assuming the pistons to be at the lower end of their stroke, and the combustion chamber *C* full of fresh gas, the piston *A* on its upward stroke will compress the gas and at the same time the lower piston *B* will aspire another fresh charge into the chamber formed by the wall *D* and the central tube *F*, through the valve *H*, which, owing to the depression produced by the upward travel of this piston, remains open during the entire stroke. At the end of the latter the charge is fired, the spark plug *O* being located near the inlet valve and placed at an angle. On the downward or power stroke, the fresh charge which has just been drawn into *D* is compressed by the piston *B* until the piston *A* reaches the end of its stroke, uncovering the exhaust ports *RR*, permitting the escape of the burned charge. The depression caused by the latter then causes the inlet valve *I*, in the head of the cylinder, to open and a fresh charge passes into the combustion chamber, aiding in the expulsion of the exhaust gases. This remains open for a considerable portion of the upward stroke of the piston *A*, or until the compression of the charge overcomes

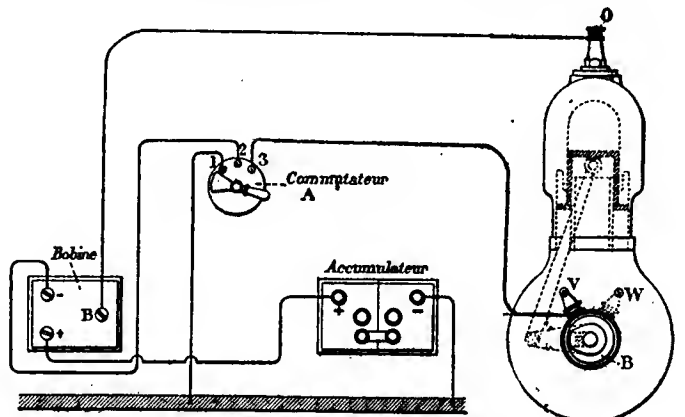


FIG. 2.—Wiring diagram for reversing Dubois two-cycle motor.

*Translation from *L'Automobile*, by Charles B. Hayward.

the pressure on the other side of the valve. During this operation the cylinder *D* has again been replenished through *H*. The volume of *D* is slightly greater than that of *C* and the compression created by the piston *B* is calculated to insure a fresh charge sufficient to fill *C*. The speed and power are

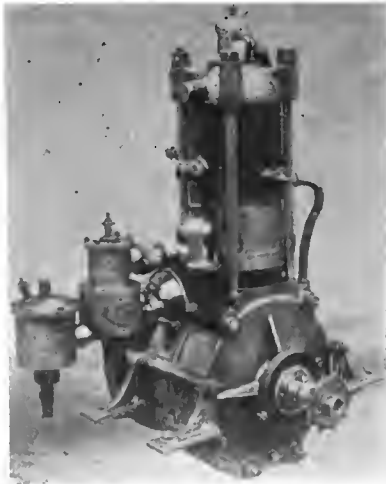


FIG. 3.—Nine horsepower marine motor.

varied by throttling the mixture at the carbureter and advancing or retarding the point of ignition. If the ignition should be cut off when the motor is running, it will come to a stop after several revolutions, but, as has already been made plain, the charges under the initial compression given them in the cylinder *D* are conducted to *C* through *N* and are there recompressed prior to ignition. It is evident that the motor cannot come to a halt until the pressures in *C* and *D* reach a point of equilibrium, and at that moment the pistons must always be half way up or down in the course of their stroke, a position horizontal to the axis of the motor, the balance of the pistons and cranks aiding in this result. From this it will be apparent that the motor can never come to a stop on a dead center, and by means of a special form of commutator the motor is made self-starting in either direction.

Details of the Ignition System.

The high-tension system of ignition is employed, the spark plug *O* is connected to the positive pole of the secondary winding of the coil, the other being grounded, while the positive terminal of the accumulator is connected to the positive end of the primary winding and the other side—the negative of the accumulator—is grounded. The switch *A*, shown in Fig. 2, is provided with three points, number one being grounded, number two to terminal of the induction coil, and number three to the timer *B* on the motor, the switch lever being designed to cover two of the points at once. For instance, the motor has stopped with crank to the left of the axis of the motor, and it is desired to start on the reverse—that is, from right to left. The timer *B* on the motor is turned to the position *V*, a point corresponding to that of maximum retardation on the reverse, and at the same time the switch lever of *A* is turned to cover two and three. The first explosion suffices to start the mixture

flowing through *N* and it is then only necessary to alter the speed by advancing the spark or opening the throttle. To cite another example, let it be assumed that the motor has stopped in the same position as above mentioned, and it is desired to start it running ahead—that is, from left to right. The timer is then placed in the position *W*, corresponding to the point of maximum retardation when running ahead or normally. The switch lever is turned to cover the points 1 and 2. The first stroke will be in the reverse direction and immediately after its occurrence the switch is moved to cover the points 2 and 3, and as the next charge sent into the cylinder through *N* cannot be fired until contact is made at *B*, this causes the next stroke to occur in the opposite direction and the motor then takes up its cycle, regularly running forward. To speed up the motor it is only necessary to advance the spark as in the former instance.

These two examples demonstrate that, whether the crank stops to the right or to the left of the axis of the motor, and as already mentioned it cannot stop at any other points, the motor can be started ahead or on the reverse simply by shifting the position of the timer *B* and the closing of the primary circuit by the switch *A*. When under way, contrary to the method used in starting, the reverse is obtained simply by cutting out the ignition momentarily and then giving it an excessive advance, which causes a premature explosion and starts the motor in the opposite direction, after which the timer is immediately returned to the running point desired.

Lubrication is provided for as follows: The tube *K* unites the crankcase *E* with the upper part of the cylinder *D*. In the part of the cylinder in question a depression is produced by the descent of the piston *B*, and this space is filled by the pressure created in the opposite direction by the descent of the same piston in the crankcase. The big end and main bearings are lubricated by the splash of the oil in the bottom of the crankcase and the circulation of air set up by the means just described suffices to carry considerable of the oil up into the chamber *D*, effectively oiling the pistons *A* and *B*. This system is necessarily proportioned to the speed of the motor and ceases immediately the latter stops. The level of the oil in the crankcase is maintained constant by a float-feed placed in the supply pipe. There seems to be little doubt that the attention of a few large manufacturers on the Continent, if devoted to the development of the two-cycle motor with the success that has apparently rewarded the inventor's efforts in this case, would be of far-reaching benefit to the automobile industry the world over. Particularly where the French industry is concerned, the two-cycle type of motor appears to have suffered more from inattention than anything else—neglect, it might be called.

"ELECTRICITY ONLY WARMS THE BIRD'S FEET."

Every now and again the "automobile reporter" of some daily is assigned to cover an accident or an interview and the way he dishes it up is something to make the informer's hair stand straight on end. Two of New York's leading and most respected dailies in the course of the description of an accident that was accorded a top of column, front page position, with display head, and in which an elderly woman had been run down by an auto on Broadway, made the statement that her clothes had caught fire from "hot coals dropping from the carbureter." Of much more recent occurrence is the deviation from the straight path of technical rectitude of that scribe who quoted a well-known designer as saying that "the piston rod of a gas engine worked up and down in the cylinder, accelerated by the explosions in the carbureter, which was the reason why the stroke could not be made longer." These and their kind are certainly diverting and seldom do any harm, but such can hardly be said of the break of the editor of an automobile paper, who, in answering an inquiry as to why birds alighting on electric wires were not killed by the current, naively stated that the "electricity only warmed their feet."

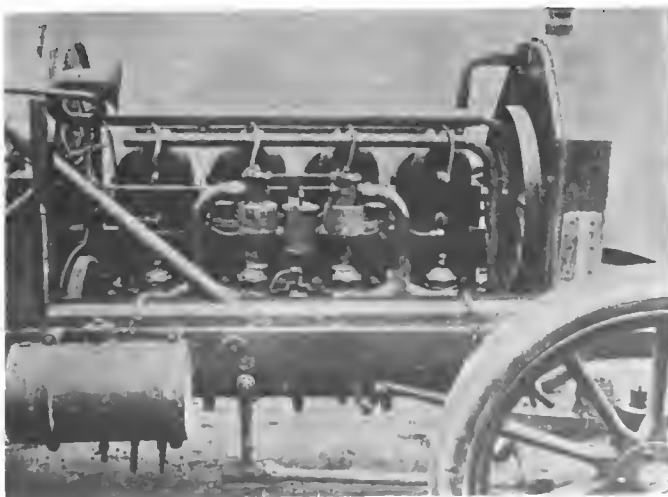


FIG. 4.—Carbureter side, four-cylinder motor on car.

LETTERS INTERESTING AND INSTRUCTIVE

The Noise Made by Valves.

Editor THE AUTOMOBILE:

[657.]—I have a four-cylinder touring car, of 24-horsepower, which seems to me to have very noisy valves. The car is a 1907 model, and with this exception runs as quietly as an electric. The muffling is beyond criticism, there is no perceptible noise from the gears, and the squeaking and creaking that accompanies the progress of so many cars is entirely absent. But the valves keep up a most interminable clacking—perhaps no worse than with other cars, but made more pronounced by the absence of other noises—and if it is possible I would like to remedy this defect, to which end I will be pleased to receive any suggestions you or your readers may have to offer. Is there anything about the valve seatings, the amount of lift, or the adjustment or form of cams that change the conditions so that less noise will be made?

Denver, Colo.

DR. B. A. PEABODY.

Ordinary poppet valves are perhaps the most difficult detail involved in the mechanism of a modern high-grade car to make very silent. The very nature of their operation, requiring sudden lifting and a return to a metal seat, makes it impossible to expect an absolute elimination of noise from such sudden clashing of metal-to-metal surfaces. Much can be done, however, in the design of an engine, to reduce the noise by a judicious proportioning of valve lifts and diameters. The present prevalence towards valves of large diameter and very slight lift is an expression of this tendency. Also, valves with flat instead of beveled or mitered seats are coming widely into use because they afford a given opening with the least lift. The objection to valves of large area, especially exhaust valves, is that they require proportionately heavier and more durable cam mechanism to open them against the residual pressures within the cylinders, without entailing undue wear. A further objection, from your particular standpoint, is that the design of your motor is likely to be such that any increase in valve diameters is likely to prove exceedingly expensive, if not absolutely impracticable. Reduction of the lift is less difficult, but should not be done unless you can change to flat seats. Possibly your trouble may be due to an often-neglected detail of cam design—the form of the closing contour. If this is too abrupt, the closing means may snap the valve to its seat much quicker than is desirable. Sometimes changes in the exhaust or intake piping will reduce valve noise. Aluminum intake manifolds are especially apt to possess a certain resonance which seems almost to magnify small noises, while the presence of small openings in intake manifolds is another cause of noise escaping, which otherwise might be very effectively smothered.

No Symptoms from Which to Make Diagnosis.

Editor THE AUTOMOBILE:

[658.]—Will you kindly answer the following through the columns of your journal?

Can you inform me how I can get more power out of my single-cylinder car? The engine seems to work all right, and also the spark coil and plug, yet it does not seem to develop the power it is rated, which is four horsepower. It seems to be all it can do to climb a 5 per cent. hill.

Meshoppen, Pa.

H. N. F. C.

Without knowing anything further than the meagre account that you give in your letter, it is next to impossible to state with any degree of certainty just why your motor does not develop a greater amount of power. There are several things that may be wrong. The valves may need regrinding or the piston rings replacing, or again the only trouble may be that one of the brakes on the car is dragging. The mere fact that the engine apparently runs all right is an indication of nothing more than that it is not deranged to the extent of preventing its operation. Under such circumstances the compression would naturally seem to be the first thing to investigate, as, if it be efficient in this respect and responds readily to the spark and throttle, there is no reason why it should not develop its full rated output.

Vibrators in Vacuo.

Editor THE AUTOMOBILE:

[659.]—Why would it not be a good idea, in the attempt to refine ignition systems to a maximum of efficiency and reliability, to seal the vibrators in exhausted glass bulbs, within which they would be protected from most of the troubles that now cause their uncertain working? The use of a vacuum in this way would prevent the corrosion between contact points, which is due to the oxidizing effect of the air, and would do away with the mechanical lag of setting the vibrator in motion, which is principally because of the air resistance. There would be no possibility of changing the adjustment, but this would be an advantage rather than an objection, because a proper adjustment could be made beforehand, and afterwards this adjustment could not change because of the complete protection from disturbing factors.

Hagerstown, Md.

HOWARD CUSHMAN.

While the plan you suggest might prove to have some advantages, it is very doubtful if they would be exactly as you state them. In the first place, the "corrosion" you refer to is not so much corrosion as it is an actual fusing away of minute particles of the contact points—an action that would continue to take place in a vacuum about as readily as in air. This effect, therefore, would sooner or later disturb the adjustment, just as it does now, making readjustment, through some ready provision for it, imperative. And if such a necessity arose, as it undoubtedly would, it is not likely that the average motorist would be inclined to enthuse over a construction that placed all means of adjustment absolutely out of his reach. As for the lag, this certainly is attributable almost solely to the inertia of the vibrator blade, for the amplitude of the vibration is too small to make air resistance a serious factor, except as it may possibly prevent, after the movement is under way, as rapid a vibration as might be produced in a vacuum. In connection with certain automatic-telegraph experiments, as well as in some "seeing-by-wire" devices, we believe the vacuum-surrounded vibrator has been utilized to some extent.

Positive Functioning Under Throttled Condition.

Editor THE AUTOMOBILE:

[660.]—What is the degree of compression, in pounds per square inch, now most preferred in automobile engines? Is it not a fact that most automobiles are much overpowered, with the result that normally the engines work under considerable throttling? And if the foregoing is a fair statement of the case, what becomes of the advantages of compression when only a comparatively small charge is inspired, with the result that the compression is lowered in proportion?

CHAS. M. ENGELHARDT.

Springfield, Mass.

Your questions all strike at what is a widely-admitted fault of modern internal-combustion engines. No mechanism is perfect, and the variable compression with variable throttling, which is a feature of current gasoline-motor practise, perhaps may be regarded as an imperfection. On the other hand, the system used with the Adams-Farwell car, of deliberately varying the compression by inspiring full charges and afterwards blowing out a proportion of each, might be held to support a contrary view, since it is used very successfully. Nevertheless, there is no question about the facts as you state them. Experience has proved it expedient to propel cars by very powerful motors, capable of making good speed up the worst hills and over the hardest going. The unavoidable result is that under less strenuous conditions only a fraction of the maximum power available is required, and, therefore, with the best-established means of control over power output, the compression must be diminished by the wire-drawing consequent upon throttling. One well-known American engineer—the designer of a foremost American car—recently patented a system of control providing constant compression through the use of air volumes, containing no fuel, introduced within the cylinder but kept separate

from the throttled charge by an application of the principle of stratification. All of this, of course, applies specifically to the four-cycle engine. With two-cycle engines practically constant compression is maintained, because, under throttling, in proportion as less charge is admitted more exhaust is retained, the result being a practically invariable total. The real gain is less than might appear, however, since the mixture is exceedingly adulterated and impoverished. For example, if the charge is throttled to one-sixth of its maximum volume, and contains one-tenth part of gasoline vapor (both usual figures), the effect upon the cylinder contents is best expressed in the fact that they then consist of one volume of gasoline vapor, nine volumes of air and fifty volumes of inert gases—incidentally proving that mixtures very much leaner than are commonly approved can be used with a high degree of success.

"Starting on Compression" Again.

Editor THE AUTOMOBILE:

[661.]—Some weeks ago, the statement appeared in your paper, in an answer to one of your correspondents, that an automobile engine would not "hold compression," and that when an engine started by the spark it did so by the explosion of "uncompressed mixture." If this is true, and uncompressed mixture will give such a powerful impulse, why are engines not made to run without compression? It seems to me that it is one thing to sit in an office and undertake to give right answers to every question that anyone can ask, but it is quite another to get practical experience by running cars, which is the only real way to know what we are talking about.

M. A. MULLINS.

Reading, Pa.

Your outspoken skepticism concerning the authority of our answer to a certain question apparently fails to take into account the fact that there are thousands of internal-combustion engines to-day in use which run altogether without compression. An engine cycle in which compression is not used will fail to give as high explosion pressure or as great efficiency as when compression is used, but as far as mere working is concerned it works very well. So you may regard it as well established that an uncompressed mixture will upon ignition give an impulse amply powerful to turn over an automobile engine declutched from the driving mechanism. As for our presumption in undertaking to give right answers to every question that any one can ask, if you will refer to your files of THE AUTOMOBILE and glance back over the correspondence columns you will find that we have not infrequently failed to give satisfactory answers, apparently because we are no more infallible than you seem to regard us. We are always pleased to hear from a reader who can explain something better than we can ourselves. We have, however, access to a few cars from which we occasionally gain a little practical experience. Because of this we know that if you have a car that starts from a spark it will also start equally well if you first open the petcocks and absolutely relieve every trace of residual compression. Try it and see.

Some Ignition and Carburetion Queries.

Editor THE AUTOMOBILE:

[662.]—I have a few questions that I would like to have answered, if it is not too much trouble: (1) How high a battery voltage would a Pittsfield quad coil stand without danger of burning? (2) Will an ordinary carburetor carburet kerosene without a heating jacket? (3) Has anyone ever equipped a car with two fuel tanks, one for gasoline and one for kerosene, using the gasoline to start the motor and kerosene to run on after the motor is warmed up? (4) I have seen porcelain spark plugs chipped and broken at the hot end. Now, it seems to me that the pieces of porcelain must have been hammered to pieces by piston. Now, if such be the case, are they likely to do serious damage to the motor?

Moline, Mich.

A SUBSCRIBER.

(1) Not knowing exactly the amount and size of the wire used on the coils you mention, we cannot accurately state the potential that they will stand without a breakdown in the insulation, commonly known as burning out. Coils for ignition purposes, however, are generally wound to take current at a

potential of six volts, and anything over this is not advisable. Of course, all coils have a factor of safety and are capable of standing an overload, which is what subjecting them to a higher voltage than they are designed for amounts to, and the proportion that this factor of safety bears to the normal capacity of the coil represents the limit to which the potential may be increased without damaging it, assuming meanwhile that the amount of current remains the same, only the voltage being increased. For instance, a six-volt coil with a factor of safety of 100 per cent. would be capable of standing a potential of twelve volts. This matter was discussed somewhat at length under the caption of "Increasing the Dose Is Apt to Be Dangerous," which appeared in the issue of January 24, 1907, of THE AUTOMOBILE.

(2) It will if it can be maintained at the proper temperature by some other means, as a much greater amount of heat is required to properly vaporize kerosene than lighter fuels, regardless of the manner in which it is applied

(3) We have come across instances of this kind from time to time in looking through foreign automobile periodicals, but do not know of any cases where it has been done on this side of the Atlantic. In one of the cases referred to, a Scotch motorist gave his experience with kerosene over a period of two or three years.

(4) The plugs have not been "hammered" to pieces by the pistons, as you surmise, but have succumbed to the intense heat and vibration. The porcelain of which the insulating core of a spark plug is made is an abrasive and if it managed to get in between the piston and the cylinder walls, as would most likely be the case in a vertical engine, it would do damage. We should think, however, that the particles would be of such small size as to be blown out the exhaust in the great majority of cases.

Direct Current Dynamo for Ignition.

Editor THE AUTOMOBILE:

[663.]—Will you be good enough to answer a question through the columns of your journal, which we read with increasing interest in each number. We have a single cylinder car that we use in connection with our business, and we find trouble in getting good dry batteries; they soon run down and are not dependable; we are a long distance from factories and any headquarters for motor supplies, and suspect that most of the batteries we get are old.

Can we put an Apple, or other make of dynamo on our car, run it by friction from the flywheel, and get what current we need without the use of dry batteries or any other form of stored current? We saw in a recent issue of "The Automobile" where a subscriber had used one on an Elmore car with good success. Is such a scheme practicable, and, if so, please give directions how to connect same, and if practicable, why are they not generally used on all cars? What are the faults? If the scheme is all right, please give size or number of dynamo required and address of concern manufacturing same.

SINGLE CYLINDER.

Charlottetown, P. E. I.

Small direct current dynamos such as you mention are largely used and are usually driven by friction from the periphery of the flywheel, so that there is no reason why you cannot successfully apply such a system to your car. In earlier days, the principal faults with the small dynamo were its small capacity, i.e., current output, and the crude type of governor used, which frequently failed to work and caused the dynamo to burn out when the engine raced. We believe these faults have been entirely overcome long since. Regarding size required and details of installation, we prefer to refer you to the makers, whose announcement you will find in our advertising columns.

Advantages of Offsetting the Cylinders.

Editor THE AUTOMOBILE:

[664.]—Will you be kind enough please to give me some information in regard to the advantages and the disadvantages of offset cylinders. I am constructing an engine 4-3-4 by 5-1-2, and am interested whether or not to set off the cylinders 7-8 inch. Knowing that you are in a position to furnish direct and intelligent information on a subject of this kind, I take this means of requesting same.

R. W. BLAKE.

Bryn Mawr, Pa.

The question of offsetting the cylinders on the crankshaft is not a new one by any means, though many are under the impression that it is something that is the outgrowth of the development of the internal combustion motor; but such is not the case, as it was used on old-time single-acting steam engines many years ago. As is well known, the internal combustion motor, particularly as employed on the automobile and in the motor boat, does practically all its work on one stroke. The exhaust stroke is an idle one and on the compression stroke comparatively little work is done, so that the side-thrust of the piston against the cylinder wall, due to the angularity necessitated by the use of a short stroke and connecting rod, is concentrated on the power stroke. To overcome this, a great many makers have adopted the plan of offsetting the cylinders. The amount to which this should be done in order to gain the greatest advantage will be found at a point where the thrust is lessened to the greatest degree on the power stroke and at the same time not increased excessively on the compression stroke, otherwise the desired advantage is apt to be lost due to the thrust set up by the excessive angularity of the connecting rod on the latter.

The offsetting is usually calculated with reference to the length of the stroke and varies from 10 to 25 per cent., although in the case of the Armstrong marine motor, which is an extreme, the offset given is the equivalent of the length of the crankthrow. The Duryea motor—the first of its kind in this country—is offset 3-4 inch in 5, or 15 per cent.; in the Moore but 3-8 inch offset is given, while in the Craig-Toledo it is 1 1-4 in 5, or 25 per cent. The Rambler closely approaches this, but the same effect is obtained by offsetting the connecting rod on the piston, instead of altering the relative positions of the cylinders and crankcase. The actual amount given is 1 1-8 inches in 5 1-2, or 20 per cent. In the case of the American Mors it is 1 inch in 6, or slightly over 16 per cent. Other American makers who have adopted the principle are the Winton, Aerocar, Berkshire, Frayer-Miller, American, St. Louis, Frontenac, Simplicity, American motor truck, Dolson and Austin.

Compression Data and High-Speed Engines.

Editor THE AUTOMOBILE:

[665.]—I would like to have you answer the following questions through the columns of your paper. In speaking of compression I mean the difference due to design, and not to leaks of any kind.

(1) Does the speed of an engine vary when the compression is changed, or what effect does increasing the compression have on the speed, other things being equal?

(2) If the speed of an engine varies with the compression, in what ratio does it vary?

(3) Principally, how does a high-speed engine differ from a low-speed engine.

(4) Why will not a high-speed engine work well at a low speed?

(5) If an engine with large valves and high compression will work at high speed, will same work well at low speed if compression is lowered?

(6) What is the average compression used on American road machines and that on track machines; that is, pressure in pounds and percentage of compression space?

(7) Can you tell me where I can obtain books on gasoline engine design that will give all formulas, etc., for automobile engine design?

A. H. CAIN.

Roodhouse, Ill.

(1) It does. The speed is increased.

(2) This is somewhat of a poser to answer offhand. We cannot enlighten you as to exactly what relation the compression bears to the speed. Probably some of our subscribers who are more conversant with the subject will come to the rescue. Hiscox gives a table of data showing a comparison of the theoretical and actual efficiencies of a four-cycle gas engine with varying compression and also a table of compression pressures and clearance ratios, but so far as known there are no data extant in the shape of a compression and speed table.

(3) The chief difference between the design of a high-speed and low-speed engine is to be found in the length of the stroke.

(4) Principally because, at a low speed, it is only receiving a fraction of the impulses per minute that it was designed to

receive. This on the presumption that by working well you mean delivering a proportionate part of its rated output at a low speed.

(5) It will probably work satisfactorily for all ordinary purposes, though such a radical change in the design is apt to be detrimental to its efficiency.

(6) Doubtless 60 to 70 pounds represents a close approximation to the average compression of American cars, with a slight increase in the case of specially designed racing machines. It is customary to make the compression space 25 to 33 1-3 per cent. of the volume displaced by the piston, these figures probably representing the two extremes of current practise, so that something like 29 to 30 per cent. might be considered a fair average.

(7) We have sent you a catalogue under separate cover.

Probable Life of the Ignition Magneto.

Editor THE AUTOMOBILE:

[666.]—Will you kindly tell me through your question department whether or not a magneto will generate a magnetic current indefinitely. If not, what time would be its probable life if used on an automobile? You will greatly oblige.

C. F. NIXON.

Leominster, Mass.

We presume your question is as to the probable life of the magnets—in other words, how long will the magnetic field of a magneto retain its strength?—for as soon as the latter fails the machine will no longer generate a current when run. A magneto generates an alternating electric current as ordinarily constituted, or a direct current when equipped with a commutator. The word current is not ordinarily used in connection with magnetism. No magnet will retain its strength indefinitely, but we have known magnetos of the class used on telephones, which are practically the same as those used for low tension ignition, barring their smaller size, to be apparently as strong as ever after fifteen or sixteen years of constant service. Heat and vibration are both detrimental to magnetism, but the chief cause of its loss is the removal of the armature from between the pole pieces, leaving the magnets stand in this condition. There has been a vast amount of misconception on this point, where the automobile magneto is concerned, and much of it still exists. Popular knowledge as to the essentials of the magneto is so scant and usually so erroneous that the failure of the magneto to work from almost any old cause has usually been put down to a failure of the field magnets. We have known of one or two instances where an autoist has returned his magneto to the maker with instructions to remagnetize the field, as it had become weak, when nothing but cleaning or a little adjustment was required. As the maker does not go to the trouble to disillusionize the customer, the latter thinks he has successfully diagnosed the trouble and leads others to think likewise. No instance has ever come to our knowledge where a properly constructed and cared for magneto has lost its magnetism to an extent sufficient to interfere with its working. We should say the magnets were good for eight to ten years at the least; remagnetization can be done in a few minutes at a cost of a dollar or less.

Influence of Auxiliary Exhaust on Inlet Valve.

Editor THE AUTOMOBILE:

[667.]—I have a four-cylinder 1904 car, and last year bought new cylinders and necessary parts for the auxiliary exhaust. After fitting these carefully, I could never get more than half the power out of the engine, but after cutting out the auxiliary exhaust the car worked as good as it ever did.

The makers of the car insisted that the engine was not properly adjusted or it would work with the auxiliary, and asked to have the car brought to the factory. This I did, and after a week or ten days' testing and adjusting, decided that it would not work with the auxiliary on account of the automatic intake—consequently the auxiliary was cut out permanently for the season.

Now I can't understand what the automatic intake has to do with the auxiliary exhaust, which is fitted with check valves. Perhaps some of your subscribers can explain. I will now fit my engine with the mechanical intake, hoping that the results will be satisfactory. Any information on the subject will be appreciated.

Watertown, N. Y.

C. D. W.

We are not sufficiently familiar with the design of your car, particularly in its rebuilt condition, to be able to throw much light on the matter regarding which you inquire. On general principles, however, we should say that in all probability the reason why the auxiliary exhaust deranges the working of the automatic inlet valve is to be found in the fact that the former tends to equalize the pressure in the cylinder with that of the atmosphere at the end of the exhaust phase, thus preventing the formation of a vacuum in the cylinder and in consequence the working of the inlet, which depends upon this. If there is an appreciable difference between the pressure in the cylinder and that of the atmosphere the inlet valve is bound to open on the suction stroke, unless prevented by too stiff a spring, or similar cause, which we presume is hardly likely to exist in view of the investigation you mention. We have no doubt that the fitting of mechanically operated valves will entirely eradicate the trouble.

A Criticism of No. 585 from Abroad.

Editor THE AUTOMOBILE:

[668.]—Your interesting paper reaches me regularly, and I am much interested in its contents. In looking through the issue of February 21, you have under the heading, "A Twenty-five Per Cent. Grade About the Limit," an inquiry, No. 585, to which you



WINTON CLIMBING ONE-IN-FOUR GRADE AT PRESTON, ENG.

reply stating certain facts as to the hill-climbing power of automobiles. It is dealing with this heading that I should like to call your attention to the illustration on page 31 of the accompanying catalogue, together with a surveyor's certificate of the gradient up which the car is pictured climbing. The surface of this hill, as can be seen by the illustration, is exceedingly bad, but, in spite of this, the Winton Model "K" had no difficulty whatever in negotiating it. If you think the matter of sufficient interest to your readers, you can make what use of it you like.

You may have a representative over here on a trip shortly, and I shall be glad to meet him and show him the fine premises owned by the Winton Motor Carriage Company in London, where they possess a floor space of no less than 13,000 square feet on one of the main arteries of London.

W. L. DUCK, Mgr.,
WINTON MOTOR CARRIAGE COMPANY.
London, S. W., Eng.

The surveyor's certificate mentioned is to the effect that the hill in question is 495 feet long and on the first hundred feet has a rise or inclination of one in six, while on the last 150 feet, which is the steepest part of the hill, the rise is one in four.

A Simple Method of Figuring Horsepower.

Editor THE AUTOMOBILE:

[669.]—Referring to Letter No. 600, under the head of "Data Wanted on Engine Testing," I have a simple and practical formula or method of computing brake horsepower taken from about 100 brake tests of different makers and dimensions. It is horsepower equals total volume in cubic inches per minute divided by 5,000; or, formula equals V.P.M.C. divided by 5,000; or total volume per

hour in cubic feet divided by 173.7 equals horsepower. Formula equals $\frac{T. VP H}{173.7}$ equals horsepower.

I will forward the details of these results of figures if you wish them.
R. C. MATLACK.
Chicago, Ill.

We have no doubt that the figures resulting from such a number of tests of different makes of engines would be interesting and would be pleased to see them.

TWO SOLUTIONS OF THE MYSTERY OF NO. "636."

Editor THE AUTOMOBILE:

[670.]—In your issue of March 14, letter No. 636, re "mystery." This is certainly an interesting occurrence, and would probably puzzle anyone not versed with the nature of acetylene. If I understand aright, the copper tubing was used to convey the acetylene from the generator to the lamps, and it was certainly an error to employ copper for the purpose. Acetylene coming in contact with copper will form a deposit which we might call electrolyte, which, when treated violently, will break, and on breaking produce a visible spark. Of course, there must have been an explosive mixture, which ignited to produce the detonation. Writer has observed copper pins used in an acetylene generator, and has produced visible sparks from same by cutting through the upper crust with a knife.

I trust this will enlighten my friend Burtiss.
St. Williams, Ont., Can. R. KURTZ.

ACETYLENE AND THE PRESENCE OF MOISTURE.

Editor THE AUTOMOBILE:

[671.]—I would submit the following as an answer to No. 636: Acetylene gas in presence of moisture produces an explosive compound from copper, called copper acetylde ($C_2 Cu$), and when dry it explodes very easily from friction or blow, or when heated to 120°. It was owing to this explosive compound (formed inside the copper tubes by the acetylene gas, containing a percentage of water vapor, produced from heat of the carbide in the generator) and not to any remaining gas in the tubes that caused the fireworks. Perfectly dry acetylene gas, as sold by the Prest-o-Lite people in their storage tanks, will not form this compound to any extent, as moisture is necessary to the chemical reaction.

Akron, O. C. A. WILLIAMS.

SHEDDING A LITTLE LIGHT ON NO. 633.

Editor THE AUTOMOBILE:

[672.]—In reference to query No. 663, I think I can possibly shed some light on the subject referred to therein. I have heard it said that the rate of propagation of ignition of gasoline vapor to be 60 feet per second, under normal, that is, atmospheric pressure, and that this rate is directly proportional to the pressure. My authority for this statement is the mechanical engineer of one of the largest automobile factories in the country.

Cleveland, O. CHARLES E. BAILEY.

IN EXPLANATION OF "631's" QUERY.

Editor THE AUTOMOBILE:

[673.]—In re letter No. 631—"A Peculiar Trouble." I have noticed the same trouble in lubrication of six-cylinder engines, and believe it to be caused by the crankcase, for the oil always leaves the section which vibrates most and works toward the section which vibrates least. I have never seen this trouble in six-cylinder engines which have every other partition light, with no passage over the top.

H. A. S.

STATIC ELECTRICITY SUGGESTED AS CAUSE.

Editor THE AUTOMOBILE:

[674.]—In reference to B. A. Burtiss' letter No. 636, I should say the gas was exploded by a spark, caused by the discharge of static electricity contained on his body to the copper tubes. I do not consider this as necessarily final, but merely give it as my opinion.

Morristown, N. J. W. G. HURTZIG.

WORTH THE PRICE OF A YEAR'S SUBSCRIPTION.

Editor THE AUTOMOBILE:

[675.]—Although I have been a reader of your magazine for some time, it is only recently that I have been a subscriber. I think that the page "Letters Interesting and Instructive" is worth the price that you ask for the whole magazine.

Rochester, N. Y. H. A. STRICKLAND.

FOR Those Who Tour To Virginia's Exposition



ON THE PICTURESQUE SHENANDOAH VALLEY PIKE, WHERE TOLL GATES ARE FREQUENT BUT THE ROADBED IS EXCELLENT.

INTEREST in automobile touring south of the Potomac river has been growing very rapidly for the last two or three years. The idea has been generally prevalent that tours in Virginia and towns south thereof should be undertaken with caution, on account of the bad state of the roads. This remains equally true to-day, and yet, with the increased capability of the automobile to cover long distances in almost any kind of country it is not surprising that actual trips have already been successfully carried through this section.

The most notable of these is perhaps the trip from New York to Ormond, Fla., made by an Oldsmobile touring car in December last, notes and map of which appeared in THE AUTOMOBILE at that time, together with a discussion of other possible routes through the South. As the Ormond-Daytona season is now practically over, it is probable that no more trips through to Florida will be undertaken, at least until next fall.

On the other hand, interest in touring to and from the Jamestown Exposition, Norfolk, Va., has been increasing very rapidly. It has been suggested that this would be a good terminus for the 1907 A. A. A. tour, although the latter consensus of opinion seems to be that the hotel accommodations will be inadequate and the difficulties practically insurmountable for a large party.

This does not by any means lessen the interest in the route south of the Potomac, and the chances are that a number of individual trips will be made to and from the exposition, irrespective of whether or not the Glidden tour goes that way. Last summer Augustus Post, former chairman of the A. A. A. Touring Board, made a complete trip from the North to Jamestown by the way of Washington, Hagerstown, the Shenandoah Valley, Richmond and Norfolk. This preliminary

exploration was made by Mr. Post under the auspices of the Jamestown Exposition authorities, the Norfolk Automobile Club and the Richmond Automobile Club.

Full and complete notes were furnished by Mr. Post, both to the Exposition authorities and to "THE AUTOMOBILE Official A. A. A. Blue Book." In connection with the publication of this matter in the "Blue Book," a double page map of the Shenandoah Valley on the north and the Virginia coast on the southeast has been prepared for publication in the 1907 edition. The map referred to, somewhat reduced for convenient publication in THE AUTOMOBILE, is reproduced herewith in connection with an article by C. H. Claudy, dealing in a less detailed manner with a corresponding trip made by himself with a well-known autoist of Washington, D. C., over substantially the same territory.

The official route to the exposition, compiled by Mr. Post, will not be printed for some little time; its length precludes it from publication in THE AUTOMOBILE. Mr. Claudy's story, however, gives an interesting view of practically the same country as seen by himself, although in some particulars the trip made by him varies from that made by Mr. Post for the exposition. In that degree also it will vary from the map published herewith.

There are two ways of going from the capital of the United States to the capital of Virginia. One is by way of the old Telegraph road through Manassas and the other is to and through the Shenandoah Valley pike. The first is shorter, but very much rougher; the second, a longer route, yet allows much better time to be made on account of the good roads. No one ever having experienced the two would hesitate for an instant to choose the longer route, which is therefore given here as the most practical and satisfactory route to accept.



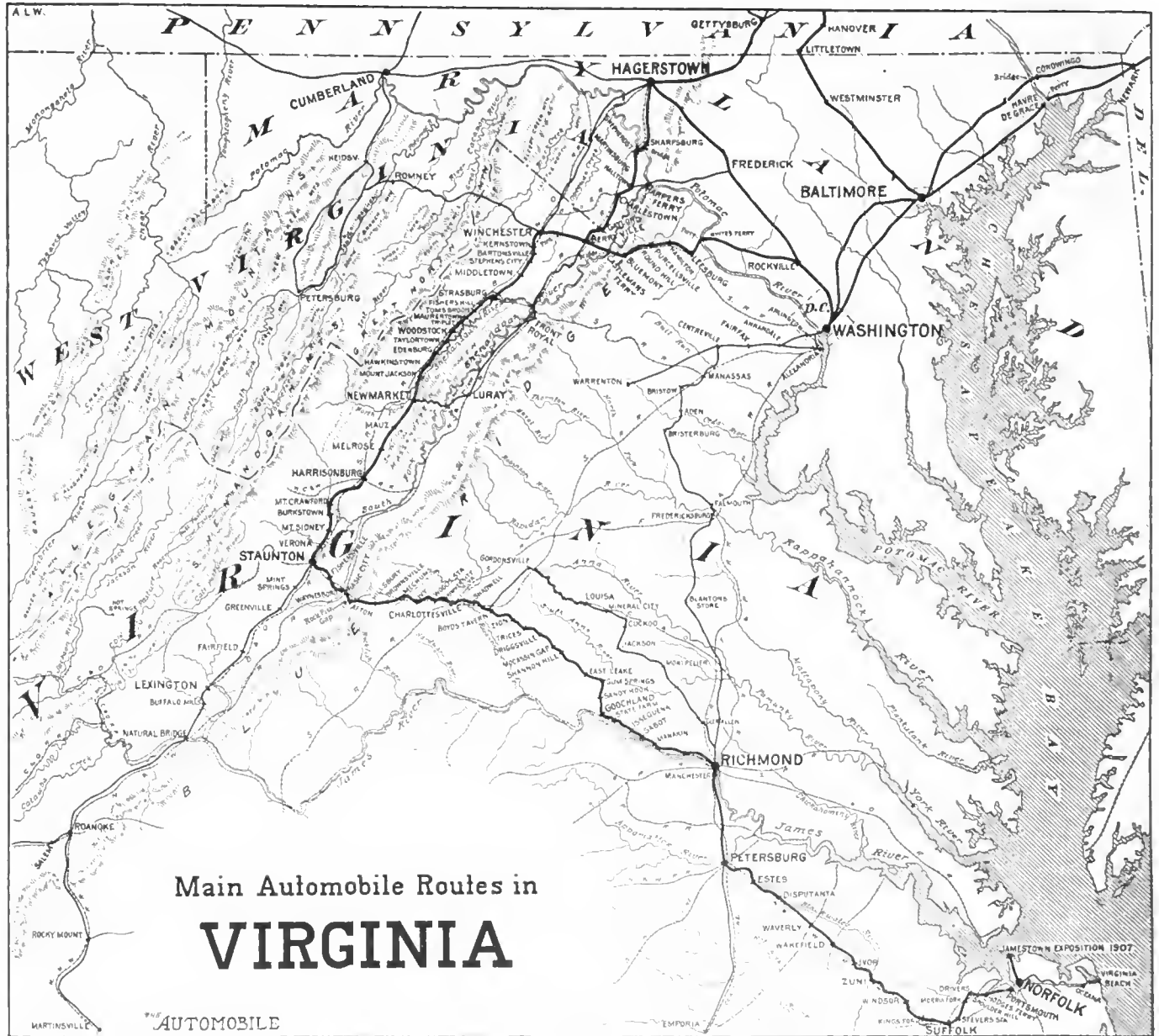
WHERE TIRE CHAINS ARE VERY USEFUL.

There are two ways of approaching the Valley pike from Washington. One is by way of Harper's Ferry, reached through Frederick, Jefferson, Weverton, Knoxville, Harper's Ferry, Charlestown, Berryville and Winchester. The other is by way of Rockville, Md., decidedly the shorter, equally good in road, but not so much good scenery.

Proceed out any lettered street in Washington westward to Thirty-second street; follow the car tracks north to Rockville, fourteen miles, over a very good country dirt road. Keep straight ahead through Rockville, over a country road running north, usually good, with occasional hills and rough places, to White's Ferry, over the Potomac, twenty-three miles from Rockville.

where a toll charge of 25 cents is made. Follow straight, though sometimes rough, road over the Gap and down the other side across a small ford and on to Castleman's Ferry (now a bridge). Run over the Shenandoah river, where a toll of \$1 is exacted, to Berryville, seventy and five-tenths miles, where again a toll of 25 cents is due.

Cross railroad tracks outside of Berryville and pay another 25 cents toll, eighty-two miles. At Winchester bear sharply to the left out Braddock street and pass through three toll gates to Strasburg, where take local directions for Woodstock (road turns sharp right), passing through three more 10-cent toll gates. Woodstock is 112 miles from Washington and a good place for a



Here cross the river on the ferry (ferriage 50 cents per car and four people) and climb the steep bank on the other side of the river. One mile further find the Leesburg turnpike, there bear left for Leesburg, Va., eight miles from White's Ferry and forty-five miles from Washington. Here find a toll gate, where a 10-cent toll is charged, and a book produced which the motorist must sign with name, address, number of Virginia license, direction going, and the date.

Proceed straight through Leesburg for Hamilton, Purcellville and Round Hill, all on the pike, which runs straight through them, for Bluemont, sixty-two and five-tenths miles from Washington. Here make sharp right turn for top of Snicker's Gap,

country meal. Proceed straight through on pike to Millertown, Hawkinstown and Mt. Jackson, toll gate at each place, with book to sign, to New Market, Va., 131 miles.

Visit Luray and the Caverns.

If no detours are to be made, pass straight through, but if possible to spare the time spend night here and turn sharp left next day for Luray and the Caverns, fourteen miles. Road is horribly rough and rocky, but can be covered inside of two hours with almost any machine and in one hour with a good climber. Road is plain, over Massanutten mountain, where a beautiful view is to be had, and 15 cents toll paid each way on top, four miles from

New Market. Cross ferry over Shenandoah at White House Ferry (25 cents), ten miles from New Market, and follow road to sign, making left-double-back, as sign points, to Luray Caverns.

Charges are from 50 cents to \$3 per head at Caves, depending on hours, whether excursion day or not, and number in party. Sight is most wonderful and beautiful and the hour and a half spent in Caves well worth the highest price charged. Luray Caves are said to be the most beautiful, though by no means the largest, in the world. Take dinner at Lawrence Hotel (in spite of contrary directions from ferryman, who "caps" for another hotel), one mile from Caverns. Gasoline can be obtained here if necessary.

Return same way to New Market, and from there proceed down pike to Harrisonburg, three toll gates, 150 miles from Washington. Harrisonburg has a garage, where a machine may be left over night at a charge of \$1, and gasoline obtained. Also very fine modern hotel, with rather poor café.

Toll Gates Are Very Numerous.

Leave Harrisonburg on pike for Staunton, passing through six toll gates, and having clear, straight road to Staunton, 177 miles from Washington. Staunton is a good-sized town; here garage and machine shop can be found, also gasoline and oil; Hotel Beverly is best in city. Leave Staunton by Johnson street for Waynesboro, twelve miles, over very good dirt road. Pike ends at Staunton. Waynesboro to Meechum's river is a hard pull, taking in a mountain pass (Rock Fish Gap), one mile up and one down the other side. This is as rough and rocky a stretch as it would be possible to negotiate a car over. By all means have and put on gripping chains, particularly in wet weather. Go very slowly and carefully down other side—dangerous to speeding. Meechum's river is seventeen miles from Waynesboro.

Here turn sharp right at railroad tracks and again sharp right 300 feet further on, to Charlottesville, forty miles from Staunton. Follow car tracks past University of Virginia down to business section. Here turn left on any cross street to High street. Out High to right to bridge, two miles, where turn right across bridge. Seven miles from Charlottesville take left fork at pretty country mansion called La Forche, for Gordonsville, twenty-one miles from Charlottesville. Road is fair out of Charlottesville, but gets worse as Gordonsville is approached, and is very bumpy last five miles; also very sticky in wet weather—chains are a necessity. Gordonsville has a very fair country hotel (Keegan House), where a good dinner can be secured, but the hotel is right on the railway and sleep is difficult. Gasoline sometimes to be had; if not here, then at Louisa Court House, which reach direct south from Gordonsville over fine country road. However, this run crosses the railway tracks fourteen times in the fifteen miles to Louisa. At Louisa gasoline is 25 cents per gallon.

Leave Louisa on straight road and first fork beyond turn left and follow railroad tracks to Mineral City, six miles. Two hundred yards beyond old mill at Mineral City take road to left across railroad and follow tracks to Cuckoo, five miles from Mineral City. Here take left fork in road to Jackson, seven miles over very poor, rough road; one mile below Jackson take right fork in road and follow sandy road, heavy going, to Montpelier, eleven miles. At Montpelier keep road to left and follow it to Glen Allen, where cross railroad tracks and get on pike again, twelve miles to Richmond. Three and one-half miles from Richmond pike becomes the Brook turnpike, with 20 cents' toll to pay, and road is then perfectly straight to Richmond, which enter straight and keep to Broad street, where turn left for Hotel Richmond.

Richmond is 314 miles from Washington, or, as you will go, including Luray, 343 miles. Gasoline can be obtained at the following places on the line: Leesburg, Woodstock, New Market, Luray, Harrisonburg, Staunton, Charlottesville, Gordonsville (probably), Louisa and Richmond.

Country people are kindly disposed towards automobilists, but expect and must receive consideration for horses, as many of the



A PRETTY GOOD FORD WHEN NEARING RICHMOND.

animals are spirited and badly frightened at the machine. Always stop at signal and help drivers, particularly women with horses. Horses prefer to be led past machine to having machine driven past them. Not much opportunity for speeding over thirty miles per hour anywhere, on account of teams, toll gates and turns in road; but scenery is very fine all the way and trip well worth taking. Total toll charges from Washington to Richmond, including ferriage and toll charges to Luray (not including Cavern fees), \$5.10.

A. C. A. TOUR TO JAMESTOWN EXPOSITION.

It is the intention of the Automobile Club of America to have a June tour to the Jamestown Exposition, limited to members of the club. The details will be announced shortly, and the route selected will be different from any one yet proposed. Chairman Waldron Williams of the Runs and Tours Committee, after consultation with Chairman Robert Lee Morrell of the Contest Committee, who is a New York State Commissioner of the Exposition, has about decided upon the Cape Charles route, which means that the run would be from New York to Philadelphia, to Cape Charles, whence ferry would be taken to Norfolk, the cars being carried on a freight transport and the tourists on a regular passenger boat. It is said that a fairly good road exists through the eastern shore of Maryland, and arrangements for a stopping place over night will be provided for by sleeping cars located at some point midway between Philadelphia and Cape Charles. The first night's stop would be in Philadelphia, the run there being 106 miles.



CROSSING A STRETCH OF SANDY ROAD NEAR WAVERLEY.

CLUBS PREPARING FOR THE SUMMER SEASON

Route for New Jersey Endurance Run Agreed Upon.

NEWARK, N. J., March 25.—At a full meeting of the special committee of the New Jersey Automobile and Motor Club, in charge of the plans for the three-day endurance run of May 30-June 1, held last Thursday evening, the route in detail was selected. One of the most important decisions arrived at during the meeting was the matter of controls. If satisfactory arrangements can be made, the noon stop will be made at Washington on the first day, at Trenton on the second day and at Lakewood on the third day. In addition to these, there will probably be an intermediate control on each day, both morning and afternoon.

The cars will leave the clubhouse at Broad and Chestnut streets on the first and second days of the run, and the clubhouse will also be the official finishing point on the first and third days. The route for the run up from Atlantic City to Newark on the third day was shortened somewhat in order that the cars may all arrive at the Broad street clubhouse in time for the reception which is to be tendered the participants in the tour. The route in detail follows:

First day—Newark, Montclair, Caldwell, Pine Brook, Parsippany, Whippany, Morristown, Mendham, Chester, German Valley, Port Colden, Washington (noon control), New Hampton, Junction, Glen Gardner, Clinton, Avondale, Mechanicsville, North Branch, Somerville, Bound Brook, Dunellen, Plainfield, Scotch Plains, Springfield, Hilton, Newark.

Second day—Newark, Elizabeth, Metuchen, New Brunswick, Dayton, Cranberry, Hightstown, Windsor, Edinburgh, Mercerville, Trenton (noon control), Bordentown, Columbus, Mt. Holly, Mechanicsville, Moorestown, Merchantville, Collingwood, Kirkwood, Berlin, Waterford, Hammonton, Elwood, Egg Harbor City, Pamoona, Absecon, Pleasantville, Atlantic City.

Third day—Atlantic City, Pleasantville, Absecon, Oceanville, Smithville, Pt. Republic, New Gretna, Tuckerton, Manahawkin, Barnegat, Waretown, Forked River, Bayville, Toms River, Lakewood (noon control), Lower Squankum, Freehold, Matawan, Old Bridge, New Brunswick, Metuchen, Rahway, Elizabeth, Newark.

Motor Boat Club of America Minstrel Show, April 10.

NEW YORK, March 27.—The minstrel show of the Motor Boat Club of America will be held in Madison Square Garden concert hall, Wednesday evening, April 10. The occasion will be "Ladies' Night" and an enjoyable occasion is looked for. The latter part of April a lecture will be given on the care and handling of motor boats, and in May a lecture on motor boat racing. Tickets for the minstrel show, except for the boxes, are not sold.

Quakeresses Have a Model Automobile Club.

PHILADELPHIA, March 25.—Organized just eleven weeks ago with thirteen members, the Ladies' Quaker City Motor Club already has sixty-five names on its roll, and by the time the charter list closes, on May 1, the Recruiting Committee promises that the one hundredth name will be added to the roll. In its rapid growth the club resembles its namesake—the Quaker City Motor Club—but the two organizations are entirely separate. Many of the members of the new club are wives, sisters or daughters of those composing the older organization—but that ends the relationship.

Application has been made for a charter, Attorney C. W. Talbot, of West Chester, having charge of the matter. The objects of the organization, as stated in the charter, read very much in the order of those which the sterner sex strive for when they form an automobile club—to promote track and road events, to

further sociability, to influence legislation favorable to motorists, etc. The constitution and by-laws are the joint work of the president, Mrs. Joseph J. Martin, and the secretary-treasurer, Mrs. Edward Beecher Finch (the latter president of the Women's Press Club). The other officers are: Mrs. Charles J. Swain, first vice-president, and Mrs. William Noblit, second vice-president. A board of ten directors, of which the officers named are members ex-officio, manage the affairs of the club. In forming the club the original



OFFICERS AND WELL-KNOWN MEMBERS OF THE LADIES' QUAKER CITY MOTOR CLUB.

Mrs. J. J. Martin, president; Mrs. Edward Beecher Finch, secretary-treasurer; Mrs. Chas. Swain, Mrs. William Nobles, vice-presidents; Mrs. Thomas Durham, Mrs. George Muller, Mrs. Aaron Mendenhall, Mrs. John Laird, Mrs. Charles Smirle, Mrs. William Trinkle, Mrs. Percy Chandler, Mrs. Hubert Reading, Mrs. Harry Cook, Mrs. Munyon, Mrs. Robert Pitts, Miss Nilson.

thirteen took no chances, but secured the services of ex-District Attorney Bell to coach them and see that everything was done in legal fashion.

Not to be outdone by mere men, the Quaker City ladies have secured quarters in the Majestic—a suite of three rooms, now nearing completion. The color scheme of the cozy home will be blue and gold—the club colors—and the fittings throughout will completely overshadow those of the home of the Quaker City men in the same building—and this despite the fact that the quarters of the men's club are a marvel of neatness and comfort. The new quarters will be thrown open to the members for the first time on Friday afternoon, April 8, when President Martin will entertain her friends at an informal reception. Later, at a date not yet decided upon, the husbands and fathers and brothers will be entertained. A surprisingly large proportion of the members can handle an automobile, and not a few of them own cars.

President Martin is now engaged in forming her committees, one of the most important of which is that which will prepare a schedule of runs, a gymkhana and other events.

A peculiar feature of the club's affairs which Secretary-Treas-

THE AUTOMOBILE CALENDAR.

AMERICAN.

Shows.

- April 1-6.....—St. Louis, Mo., Automobile Show, Jal Alal Building, St. Louis Automobile Dealers' Association.
- April 6-18.....—Montreal, Canada, Second International Automobile and Sportsman's Exhibition. R. M. Jaffray, manager, 309 W. Notre Dame street.
- April 8-18.....—Pittsburg, Pa., First Annual Show of the Pittsburg Automobile Dealers' Association, Duquesne Garden.
- April 11-13.....—Denver, Col., Automobile Show, Coliseum Hall, G. A. Wahlgreen, manager.

Races, Hill-Climbs, etc.

- April 1.....—St. Louis, Mo., Auto Floral Parade, Automobile Club of St. Louis.
- May 6-7.....—Harrisburg, Pa., Two-day Endurance Run, Motor Club of Harrisburg.
- May 25 or June 1—Philadelphia, Hill Climb, Quaker City Motor Club.
- May 30.....—Chicago, Memorial Day Race Meet of the Chicago Motor Club.
- May 30-June 1..—Newark, N. J., Three-day Endurance Run of the New Jersey Automobile and Motor Club.
- Oct. 19.....—St. Louis, Mo., International Aerial Race of the Gordon Bennett Prize. Aero Club of America.

Motor Boat Races.

- June 3.....—670-Mile Ocean Motor Boat Race, New York to Bermuda. Motor Boat Club of America and Royal Bermuda Yacht Club.
- July 20.....—New York to Marblehead, Mass., 270-mile Motor Boat Race. New Rochelle Yacht Club.
- Sept. 2-6.....—Jamestown (Va.) Exposition, Motor Boat Races.

FOREIGN.

Shows.

- April 6-13.....—London, Agricultural Hall Motor Show.
- May 4-15.....—Madrid, Spain, Automobile Exhibition, Palace of Fine Arts, Royal Automobile Club of Madrid.
- May 15-26.....—Zurich, Third Annual Swiss Automobile Show.
- June 25-30.....—St. Petersburg, Russia, Automobile Show.

Race Meets, Hill Climbs, etc.

- April 1-16.....—Spring Wheel Competition, A. C. of France.
- April 18.....—Paris, La Coupe des Voiturettes, A. C. of France.
- April 21.....—Targa Florio Tour (Sicily), Auto Club of Milan.
- April 25-28.....—Touring Contest, Automobile Club of Touraine.
- April 28.....—Chateau Thierry Hill Climb.
- May 15-31.....—Belgium, Industrial Vehicle Trials, Automobile Club du Nord.
- May 18-21.....—Milan, Italy, Touring Club Trials.
- May 24-27.....—Voiturette Contest, Automobile Club of Austria.
- May 28.....—Isle of Man, Tourist Trophy Race, Automobile Club of Great Britain and Ireland.
- May 30.....—Isle of Man, Heavy Touring Car Race, Automobile Club of Great Britain and Ireland.
- May 22-25.....—Irish Automobile Club Reliability Trials.
- June 3-12.....—Paris, Electric Vehicle Competition, Automobile Club of France.
- June 3-12.....—Herkomer Cup, Automobile Club of Bavaria.
- June 14.....—German Emperor's Cup, Taunus Circuit, Imperial Automobile Club.
- June 20-22.....—American Gold Cup, Start from New York of European Tour for American Cars, Georges Dupuy, secretary, 1402 Broadway, New York City.
- June 14-29.....—Scottish Reliability Trial, Scottish Automobile Club.
- July 2.....—Grand Prix, Automobile Club of France.
- July 14, 1903....—Paris to London, Aerial Race.
- July 15-18.....—Ostend Week, Record Trials, Automobile Club of Belgium.
- July 21.....—Ardennes Circuit (Belgium).
- July 31.....—Liedekerke Cup for Touring Cars, Ardennes Circuit, Belgium.
- July 31-Aug. 3..—Belgium Regularity Contest for Touring Cars, A. C. of Belgium.
- August 1-7.....—Criterion of France, 1,750 Miles Touring Competition and 250-mile race for the Press Cup, A. C. of France.
- August 11-29...—France, Coupe de Auvergne.
- Sept. 1.....—Italy, Brescia Circuit, Florio Cup, A. C. of Italy.

Motor Boat Races.

- April 2-15.....—Monaco Motor Boat Exhibition and Races.
- April 15-30.....—Nice, Motor Boat Races.
- June 15-23.....—Kiel (Germany) Motor Boat Races.

urer Finch commented upon to THE AUTOMOBILE representative was the insistency with which the number "13" projected itself into the club's deliberations. There were 13 at the temporary organization, 26 at the permanent organization, 39 at the fourth meeting, 52 at the meeting on March 13, and 65 on the roll now—all multiples of 13. Nothing daunted, however, the Quakeresses propose to strive onward and upward, leaving superstitious worries to those who can be affected by coincidences of the kind.

New York Motor Club Plans an Elaborate Orphans' Day.

NEW YORK, March 26.—Orphans' Day will again be the leading event on the calendar of early summer outings of the New York Motor Club. This was decided upon at the last meeting of the board of directors, and a committee was appointed consisting of S. A. Miles, chairman; W. J. Morgan and R. G. Howell, with power to select associates, to conduct the run. The date has not yet been selected, but it will probably be the latter part of May or early in June. It is planned to have this year's Orphans' Day eclipse in importance and its benevolent objects the two previous yearly runs conducted by the club, and a concerted effort will be made to provide ample accommodations for the transportation of all the children.

It was definitely decided at the recent directors' meeting that the club should own a home of its own, and steps were taken to secure a site in the vicinity of the Grand Circle at West Fifty-ninth street. Plans were adopted for the financing.

English System for Worcester Hill Climb.

WORCESTER, MASS., March 28.—Worcester will have its third annual automobile hill climb on Dead Horse hill here in May, the date to be announced later. It will be under the auspices of the Worcester Automobile Club, as the others have been. For the first time in America the new English system of handicapping probably will be employed. The system is now being earnestly discussed, and is generally favored by members of the Worcester club. If it is put into operation, it will be the first time a meet in America has been so conducted, and its success or failure will be awaited with interest. By the English system only one event is run, all cars participating by an equitable system of handicapping. By plotting the curves in advance there is little to do except see that the contestants give correct data, figure the elapsed and corrected times, and announce the results.

Chicago Ladies Form a Motor Club.

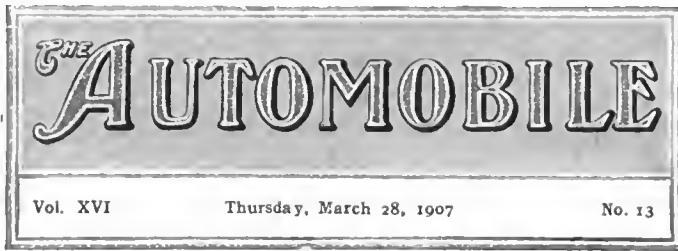
CHICAGO, March 27.—The Windy City has an automobile association in which the mere man plays no part. It bears the title of the Chicago Women's Motor Club, is blessed with all the vigor of youth, and has just held an informal meeting, followed by an adjournment for tea at the Lexington Hotel. The ladies will hold a floral parade in May. The officers are: President, Mrs. C. H. Foster; vice-president, Mrs. A. F. Chase; treasurer, Miss A. M. Andrews; secretary, Mrs. N. J. Boardman.

Quakers Must Change Date of Their Hill Climb.

PHILADELPHIA, March 25.—Continued opposition to permitting the Quaker City Motor Club to run off its hill climb on City Line on Memorial Day has forced the Contest Committee to change the date to May 25 or June 1. An effort will be made to get a permit for either of the Saturdays mentioned, failing which City Line will be abandoned and one of the other courses taken up.

Globe-Girdler Glidden Relates Experiences to Buffalonians.

BUFFALO, N. Y., March 26.—Charles J. Glidden, donor of the Glidden trophy, delivered an interesting address last Friday night to the members of the Automobile Club of Buffalo and their friends. Most of the talk related to sights seen in the Far East and many funny experiences in China and Japan were mentioned. Stereoscopic views were shown by Dr. C. E. Cummings.



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Legislative Mills Are Not So Obnoxiously Busy.

Though the time when every State Legislature does not feel it incumbent upon itself to propagate and attempt to pass a number of bills every year is still far in the distance, signs are not wanting that things are at least tending in that direction. That such a state of affairs must ultimately come to pass, anyone who wishes to look but a decade cannot fail to realize. Long before the bicycle had tumbled from the extreme heights of favor to which it had been boosted, the thousand and one laws and municipal ordinances with which every statute book the country over was loaded had practically passed into oblivion. So far as their actual legal force and effect went, they were as operative as the day they first received the sanction of the all-wise bodies that had formulated them—in reality, the ducking stool and the stocks were not more dead than they.

In the fullness of time much of the legislation that is now thought to be a crying necessity for the proper restriction of the new method of locomotion and its owner will have been relegated to the same category. Laws there will always be, but it will no more be thought necessary to make them more burdensome at every opportunity than is now the case with the bicycle. The automobile is settling down more and more into the daily life of a constantly increasing proportion of the population, and long before it becomes universal, if any institution can ever really be accorded that quality, the necessity for making its possession as onerous a burden as possible will no longer be apparent, even to the Solons who guide our destinies from afar. As to the present signs of encouragement, we may be deceived. It is quite

possible that these same gentlemen may have been so attentive to other and more profitable fields of legislation that for the moment the automobile has been relegated to a second place. It will be there when wanted again. Whatever the cause, there certainly has been a slowing up of the legislative mills all over the country; there has been less legislation and less attempt to make it drastic than ever before. For that much let us be thankful, and at the same time be appreciative of the successful efforts of several State associations of the American Automobile Association in assisting in the general discouragement of too much legislation.



Passing of the Quickly Assembled Car.

There is one thing for which the automobile industry as a whole can never be too thankful for, and that is the fact that it has never experienced an out-and-out boom. One of those huge bubbles of simulated prosperity that swell to immense dimensions in a short time, and, bursting, leave an entire industry prostrate. A combination of circumstances, coupled with the wise foresight of those behind the representative organizations of manufacturers which entered the field so early in the history of the industry, sufficed to prevent any such calamity. To be of any value an automobile must be well built, of good materials—factors that do not lend themselves to the rapid production of cars without a large outlay of capital and a well-perfected organization, backed by brains and executive ability.

Not that this has prevented the attempt—quite the contrary; 1903 witnessed the closest approach to a boom that the industry has ever suffered. Motors were bought in one place, bodies in another, and in this manner the components of a car were collected and put together under conditions and with the aid of facilities about on a par with those at the hand of the average amateur mechanic who has a workshop in his barn. Fortunately the influences referred to were strong enough to successfully combat this flurry, that bade fair to flood the market with worthless junk. Not that it is intended to belittle the assembled car as such. There is probably not a factory to-day on either side of the Atlantic that attempts to turn out the complete automobile. In a few instances in this country every part of the machine and its accessories that can be profitably turned out in one factory are produced, but there must always be many things which the specialist is far better fitted to manufacture. Doubtless there are more assembled cars on the American market to-day than ever there were, but most of them will be made in their own factories within the next two years or less. Many of the best known cars were assembled but a few years ago, but one by one they have achieved homes of their own in the sense that they are now turned out as far as possible by their makers, and it is this constant passing of the assembled car that is one of the best guarantees of the industry's solidity.



The Degree of Bachelor of Automobiling.

Indicating unmistakably the rapid growth of automobiling is the attitude of the leading universities in beginning to give special attention to a subject of widespread interest and the greatest value to the welfare of the country, for it means the solving of quick transportation for the individual in and about cities and towns and even across States and into foreign countries. Add to this the distribution of all kinds of freight and business traffic, and the magnitude of the automobile industry approaches a degree second to none in the development of the republic. There will also be added to the curriculum of the colleges a department on roadmaking and the graduating of experienced roadbuilders, for the improvement of the highways inevitably follows in the wake of the motor-driven vehicle. Even now a Pacific Coast university is to add a course on roadbuilding, providing its State legislators are agreeable, which seems to be assured in advance.

IN NEW YORK'S LEGISLATIVE MILL.

ALBANY, N. Y., March 25.—Assemblyman Young's bill for the insurance of automobiles has been unsatisfactory to the Senators, and they have had it amended and reprinted twice, and it is now on the third reading calendar of the Senate. The new section to be added to the insurance law now allows insurance companies to be formed to issue policies as follows: "Against loss or damage resulting from accidents caused to or by a vehicle, conveyance, or duly licensed automobile, either to the vehicle, conveyance or automobile itself or to any other property." The amendment makes it more than an auto insurance law, and takes in all other vehicles. It is expected to pass the Senate this week, and as amended will have to go to the Assembly for concurrence before it can be sent to the Governor.

The Brough impounding of motor vehicles has been changed by a substitute bill, and the new amendment relative to the giving of security, either cash, guarantee bond, or machine in case of arrest and the addition of an impounding section for the retention of a machine left for bail, is now back in the general laws committee.

MISSOURI BILL AWAITING SIGNATURE.

JEFFERSON CITY, Mo., March 25.—What is known as the House Substitute bill, having been passed by both houses of the State Legislature, is now in the hands of the Governor, awaiting his signature to become a law. Its chief features are the provision of a \$5 registration fee, payable to the Secretary of State, and a speed limit in the open country of fifteen miles. Three-inch numbers and lights are required, besides which the autoist is hedged around with a cordon of regulations regarding coming to a halt and also stopping the motor at the beck of a driver of horses. It was attempted to cut the speed limit down to ten miles, but Senator Peck, the only member of the Senate who owns a car, then proposed that a further amendment permitting automobiles to keep up with funeral processions be added. The speed-reducing amendment was lost by an almost unanimous vote.

TO MEET A FUTURE CRY FOR ROADMAKERS.

SEATTLE, WASH., March 25.—One of the results of the good roads movement in this State is an effort that has just been launched to have appointed to the faculty of the State University an instructor in highway building. The officers of the State Good Roads Association are advocating this very strongly, and urging that a man of national reputation be secured. In a measure the present effort is due to Samuel C. Lancaster, consulting engineer, Department of Public Highways, who has been spending the past few months here, and speaking on the subject of good roads in various sections of the State. He maintains that there is a great future for the expert road builder.

PERTH AMBOY BRIDGE RECONSTRUCTION.

As a result of the closing to traffic of the bridge across the Raritan river between Perth Amboy and South Amboy, N. J., no automobile tour can be scheduled across Staten Island to North Jersey coast points except by the long detour via Metuchen and New Brunswick, thus adding twenty-four miles. All traffic over the bridge will be suspended probably until mid-summer, it being estimated that the replacement of the present span with one satisfactory to the War Department will require that length of time.

C. P. MALCOLM, TWO-CYCLE ADVOCATE, ILL.

C. P. Malcolm, of Detroit, Mich., the well-known advocate of the two-cylinder engine, is reported to be very ill at the present time, and it is probable that nothing more will come from his pen for the next few months. His early recovery is hoped for by the many who have read his articles, even though all do not entirely agree with him.

AUTO ENGINEERS TO HAVE SUMMER MEETING.

The Society of Automobile Engineers will hold a three-day summer meeting at Buffalo on dates to be selected later, but between July 20 and August 10. This was decided upon at a session held Saturday night last in the Flatiron Building, New York City. One of the three days will be devoted to visiting the several large automobile plants in Buffalo. The committee in charge of arrangements consists of T. J. Fay, Henry Hess and H. M. Swetland.

President A. L. Riker announced that the society had been recognized as a permanent engineering society by the American Society of Mechanical Engineers, and therefore there would be an exchange of papers between the two organizations.

A publication committee to take charge of all papers for publication was appointed, consisting of H. F. Donaldson, H. F. Towle and A. L. Clough.

NEW HAVEN'S SUCCESSFUL SHOW.

NEW HAVEN, CONN., March 28.—The automobile exposition held the past week in the Second Regiment Armory has been most successful. It was under the auspices of Troop A, Cavalry, and the management of William E. Dobbins. Crowds thronged the exposition hall the entire week.

Among the automobiles shown were: Franklin, Knox, Babcock, Locomobile, Bailey, White, Autocar, Springfield, Continental, Buick, Thomas, Jackson, Cadillac, Haynes, Rambler, Royal Tourist, Elmore, Logan, Bowers. Also exhibiting: Motorcycle Co., Colonial Rubber Tire Co., Crescent Automobile Supply Co., Sanford Motor Co., New Haven Auto Supply Co., Maley Motorcycle Co.

As an outcome of the show the dealers formed an organization to be known as the New Haven Automobile Association. These officers were elected: President, Cowles Tollman, of the Holcomb Automobile Company; vice-president, W. A. Maynard, of the Thomas agency; secretary and treasurer, Walter A. Crousell, of the New Haven Automobile Corporation.

ONE-THIRD OF A CENT A MILE PER PASSENGER.

From 200 owners of single-cylinder Cadillacs, the Cadillac Motor Car Company announces that it has received affidavits which demonstrate thoroughly that the average cost to them for maintaining their cars has been about \$2.50 per month, the terms of use running all the way from one to four years. This makes the average cost per mile one and one-third cents per car, or an average of only about one-third of a cent per mile per passenger. These average costs are based on the expense of gasoline, oil, repairs, etc., and in some cases including tires. The Cadillac company calls attention to the fact that these 200 owners are scattered all over the United States and not a few isolated cases. In some of its current advertisements in trade papers, including THE AUTOMOBILE, the Cadillac company is calling attention to its interesting series of advertisements.

ROYAL AUTO CLUB TO OCCUPY WAR OFFICE.

LONDON, March 19.—For the second time within five years the Automobile Club of Great Britain and Ireland, now called the Royal Automobile Club by command of King Edward, has been obliged to remove owing to cramped quarters. The clubhouse at 119 Piccadilly will very shortly be vacated in favor of the old War Office building in Pall Mall, until quite recently occupied by the Government.

In a lecture before the recently organized Motor Club of the West Side Y. M. C. A., Monday night, Augustus Post said: "The relation between the automobile and practical flying machines is very close, and it is an interesting fact that several automobile manufacturers are now devoting particular attention to the making of light motors of fairly high horsepower for aerial use."

INDIVIDUALITY IN GRAND PRIX.

There will be more variety of design in the racing machines to compete for the French Grand Prix on July 2 than is usually found in European contests of this nature. French constructors give little intimation of what they will produce for the big event, but from private inquiries it is pretty certain that the machines will be similar in general design to those of last year, with improved and more economic carbureters and more efficient transmission. There will be a greater proportion of shaft-driven machines than ever before. Great Britain, Belgium and the United States depart most widely from the beaten track.

D. M. Weigel, who with Lee Guinness will form the British team in the race, is building a couple of eight-cylinder racers which are bound to attract attention. The cylinders are in one line, the engine being 90 inches from end to end. The accompanying engraving shows Mr. Weigel, who is 69 1-2 inches in height, holding up what is declared to be the longest crankshaft ever made. It is estimated that the Weigel racers will be capable of a speed of ninety miles



D. M. WEIGEL.

an hour. The three Belgian racers entered by the firm of Germain will be lightweights, developing 75 horsepower.

Walter Christie, the sole American representative, displays his individuality by entering the only front-drive machine in the race, and the only one of this type to compete on European soil.

THE VANDERBILT CUP RACE.

According to A. R. Pardington, general manager of the Long Island Motor Parkway, the Vanderbilt Cup race will certainly take place on the eastern section of the parkway, the construction of which will begin first. There will be a straightaway stretch of eight miles or more with wide loops at each end, and the grandstand will probably be located near the easternmost loop. With a road fifty feet wide it will be possible for cars to be driven at the limit of speed in both directions. Probably a whitewashed line will divide the road into two parts. It is expected that the racing section will be ready for use by September 1.

William K. Vanderbilt, Jr., will return from abroad next week, and soon after Chairman Jefferson DeMont Thompson will call a meeting of the A. A. A. Racing Board. Mr. Thompson has recovered from his recent illness.

Two Dragon Cars for Vanderbilt Race.

Announcement is made through John Kane Mills, president of the Dragon Automobile Company, that there will be two 110-horsepower four-cylinder Dragon racers in the American Elimination Trial of the Vanderbilt Cup race. It is further stated that the cars are well under way and will be ready for road trials early in August.

Ernest Kelly May Be a Thomas "Cup" Pilot.

PHILADELPHIA, March 25.—A possible pilot of one of the Thomas cars in the next Vanderbilt Cup elimination race is Ernest R. Kelly, who was little heard of until he landed the Flyer at the top of the non-stop heap with a record of over 21 days' continuous running, but who nevertheless has done much creditable track and road work. Kelly is at present managing the local Thomas agency of Marvin & Hart and is keeping in trim by a little occasional fast work on the suburban roads.

HOTCHKISS AT ROCHESTER BANQUET.

ROCHESTER, N. Y., March 25.—The seventh annual banquet of the Rochester Automobile Club was held to-night at the Genesee Valley Club. Covers were laid for 110 diners. In a decidedly unique manner the repast was served. Cocktails were drunk in oil cans, consomme in Mobiloil cans, while the ice cream was brought to the table in Albany grease cans, regulation size. The menu cards had a front cover showing an automobile speeding along at twilight, with a beautiful cloud effect on the horizon. The picture was framed with automobile tires, and the back cover represented an auto wheel and tire.

President H. S. Woodworth introduced Special County Judge John A. Barhite as toastmaster. The first speaker was William H. Hotchkiss, of Buffalo, president of the American Automobile Association, and he spoke convincingly on the necessity for a national organization. President Hotchkiss took occasion to compliment the Rochester club on its loyal support of the A. A. A. through membership in the State body.

John J. McInerney, George A. Carnahan, J. J. Mandery and J. E. Gleason were other speakers. All of them referred to the coming of a better understanding between the autoists and other users of the road when each respected the rights of the other. Then legislation would become small in quantity.

The club held its annual meeting Monday afternoon. The following officers were elected: President, H. S. Woodworth; vice-president, H. G. Strong; secretary and treasurer, Bert Van Tuyle; attorney, John A. Barhite; consulting engineer, A. J. Rockwood; directors, W. C. Barry, Jr., F. E. Mason, Lee Richmond, Rudolph Schmidt, Griff D. Palmer, J. S. Bingeman, F. H. Bettys, A. F. Crittenden and A. J. Rockwood.

THE COMMITTEES OF THE A. M. C. M. A.

Chairman Benjamin Briscoe of the Committee of Management of the American Motor Car Manufacturers' Association has completed his list of committees for the ensuing year, interest centering upon the Show Committee, which is first given in the list. Following are the complete committees:

Show Committee—H. O. Smith, Premier Motor Manufacturing Company, chairman; William Mitchell Lewis, Mitchell Motor Car Company; J. B. Bartholomew, the Bartholomew Company.

Tours and Races—W. C. Marmon, Nordyke & Marmon Company, chairman; V. A. Longaker, American Motor Car Company; F. M. Keeton, De Luxe Motor Car Company; John Dolson, Dolson Automobile Company; E. K. Conover, Conover Motor Car Company.

Good Roads—Charles Lewis, Jackson Automobile Company, chairman; James Couzens, Ford Motor Company; John Kane Mills, Dragon Automobile Company.

Legislation—R. E. Olds, Reo Motor Company, chairman; Sidney Breese, B. L. M. Motor Car & Equipment Company; George C. John, St. Louis Car Company.

Membership—W. H. Van Dervoort, Moline Automobile Company, chairman; Morris Grabowsky, Rapid Motor Vehicle Company; Jesse French, Jr., St. Louis Motor Car Company.

Advertising and Publicity—Charles E. Duryea, Duryea Power Company, chairman; G. B. Louduback, Buckeye Manufacturing Company; F. M. Keeton, De Luxe Motor Car Company.

Finance—James Couzens, Ford Motor Company, chairman; R. G. Harrison, Harrison Wagon Company; L. C. Boyd, Marlon Motor Car Company.

Standardization and Technical—John D. Maxwell, Maxwell-Briscoe Motor Company, chairman; Charles E. Duryea, Duryea Power Company; Henry Ford, Ford Motor Company; R. B. Crawford, Crawford Automobile Company; L. P. Mooers, St. Louis Motor Car Company; R. E. Olds, Reo Motor Car Company.

Weight and Transportation—W. G. Morley, Aerocar Company, chairman; Harry Knox, Knox Motor Truck Company; S. H. Mora, Mora Motor Car Company.

Tires—William Mitchell Lewis, Mitchell Motor Car Company, chairman; James Couzens, Ford Motor Company; J. B. Bartholomew, The Bartholomew Company.

Agencies—Roger J. Sullivan, Wayne Automobile Company, chairman; W. H. Van Dervoort, Moline Automobile Company; George C. John, St. Louis Car Company.

GROWTH OF A. A. A. IS RAPID.

Directors of the American Automobile Association are very much in evidence in New York City this week. Yesterday at the club rooms of the Automobile Club of America, West Fifty-fourth street, was held a session of the entire Board of Directors, with President William H. Hotchkiss in the chair. Earlier in the day Chairman Charles Thaddeus Terry had a meeting of the Legislative Board at the Manhattan Hotel, and at about the same time Chairman Robert P. Hooper was presiding at a meeting of the Good Roads Board, held at the offices of the Long Island Motor Parkway. Chairman Frank B. Hower, of the Touring Board, made a report at the afternoon meeting of the Board of Directors, when the annual A. A. A. tour came in for much attention.

The Minnesota State Automobile Association and the Connecticut State Automobile Association were admitted to active membership, and it is understood that Michigan, Wisconsin, Missouri, Kentucky, Maryland, and Indiana are nearly ready to apply for affiliation. Secretary Frederick H. Elliott recently made a very successful recruiting tour of the Middle West. The Hotchkiss administration is the most energetic in the history of the A. A. A., and it is expected that before the year is over the national organization will have a membership of over 20,000.

Connecticut State Automobile Association.

HARTFORD, CONN., March 25.—The Connecticut State Automobile Association of the A. A. A., consisting of the Bridgeport, Hartford, and New Britain clubs, has been organized with the following officers: President, Hon. George M. Landers, New Britain; vice-president, F. T. Staples, Bridgeport; secretary and treasurer, G. K. Dustin; attorney, Walter S. Schutz, Hartford.

Minnesota State Automobile Association.

MINNEAPOLIS, MINN., March 25.—These are the officers of the Minnesota State Automobile Association, which has applied for membership in the A. A. A.: President, Frank M. Joyce, Minneapolis; vice-president, George M. Palmer, Mankato; secretary and treasurer, H. S. Johnson, St. Paul. The Minneapolis, St. Paul, Duluth, and Mankato clubs comprise the State body, which has a total membership of nearly a thousand.

Michigan to Have an A. A. A. State Body.

DETROIT, MICH., March 25.—Michigan representation in the American Automobile Association is assured as the result of a visit to this city of Secretary Frederick H. Elliott, of the A. A. A. Mr. Elliott has been on a Western trip in the interests of the association, and made his first stop at Detroit. From here he went to Milwaukee and Minneapolis. Three clubs are necessary for a State organization. It was Secretary Elliott's purpose to interest the Automobile Club of Detroit, as the Grand Rapids and Saginaw clubs already have membership in the A. A. A. While here Mr. Elliott met President E. S. George and Secretary Harry Skilman, of the local organization, Paul Deming, and James H. Flinn. J. J. Jackson was also on hand, while the Saginaw club sent notice of its accord.

As a result of the conference the Detroit Automobile Club met Thursday evening, when it was decided to act on the matter of obtaining A. A. A. membership, preliminary to the move for formation of the State organization. The three clubs already mentioned will form the nucleus, and it is expected that Kalamazoo, Battle Creek, Jackson, and Muskegon will be represented after the move is fairly underway.

Governor Folk, of Missouri, has been requested by a number of good roads advocates of his State to do all in his power to prevent the future use of convicts by labor contractors. The good roads advocates hope that the State Legislature will pass a measure authorizing the employment of convicts in the building of two main State roads.

ANNUAL OF N. Y. STATE ASSN.

The annual meeting of the New York State Automobile Association, held at Auburn, N. Y., Thursday, March 21, resulted in a general demand for the continuance of Oliver A. Quayle, of the Albany Automobile Club, as president of the organization. Mr. Quayle, as chairman of the Legislative Board, has kept a keen eye on the numerous automobile measures introduced in the New York State Legislature, and it appears probable from present indications that the existing law will continue in effect without any changes. H. S. Woodworth, of the Rochester Automobile Club, was also re-elected to the first vice-presidency; N. M. Pierce, of the Binghamton Automobile Club, to the treasurership, and C. D. Hakes was unanimously continued in the secretarial position.



OLIVER A. QUAYLE, President New York State Automobile Association.

The New York State Association has a membership of twenty clubs, including the Cohoes Automobile Club, admitted at the Thursday meeting, and about 3,700 members. Its policy has been to ask nothing unreasonable, and at the same time it has vigorously and successfully contested against oppressive measures.

The Auburn session was attended by the following: President Oliver A. Quayle, Secretary C. D. Hakes, Albany Motor Club; Treasurer N. M. Pierce, Binghamton Automobile Club; S. M. Butler, Emerson Brooks, Automobile Club of America; W. H. Van Auken, Utica Automobile Club; F. B. Hower, A. H. Knoll, D. H. Lewis, Automobile Club of Buffalo; S. C. Tallman, Auto Club of Auburn; A. G. Batchelder, New York Motor Club.

The reports presented showed the State Association to be in a very prosperous condition, with a healthy treasury and a growing membership. Plans were outlined for further increasing the value of the organization to the automobilists of the State.

Following the business session the Automobile Club of Auburn gave a dinner to the directors at the City Club, where the meeting was held. Charles J. Glidden, the "globe-girdler," was the guest of honor, and later in the evening he gave an illustrated lecture for the benefit of the Auburn City Hospital.

THAT OLD LICENSE OF THE SEARCHMONT CO.

The license of the Searchmont Automobile Company, granted by the Association of Licensed Automobile Manufacturers, was canceled in 1904, the Searchmont company having become bankrupt and failing to pay the royalties required by the license. The trustees of the Searchmont Automobile Company, through its attorneys, recently argued in the Supreme Court before Judge Leventritt asking for opportunity of securing from the books of the Licensed Association all data from March 5, 1903, up to the present time, basing its right upon the claim that its ousting was illegal and that it would prove, through access to the desired reports, that several other members of the association had not settled for royalties. The legal department of the A. L. A. M. designates the suit as a "fishing expedition," and assert that back of it is the American Motor Car Manufacturers' Association. The case is scheduled to be tried the first Monday in April.

Charles J. Glidden, the donor of the trophy cup bearing his name, was in Chicago, Wednesday, as the guest of Ferdinand W. Peck. A dinner was given in his honor at the Calumet Club, when prominent Chicago automobilists exchanged ideas.



R. G. KELSEY, IN HIS MATHESON, STARTING THE RUN.

FROM NEW YORK TO BOSTON IN WINTERTIME.

By R. G. KELSEY.

Half-past five on a March morning is, after all, an uninviting time. When we left the New York garage with our ordinary stock Matheson car it was dark and cold and gloomy, but by the time we had drawn up at the place where the starters were waiting for us it was becoming light enough to distinguish the road easily. It was 6:30 o'clock when we officially started out Jerome avenue.

New Rochelle was reached without incident, but near Stamford Station we had a skid which brought us closer to a telegraph pole than was really comfortable. Bridgeport was reached at 8:15 A.M., the 62 miles having been covered at a fraction under thirty miles an hour. It required sixty-five minutes to reach New Haven, 21 miles beyond, and here we got our first taste of the mud and snow which were going to prove such a deterrent.

At New Haven we swung northward and passed Meriden, 20 miles away, in 55 minutes. An hour later saw us in Hartford, and here twenty-five precious minutes were lost in trying to find some one in town who knew whether the east or the west bank of the Connecticut river afforded the better roads. Up the long hill outside the city we plowed, sometimes on first, mostly on second, speed, through mud that averaged more than eight inches in depth; no wet mud, either, but the soft, sticky, hold-fast kind, which the anti-skid chains picked up and threw high in the air behind us. Two hours and twenty-five minutes it took to cover the twenty-seven miles to Springfield. Here another twenty-five minutes was taken for replenishing our gasoline tank, and also filling the cavity in our own systems occasioned by the lack of food from 5 A.M. until nearly 2 P.M.

At 2:10 we left Springfield, being warned that the roads ahead of us were in frightful condition. However, the first fifteen miles to Palmer were very satisfactory, and that town was reached in forty minutes. Here another delay occurred, occasioned by our getting off the road, and after circling around for over half an hour we found ourselves in the same place from which we started.

From Palmer eastward the roads were alternately snowbanks and mudholes, the conditions sometimes varied by occasional stretches of glaring ice, on which the car swung and slewed. Catastrophes, however, were averted and we reached Worcester finally at 5:20. From Worcester into Boston, forty-eight miles, we had hoped for better things, but our hope was doomed to disappointment. The twenty miles which separate Worcester from Marlboro were the worst of our trip, and our time was so slow that we began to wonder if we ever would see the lights of Boston. From Marlboro—which we left at 7:30—into Boston the conditions steadily improved, and when at length we saw the glittering lights on the Capitol as we swung down Commonwealth avenue we felt that we had indeed come to the end of our journey. The city limits were passed at 7:50, and we drew up in front of the Horticultural Hall at 8:15, our total elapsed

time being 14 hours.5 minutes, beating the best previous time made during Boston show week by over five hours.

Outside of our gasoline and oil, the expense of our trip amounted to five cents, with which we purchased some extra belt fasteners—more as a matter of precaution than of necessity. Our total consumption of gasoline for the entire 251 miles which the odometer showed we had covered was 25 1-4 gallons, our oil consumed being 2 gallons.

PLANS FOR THE MICHELIN AMERICAN FACTORY

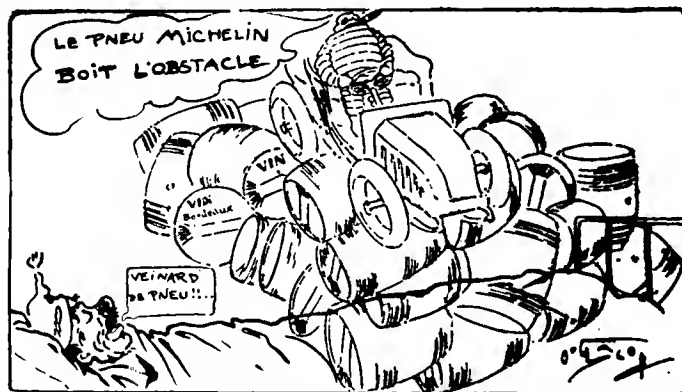
Edouard Michelin, of Paris, who had been in this country for several months past quietly arranging for an American company and factory, has returned to France. It is known that M. Michelin visited several well-known American tire factories and obtained a very comprehensive idea of the tire industry in this country before he completed the plans for an American Michelin plant, which it is understood will be located at Milltown, N. J. M. Michelin gives the following history of the parent company:

"The Michelin factory was erected in 1832 at Clermont Ferrand, France, by the grandfather of André and Edouard Michelin, these two brothers taking over the plant in 1888. In 1891 only fifty-two employes were kept busy, and it was in this year that the Michelin detachable bicycle tire was used by the winner of the first Paris-Brest race. In 1896 the first Michelin automobile tire appeared and now the company employs 4,000 men.

"We are coming to the United States because, notwithstanding the fact that we have to pay an enormous duty, we sell here a large quantity of tires. Our own representatives in this country, E. Lamberjack & Co., last year sold over 16,000 tires and have already contracted for 20,000 tires for this year.

"Some have said that Michelin tires could not be made as well in America as they are in France. I have heard this from several American citizens and confess to have been rather surprised at it. I do not pretend to judge America after the one month I have been here, but I can say, however, that I feel a deep admiration for the United States. I consider that everything here is great and great are the minds of your business men. Everybody seems to go ahead with no fear of danger. Our French and American factories will compete, good-naturedly, and this competition will be very useful to the progress of tires. I am rather at a loss to say which one will overcome the other in popularity, but I think the combination of French ingenuity and American brains will prove a great success."

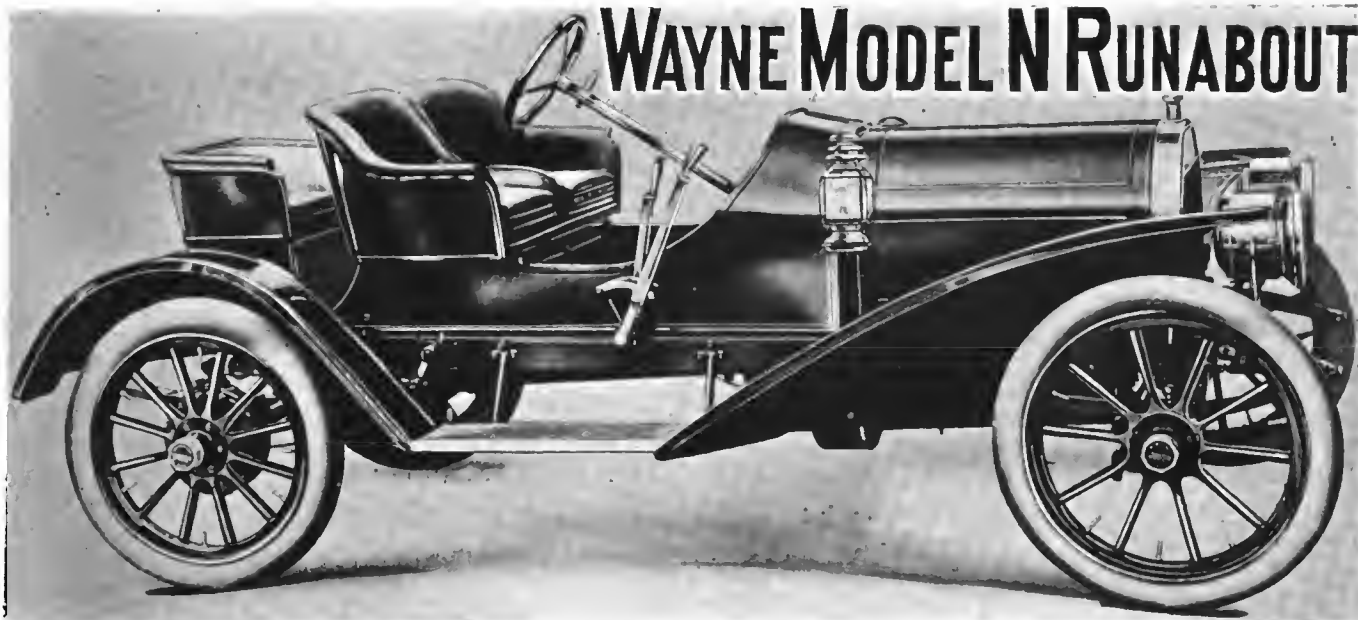
On the Wednesday evening of last week, preceding his sailing the following day on the Touraine, M. Michelin was the guest of honor at a complimentary dinner given to him at the Café des Beaux Arts. Those present included Paul Lacroix, manager of the Renault Frères American branch; George B. Van Cleve, head of the advertising agency of the same name; Leon Rubay, he of the many ignition specialties, and S. H. Stern, American manager of E. Lamberjack & Co.



AN UP-TO-THE-MINUTE MICHELIN POSTER.

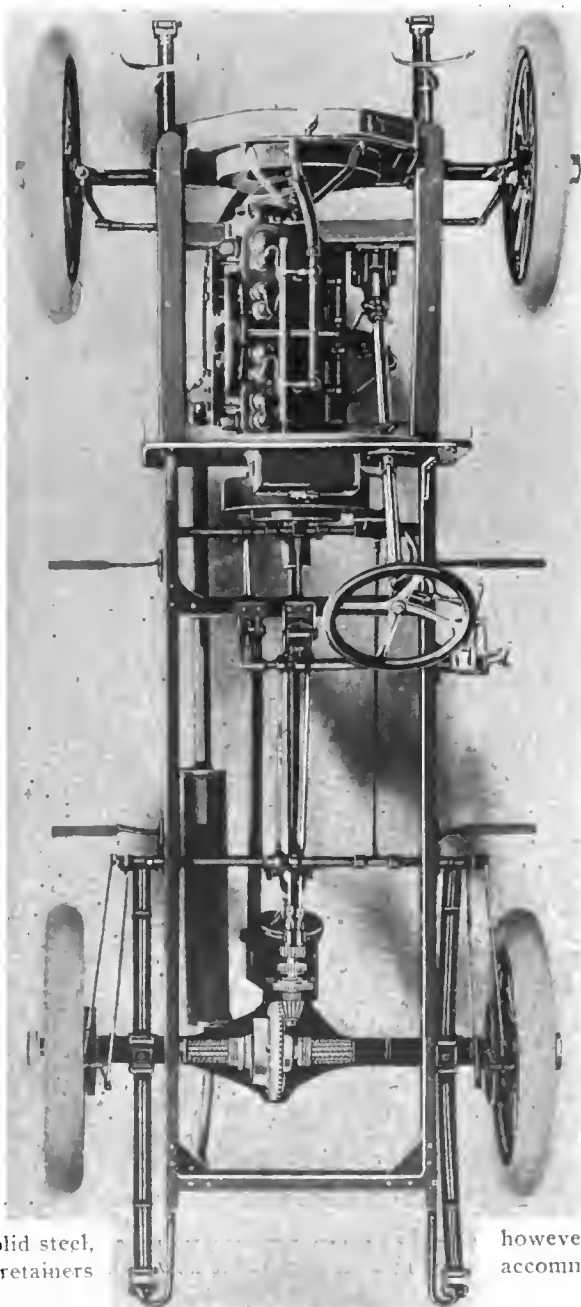
A few years ago Michelin created Bibendum, a giant made of automobile tires, whose quality was that he could drink everything. "Bibendum boit l'obstacle"—"Bibendum drinks up the obstacle"—has become a household phrase in France. The exclamation of the drunkard as in his wild dream he watches Bibendum at work on the wine barrels is "Lucky beggar."

WAYNE MODEL N RUNABOUT



THERE is little doubt that the so-called high-powered runabout is something that is being carried to extremes in a few instances, but the fact that this is the case can do no more to detract from its well-deserved popularity along proper lines than the reckless use of the touring car on the part of a few irresponsible chauffeurs does to the automobile generally. In designing their gentleman's roadster the makers of the Wayne cars have carefully avoided extremes in either direction, and the result is not alone a highly attractive looking car, but one that aptly reflects the purpose for which it is intended. It is equipped with a 30-35-horsepower motor and in general contour follows the lines of the touring Model N, of the same builders, which will be apparent from the photograph of the complete car forming the head of the page.

Stripped of the body, the chassis itself reveals an equally clean-cut appearance, as will be apparent from the accompanying illustration of it. The motor is representative of the most approved trend of current practice in its class. All the valves are placed on the same side and operated from a single camshaft, the valves themselves being made with nickel-steel heads and machine steel stems, electrically welded together, while long flanged wrought-steel guides are pressed into the openings in the base of the valve ports. The wrist pins are one-inch pieces of solid steel, fastening by tilt screws and wire retainers



to the ends of the connecting rods. The latter are of the marine type and are drop forgings of high-grade steel. Throughout the design of the motor the matter of accessibility has been considered paramount, so that every part of it is readily reached for adjustment or repair, without the necessity of tearing down a number of other parts.

The change-speed gear, which is operated by the selective type of gear shifting, provides three speeds forward and reverse and is advantageously located on the rear axle, together with the bevel driving gears and differential, all of which are contained in the same housing. This permits of a style of rear axle construction that lends itself most readily to the requirements of simplicity, coupled with the maximum strength, beside making the gear box accessible to a degree seldom realized where it is placed under the center of the body. Between the clutch and the change-speed gear box there is a shaft slightly over three feet in length, the latter tending materially to reduce the angularity, the entire power plant and transmission mechanism, including the rear axle, being practically in the same horizontal plane under normal conditions, which mean with the customary load, with but a variation of two and one-half degrees as the extreme pitch when the car is empty. The body is of steel and aluminum, and is provided with a third or rumble seat, which, however, is readily detachable to provide accommodation for a trunk, when desired.



H. C. KERR'S ORIENT WINNER IN HONOLULU PARADE.

A HONOLULU FLORAL PARADE CAR.

Given a Honolulu environment, artistic skill and the expenditure of not a little cash, and the metamorphosis of the automobile is an accomplished fact. In this interesting process the auto has an advantage over the horse vehicles, for the latter, however much they may be buried under flowers and foliage, are obliged to retain their quadrupeds to conserve their mobility. The accompanying illustration depicts H. C. Kerr's Orient buckboard in the Honolulu annual floral parade. No mechanical means of propulsion being visible, the graceful bird looked like a thing of life as it quickly skimmed along in the procession of autos.

A DECREASE OF SIXTEEN PER CENT.

(From the European Edition of the "Herald.")

A decrease of 16 per cent., as compared with last year, is noted in the exportation of French automobiles during January.

FREDERICK GLASSUP IMPORTS A BRITANNIA.

The first Britannia automobile to be imported into this country is an 18-24-horsepower four-cylinder touring car and has a number of features worthy of special notice. Among these are: A silent rotary pump of novel design, new automatic carbureter, water piping of extra large size, powerful internal-expansion foot and hand brakes, and circular honeycombed radiator with improved fan. The gear box is of a sliding pattern with three speeds and solid bearings. This car is made by the Britannia Engineering Company, Ltd., of Colchester, Eng., contractors to the British Admiralty, War Office and India Office, and is consigned to Frederick Glassup, the company's sole representative in America.

STATEMENT BY THE JONES SPEEDOMETER.

From the Jones Speedometer, 127 West Thirty-second street, New York City, comes the following communication:

The employees in the toolmaking department of the Jones speedometer factory at New Rochelle, N. Y., went out "on strike" Thursday, March 15. Their places were promptly filled by the Metal Trades Association, of which we are members, and practically all the tools needed for the manufacture of 1907 models have been completed. We desire to inform the public and the trade that there will be no curtailment, interruption, or material delay in our production, and that our customers may positively rely upon the continued prompt shipment of all orders.

THE JONES SPEEDOMETER,
G. L. Holmes, Manager.

TO BE AN A. A. A. TOUR CONTESTANT AGAIN.

E. R. Lozier, who participated in the 1906 A. A. A. tour with a 40-horsepower Lozier, again will be a contestant in the A. A. A. event for the Glidden trophy. Preliminary to the national tour, Mr. Lozier and several of his friends are going to have a run between New York and Cleveland, the best performer to be the winner of a special cup intended to settle several discussions which have arisen during the past winter.



IN THE ASSEMBLING ROOM OF THE E. R. THOMAS DETROIT COMPANY, DETROIT, MICH.—THE ASSEMBLING STANDS WERE DESIGNED BY VICE-PRESIDENT F. E. COFFIN.—FOUR CARS PER DAY IS NOW THE REGULAR OUTPUT

BRIEF ITEMS OF NEWS AND TRADE MISCELLANY

The Reliance motor truck has just been designated as an official baggage truck for the A. A. A. tour for the Glidden and other trophies.

About April 1 the C. G. V. Import Company will remove from their present premises on West Sixty-ninth street to its new showroom at 1849 Broadway

Albert H. Funke, dealer in guns and automobile supplies at 83 Chambers street, New York City, has filed a petition in bankruptcy with liabilities of \$102,338 and assets of \$51,700.

At the Boston show a woman who called at the Corbin exhibit, said: "I want a car that will always have a home; the last car we bought went out of business and consequently had no home, so it was almost impossible to secure any duplicate parts to make repairs, which was a great disadvantage."

C. W. Kelsey, general manager of the newly-formed American Cab and Express Company, which will shortly inaugurate the taximeter cab system in several large cities, has just returned from Chicago, where he has made satisfactory arrangements for the branch of the company in that city. Mr. Kelsey is satisfied that taximeters will be in public demand as much in Chicago as in New York.

Alexander Winton, Geo. H. Brown and Chas. B. Shanks, of the Winton Motor Carriage Company, are members of a syndicate of Cleveland capitalists who have purchased the twin screw steamship *Eastland*, the fastest craft on fresh water, and will put her in daily passenger service between Cleveland, Cedar Point and Toledo. The *Eastland* is 279 feet over all and has a passenger capacity of 3,400.

Owing to its rapidly increasing business, the Darracq Motor Car Company has found it necessary to utilize their entire building at 1989 Broadway, New York City, for showroom purposes and enlargement of office space, necessitating the removal of the repair shop to some other building. A new repair shop has been opened by them, using the entire two-story building at 20 West Sixtieth street for this purpose.

Many American automobile manufacturers are beginning to realize that there is a lucrative field in the export trade. The Maxwell has been successful in creating a foreign demand, and the export business which is in the hands of I. C. Kirkham, of Brooklyn, is rapidly assuming large proportions. In referring to a shipment of 68 Maxwells to the City of Mexico, Mr. Kirkham mentions that all the roads available for automobiling can be traversed in little more than an hour. The question is, "What do they do with the cars?"

Governor Stuart, of Pennsylvania, has attached his signature to the Roberts bill, which, while it attracted little attention, means much to the good roads interests throughout the State and received the quiet support of automobilists. This measure provides that when a township officer refuses or persistently neglects to perform his duties, twenty-five citizens of the township may petition the court for his removal, and if the judge decides that the charges of negligence are

proven, he may, after giving the delinquent a chance to be heard in his own defense, depose him and appoint a successor at once.

NEW AGENCIES ESTABLISHED.

The East Side Auto Station has secured the Pennsylvania gasoline car agency in Providence, R. I.

The Automobile Import Company, 90-96 Stanley street, Montreal, has taken the agency for the Reo for the province of Quebec.

Auto Sales & Livery Company, Providence, R. I., has been appointed Rhode Island agent for the Glide automobiles, with salesrooms at 7 Reservoir avenue.

A branch office has recently been opened by the New York and New Jersey Lubricant Company at 60 Wabash avenue, Chicago. H. C. Watts has been appointed manager.

A new salesroom and garage has been opened by the Jackson Motor Car Company, at 1413 McGee street, Kansas City, Mo., where the interests of Jackson automobiles will be looked after in the Southwest territory.

A. G. Powell, 1519 Spring street, Philadelphia, has acquired the local selling rights for the Chalfont, a 22-25-horsepower, \$1,300 car built at Lenover, Chester County, Pa. An agency for the Holman car, of Chicago, was also established last week by W. S. Williamson at the Crestmont Garage, at Fifteenth and Oxford streets, in the same city.

New agencies established by the Wayne Automobile Co., Detroit, Mich., are as follows: Solliday Motor Car Co., 321 Fourth street, Milwaukee, Wis.; Western Auto Company, Denver, Col.; John S. Watters, 233 Baronne street, New Orleans, La.; M. Francis Kane, 507 Mutual Life Building, Seattle, Wash. The Motor Car Agencies Company has taken over the business of J. W. Leavitt & Company, San Francisco, distributors for the Wayne in Northern California.

A company has been formed by Edw. A. Cassidy, late manager of the publicity department of the American Motor Car Manufacturers' Association, and Jas. G. B. Davy, who has been interested in different lines, both in this country and Europe, to do a general automobile accessory jobbing business throughout the Southern States. This new concern will be known as Cassidy-Davy & Co., and is located in Baltimore. They state that they will carry the largest and most complete stock of automobile accessories south of Philadelphia. Cassidy-Davy & Co. will be the southern sales agents for Ajax tires, Monogram oils and the Leavitt timer and distributor.

PERSONAL TRADE MENTION.

E. M. McIlvain, formerly president of the Bethlehem Steel Company, has been elected president and general manager of the Robins Conveying Belt Company, Park Row Building, New York.

T. F. Byrne, Chicago branch manager for the Franklin, severs his connection there on April 1. He has purchased an interest

in, and becomes manager of the Canadian Automobile Company of Montreal and Quebec, distributors of the Darracq in Canada.

L. A. Harris, for five years in charge of the Elephant Battery & Chemical Company, of London, England, and for the past year their American representative at New York, severed connection with that concern March 7 to engage as salesman with the R. E. Hardy Company.

David W. Henry, general traveling representative of the Electric Vehicle Company, has returned from an extensive cross country trip, the itinerary of which included practically every city of any importance between Hartford and Portland, Ore. Mr. Henry reports business along the west coast as particularly brisk. The San Francisco show, while small, afforded a good example of Western resourcefulness. After a few days in Hartford Mr. Henry will make a tour of Canada, taking in all the principal cities.

RECENT TRADE PUBLICATIONS.

Supplies are described and illustrated in the catalogue of the Brooklyn Motor Car Company of Bedford avenue, Brooklyn. The line includes everything needed by the automobile or the owner of the automobile.

The Bowers carburetor, constructed by the F. E. Bowers Company, New Haven, Conn., is a departure in several respects from the general type of carburetors and one that will give improved results. Its claims are presented in a brochure just issued by the manufacturers.

A descriptive booklet on the Perfection Spring has been issued by the Perfection Spring Company, 2414-2418 Superior avenue, N. W., Cleveland, O. The particular features of these springs and their advantages over other makes are interestingly put forth in the new publication.

A very pleasing hanging calendar has been issued by the Springfield Metal Body Company, of Springfield, Mass. The headpiece represents a smart touring automobile standing by the roadside with a smiling country scene as a background. The calendar is an artistic production.

Catalogue 7 issued by the Brennan Motor Manufacturing Company of Syracuse, N. Y., deals completely with the various types of motors constructed by this firm. Air and water cooled motors, double opposed and four-cylinder engines, gears, electrical parts, motor boats and their equipments are all described.

The Meteor is the title of an automobile built at the Meteor Automobile Works, Bettendorf, Ia. The machine is a 50-horsepower model, for which quite a number of good points are claimed, among them being a very effective transmission. The new catalogue tells all about it in engaging style.

"The Silent Partner" deals a little with the Globe Machine and Stamping Company's products and a lot about other things. The other things are just as interesting as the stampings and they are not lacking in variety or pithiness. The curious would do well to get "The Silent Partner"

for study. The address of the company is Hamilton avenue, Cleveland.

Automobile crank shafts as constructed by the Standard Connecting Rod Company of Beaver Falls, Penn., are described and illustrated in a small booklet issued by that company. Although only a limited portion of the firm's output can be dealt with in the limited space, there are examples of different crank shafts for all types from single cylinder to eight-cylinder engines.

Very complete details of the Stearns automobile are given in the handsome catalogue just issued by the F. B. Stearns Company, Cleveland, O. Mechanical drawings show every part of the mechanism, and the text further helps to give a thorough understanding of the machine. There is a good chapter on suggestions for adjusting and operating Stearns cars. The book should prove particularly useful to owners and operators of this automobile.

Darracq needs no introduction. The machines manufactured at the famous factory on the banks of the Seine at Paris are described and illustrated in the 1907 catalogue just issued by the Darracq Motor Car Company, 1089 Broadway, New York. Details are given of the new six-cylinder 50-horsepower Darracq which makes its bow to the public this year. Various other models of high-power four-cylinder machines as well as a number of elegant closed and runabout bodies are illustrated.

There is a sense of thoroughness and completeness about the automobile course set forth in the booklet issued by the New York School of Automobile Engineers, 146 West Fifty-sixth street. That there is room for a school of this nature is known to all, and the New York school seems to fill the bill. In their booklet full particulars are given

of the different day and evening courses for professional chauffeurs, or would-be professional chauffeurs, and for automobile owners. The home study course, too, is minutely described, and examples given of some of the lesson plates supplied to students. A number of illustrations of the school are included in the publication.

"Crucibles—Their Care and Use," is the title of a handsome little booklet by John A. Walker, general manager of the Joseph Dixon Crucible Company, Jersey City, N. J. The book is intended to instruct users of crucibles as to their proper care. It tells what graphite is and why crucibles are made of it. It tells why crucibles must be made of flake graphite. It tells why some crucibles are dark and others light and the importance of this fact. There is also much valuable allied information on the proportions of metal in commonly used alloys, on freezing, fusing and boiling points of various substances, the specific gravity of various metals and the comparative value of fuels. The double page center of the book carries a most vivid and realistic foundry scene.

MARTINI IMPORT CO. FORMED.

The Martini Import Company has been organized by Percy S. Palmer, formerly senior member of the firm of Palmer & Christie, Jos. E. Freeman and F. D. Palmer, to take over the agency for the Martini cars, which has been held by the firm of Palmer & Christie. With its enlarged capital and ample facilities the new company promise to make this car one of the most prominent foreign cars handled in this country. Mr. Palmer has left for Switzerland, to confer with the Martini Company in regard to receiving a larger allotment of these cars for the United States. The old home of the Martini car at 239 West Fiftieth street will be retained temporarily as a garage and machine

shop until arrangements are made for a larger and more convenient place in a more prominent location. A show room on Broadway will be engaged for temporary use. The officers of the new company are Jos. E. Freeman, president; F. D. Palmer, vice-president; Percy S. Palmer, secretary and treasurer.

STAMPED STEEL AUTO SPECIALTIES.

Added to the numerous stamped steel specialties designed particularly for automobile use, now being marketed by the Dover Stamping Company, 385 Putnam avenue, Cambridge, they are called



ing attention to a new design of oily rag and waste can for garage use, as called for by the requirements of the board of fire underwriters to meet the insurance regulations. Nothing is so liable to spontaneous ignition as a heap of oily waste, so that it is imperative to keep it in a fireproof receptacle. They are made in four sizes and are mounted on steel legs which hold them several inches above the floor. Among the other specialties manufactured by this concern are auto gasoline measures, oil cans, funnels and a full complement of other useful articles of a kindred nature for the use of automobilists.



BUSY SCENE IN THE ASSEMBLING ROOM OF THE FACTORY OF THE DRAGON AUTOMOBILE COMPANY, PHILADELPHIA.

THE AUTOMOBILE



PERCY PIERCE STARTING ON THE 1905 A.A.A. TOUR.

CHAIRMAN F. B. HOWER and his associates on the Executive Committee of the A. A. A. Touring Board have completed a task which has been complicated and difficult and well nigh impossible of accomplishment in such manner as to satisfy all interests involved in the conduct of the annual A. A. A. tour

for the Glidden and perhaps other trophies. Many conferences were held, involving owner and maker, and licensed and unlicensed, and the result should be the running of the largest and most successful semi-endurance tour ever held in this or any other country. All signs point to such an outcome.

July 10 will witness the start of the automobile cavalcade from Cleveland. Westward it will head for Chicago, but the exact route over which it will reach the bustling city on the shores of Lake Michigan is yet to be figured out. In its calculations the committee in charge is giving the most careful consideration to the question of night accommodations, and this may mean the elimination of several cities which would not exactly fit into a schedule calling for an average of about 125 miles a day. This requirement is none too easy over American roads.

In order to give the Westerners an opportunity of lavishing their bounteous hospitality upon the touring army, there will be a stop of a couple of days in Chicago. Then will follow the Eastward run, with its conclusion in New York City on or about July 23. Through peaceful Indiana, across fertile Ohio, a brief look at West Virginia, and then traversing the entire length of rugged Pennsylvania, perhaps dropping down into Washington and Baltimore, the caravan will have arrived in Philadelphia. Whether the Sunday stop will be in Atlantic City and the entry into New York up the Jersey shore is a problem to be taken care of by the sub-committee which shortly will make the preliminary survey. The total mileage will be about 1,400 miles, and will include all sorts and conditions of American roads, long stretches of level country and many miles of mountainous traveling. But the automobile of to-day should meet the test victoriously.

Much favorable comment has resulted from the plan evolved by the committee as to the disposal of the Charles J. Glidden trophy, which this time will go to the club whose entrants proportionately finish with the greatest total of points. Of course, a club to contest for the trophy must supply at least three entrants, but the owner of every car finishing the tour will receive a certificate giving its exact standing, those completing the entire

journey without penalization of any kind to have their certificates marked "Perfect." This will be a harder undertaking than ever before. Those surviving without losing points will earn the honor.

In its compilation of the rules the executive committee took the consensus of opinion as the basis of the conditions decided upon, the leading manufacturers expressing themselves as desiring to enter cars in a contest which would demonstrate the reliability and endurance qualities of their product. True it was that some argued for a pleasure tour pure and simple, and such it may be partially, but in strenuous degree. Nevertheless, provision is made for a division of non-contestants, which is to be a part of the tour and still relieved from the necessity of engaging in the struggle for the Glidden trophy. Those losing their right to contest for the trophy may, after having become disbarred through failure to comply with the rules, in the judgment of the committee, enter the non-contesting ranks for the remainder of the tour.

Replacement of parts not carried this year will be visited with penalties, and there will not be any such latitude as was permitted in the 1906 event. Each entrant will be required to furnish the manufacturer's list of regular standard equipment and price list of all extra parts carried. For any part replaced with parts not regularly furnished as standard equipment by the manufacturer there will be penalizations according to a schedule which would appear to have been carefully thought out. Before starting the entrant will be required to furnish an inventory of all extra parts carried in his car, and this information will be a matter of record. Only the driver and his mechanic will be permitted to participate in making any repairs or replacements. In the matter of tires a car may carry as many as its owner desires. A daily record of new parts placed on a car and any repairs or adjustments made will be required from the entrant. Failure to do so, fully and correctly, will be considered sufficient cause for disqualification.

It will be remembered that last year the fluctuating of watches caused trouble on several occasions. In the imposing of penalties

for reaching controls ahead of or behind schedules an allowance will be made of two minutes for variation in watches. Penalties

desires that particular attention be called to the fact so the committee will have opportunity of giving early attention to the hotel and other similar arrangements and thus insuring an improvement over the general accommodations which brought about so much dissension a year ago.



CHAIRMAN F. B. HOWER, HEAD OF THE A. A. A. TOURING BOARD.

will be effective for each minute or fraction thereof in excess of the aforesaid two minutes.

In the penalty schedule each club of three members starts out with a credit of 1,000 points, and for each additional car points are proportionately added. Penalizations are made on a sliding scale, both in time arrivals and replacement of parts.

An example of parts penalization is given in the rules as follows: "A club of three cars, one of which replaces a spring valued at \$10, will be penalized 3 1-3 points, which is 1-3 of a point for each dollar. A club of ten cars, one of which should do precisely the same thing, will be penalized one point, or 1-10 of a point for each dollar."

An example of time penalization is explained thusly: "A club of four cars, one of which is three minutes late arriving at a control, will be penalized 1-4 of a point for the one minute over and above the two-minute allowance. A club of eight cars, one of which is three minutes late arriving at a control, will be penalized 1-8 of a point for the one minute in excess of the two-minute allowance."

Chairman Hower is particularly urgent for early entrance, and

The executive committee which will have the burden of the tour includes, besides its chairman, L. E. Myers, Chicago; Philip S. Flinn, Pittsburg; James B. Dill, East Orange, N. J., and Dai H. Lewis, secretary. All are experienced and capable men, and have toured thousands of miles under all sorts of conditions of roads and weather.

Judging from the extraordinary amount of interest manifested in the tour, it is anticipated that the entry list may exceed 100, and the entire caravan may embrace some 600 or more people.

During the preparation of the rules for the tour a strong effort was made to have the contest for the Glidden trophy open both to touring cars and touring runabouts; in fact, the N. A. A. M. committee was very much in favor of including the runabouts. Chairman Hower agreed to leave the matter to a decision of the A. A. A. Board of Directors. The subject was discussed at the March 27 session, and, while it was freely admitted that runabouts had made vast strides in popularity during the past year and a large sale was presaged for this season, it was argued and voted that the admission of runabouts might discourage the entering of the big touring cars.

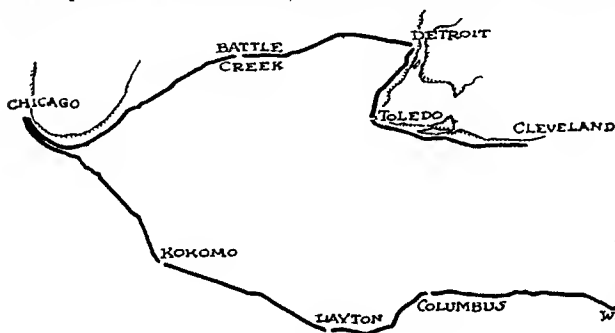
It is likely that the Executive Committee will discuss at its next session the advisability of placing a trophy in competition for the runabout class, especially if early entrants make known their desire to contest for a runabout cup rather than participate with a heavier and more commodious car for the Glidden trophy. It has been stated from various sources that a large number of runabouts will be available if provision is made for this class of car. A score of such entrants seem to be assured.

Percy Pierce, of the Automobile Club of Buffalo, was the winner of the 1905 tour, the first contest for the trophy. A provision in the deed of gift left the trophy in the possession of the winner until it was won by another. The 1906 event resulted in a tied score by thirteen cars, one of which was driven by Percy Pierce, and therefore he retained the trophy. The revised conditions make it impossible for the Bison to make himself a three-time holder, but he can assist his club in keeping the trophy in Buffalo.

RULES GOVERNING THE 1907 A. A. A. TOUR

CONCERNING ENTRANTS.

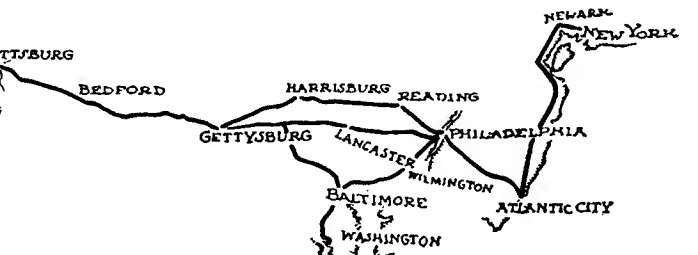
1. It will be assumed that every entrant is acquainted with these rules, and by entering for the tour agrees to abide thereby, agrees to accept the official records, and authorizes the American Auto-



mobile Association shall not be responsible for any damage that may be done to any car, its passengers or contents during the tour, nor for the theft of any car or any of its accessories or contents, the same being at all times subsequent to such entry, and until the close of the tour, at the risk in all respects of persons entering same.

QUALIFICATIONS.

1. Each entrant shall be a member of the American Automobile Association, but if competing for the Glidden Trophy must be a member of a club affiliated with the American Automobile Association, and each club to compete for the trophy must have at least three entries.



2. Teams from clubs joining the Association after April 1 and competing for the Glidden or other trophies must be made up of cars of more than one manufacture.

mobile Association to publish them in such manner as it shall determine.

2. Each entrant shall hold the American Automobile Association harmless and indemnify it against all loss or damage resulting directly or indirectly from or growing out of the operation, management or control of the car entered by him.

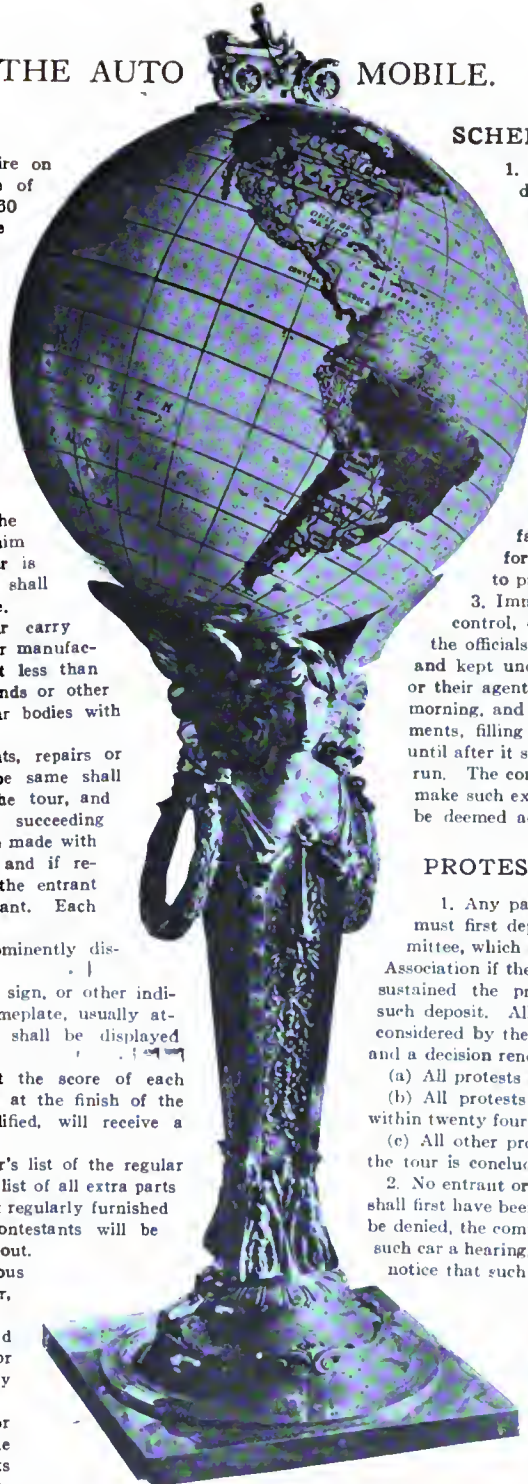
3. It is one of the conditions upon which entries of cars are accepted by the American Automobile Association, that said Ameri-

ENTRIES.

1. The time for receiving entries will expire on July 3, 1907, at 12 o'clock noon, at the office of Frank B. Hower, Chairman Touring Board, 760 Main street, Buffalo, N. Y. Each entry for the 1907 event must be accompanied by the entrance fee—\$100. Numbers for the tour will be issued in the order in which the entries are received.
2. Each entrant shall give all details asked for in the entry blank and such additional information as the committee may from time to time require.
3. The American Automobile Association reserves the right to refuse any entry.

TOURING CONDITIONS.

1. Each car entered shall be driven by the entrant, or a driver or drivers nominated by him and approved by the committee; when the car is driven by other than the entrant, the latter shall ride in the car, unless excused by the committee.
2. Cars must at all times during the tour carry mufflers and mudguards, and be equipped as per manufacturer's catalogue specifications: shall carry not less than four passengers of an average weight of 125 pounds or other equivalent in ballast, and shall have touring car bodies with tonneau.
3. No replacements, replenishments, adjustments, repairs or inspection shall be made upon any car after the same shall have been registered at any night stop of the tour, and before it shall have registered out the next succeeding morning. No replacements (except tires) shall be made with parts not inventoried and carried at the start, and if replacements, except as above specified, are made, the entrant may continue the tour, but not as a contestant. Each entrant may carry as many tires as desired.
4. Each car shall have its official number prominently displayed on each side, or in front and rear.
5. No record of any previous performance, or sign, or other indication of the maker's name, other than the nameplate, usually attached to the vehicle as sold to private owners, shall be displayed on any car at any time during the tour.
6. The trophy will be awarded to a club, but the score of each individual car will be recorded during the tour, and at the finish of the contest each entrant, unless previously disqualified, will receive a certificate in accordance therewith.
7. Each entrant must furnish the manufacturer's list of the regular standard equipment and the manufacturer's price list of all extra parts carried, and for any parts replaced with parts not regularly furnished as standard equipment by the manufacturer, contestants will be penalized as per penalty schedule hereinbelow set out.
8. Each entrant must furnish an inventory, previous to the start, of all extra parts carried in his car, and the same shall be put in the records.
9. A car may carry but one mechanic, and all repairs must be made by him, the operator, or both, and no one else shall participate in any way in making any repairs or replacements.
10. A statement must be made by the operator and attested by each occupant of the car at the conclusion of each day's run, as to what new parts were put on the car and what repairs or adjustments, if any, were made, and failure to do so, fully and correctly, shall disqualify.



SCHEDULES.

1. The committee will publish a schedule for each day, establishing such checking points as it may deem proper. This schedule will fix the exact time when each car must reach each control, and when it shall finish each day's run, but will not require any entrant to operate his car at a higher rate of speed than is permitted by law. Each car failing to reach controls, or to finish the day's run at the time fixed by the schedule, will be penalized according to the penalty schedule herein given. The committee shall have power to disqualify any car for traveling at any speed which the committee may consider excessive under the conditions existing at the time, and without reference to these rules.
2. On arrival at night controls, each car must take its place in line and register in regular order. Cars failing to do so, will be disqualified. Contestants for the Glidden Trophy shall, however, be entitled to precedence in registration over non-contestants.
3. Immediately following the registration at each night control, each car shall be delivered into the custody of the officials of the tour, to be by them held at owner's risk, and kept under direct charge and supervision of such officials or their agents until the hour for starting on the following morning, and no car shall be available for tuning up, adjustments, filling with gasoline or water, or for any other purpose, until after it shall have registered as starting on the next day's run. The committee shall have power, etc., at all times to make such examinations of the cars and their contents as may be deemed advisable.

PROTESTS. DISQUALIFICATION.

1. Any participant in the tour desiring to file a protest must first deposit the sum of \$10 with a member of the committee, which sum will be retained by the American Automobile Association if the protest is not sustained, and if the protest is sustained the protest fee will be returned to the person making such deposit. All protests must be made in writing, and will be considered by the committee at the earliest practicable moment, and a decision rendered as soon as practicable thereafter.
 - (a) All protests as to entries must be made before the start.
 - (b) All protests as to unfair ruling, route, etc., must be made within twenty four hours after the occurrence.
 - (c) All other protests shall be made during or immediately after the tour is concluded, and before the award is made.
2. No entrant or car will be disqualified until the person in charge shall first have been notified of the act complained of, and if the act be denied, the committee will give the owner or person in charge of such car a hearing, after which a decision will be rendered. Upon notice that such car has been disqualified, it shall cease to run in the contest, the official numbers shall be removed, and such entry shall not receive any certificate, but shall be mentioned in the records as having been disqualified, and no entrant of any car that may be disqualified shall have any claim of any kind or nature whatsoever against the American Automobile Association, or any member or members of the committee or any official of the tour, because of such disqualification or the publication thereof or failure to mention the performance of the disqualified car prior to its disqualification.

failure to mention the performance of the disqualified car prior to its disqualification.

SPECIAL TRIALS OR TESTS.

1. In the event of a tie at the end of the tour, the committee may require such other and further trials or tests as it may deem necessary or advisable to establish the awarding of the trophy.

PENALTY SCHEDULE.

The Glidden Trophy will be awarded to the club having the greatest number of points at the end of the contest. The method of scoring will be as follows:

Club of	Initial credit	Penalizations per minute or fraction thereof in excess of two minutes at controls.	Penalizations per dollar or fraction thereof of value of parts as per manufacturer's price list.
2 cars	1,000	1-3 point	1-3 point
4 "	1,010	1-4 "	1-4 "
5 "	1,030	1-5 "	1-5 "
6 "	1,060	1-6 "	1-6 "
7 "	1,100	1-7 "	1-7 "
8 "	1,150	1-8 "	1-8 "
9 "	1,210	1-9 "	1-9 "
10 "	1,280	1-10 "	1-10 "

ROAD REGULATIONS.

1. Entrants must conform to all laws and ordinances and rules of the road, and any entrant violating any of the provisions of these rules, or of other rules adopted by the committee, or who shall fail to show due consideration to other participants in the tour, or other users of the highways, may be disqualified by the committee.
2. Any car whose owner or driver shall be arrested for a violation of speed laws, or of any law or ordinance, may, in the discretion of the committee, be disqualified.

CONTROLS.

1. All contestants must have their cars ready at 7 o'clock each morning. Checkers will be at their stations at that time prepared to start the cars.
2. Each entrant must, upon starting on each day's run, sign a statement submitted by an official of the tour fixing the time of his departure. Failure to comply will result in disqualification. Each day's tour shall be preceded by a pacemaker, designated by the committee, and any entrant who passes the pacemaker shall be disqualified. If the pacemaker breaks down or is compelled to travel at a rate of speed so slow as in the opinion of the committee to unduly impede the progress of the tour, his flag shall be transferred to the first car overtaking him, which car shall thereafter become pacemaker, subject to the same conditions.

Penalties will be imposed for reaching controls ahead of, or behind schedules. Two minutes will be allowed for variation in time pieces. Penalties will be effective for each minute or fraction thereof in excess of aforesaid two minutes.

EXAMPLE. PARTS PENALIZATION.

A club of three cars, one of which replaces a spring valued at \$10, will be penalized 3-3 points, which is 1-3 of a point for each dollar. A club of ten cars, one of which should do precisely the same thing, will be penalized one point, or 1-10 of a point for each dollar.

EXAMPLE. TIME PENALIZATION.

A club of four cars, one of which is three minutes late arriving at a control will be penalized 1-4 of a point for the one minute over and above the two-minute allowance. A club of eight cars, one of which is three minutes late arriving at a control, will be penalized 1-8 of a point for the one minute in excess of the two-minute allowance.

NON-CONTESTANTS OF THE TOUR.

1. In order to provide for those who desire to participate in the

annual A. A. A. Tour, and do not care to contest for the Glidden or other trophies, a separate class of "Non-Contestants" is created, and those coming under this head will not be subject to Articles 2, 3, 6, 7, 8, 9, 10 of "Touring Conditions"; Articles 1 and 2 of "Controls"; Articles 1, 2, 3 of "Schedules"; and Article 1 of "Special Trials or Tests."

HOW DISQUALIFIED CARS MAY CONTINUE.

1. Contestants for the Glidden Trophy failing to comply with the rules governing same, and thereby losing their status as contestants, may, in the discretion of the committee, continue on the tour as "Non-Contestants."

POWERS OF COMMITTEE.

1. In the event of a dispute concerning the interpretation of the rules, the decision of the Executive Committee of the Touring Board of the American Automobile Association shall be final.

2. The Executive Committee of the Touring Board reserves the right to alter or amend, suspend, or repeal these rules from time to time, up to and including the end of the tour and final award, as may in its judgment be deemed expedient.

PROGRESSIVE A. A. A. ACTIVITY BRINGING RESULTS

THAT the Hotchkiss administration of A. A. A. affairs is certain of doing much was apparent at the spring meeting of the Board of Directors, held in New York City, March 27, at the clubhouse of the Automobile Club of America. Two State associations were added to the membership list, Connecticut and Minnesota becoming part of the national organization. Applications from Rhode Island, Maryland, Indiana, Michigan, Wisconsin, Kentucky, Missouri and Iowa are expected soon.

Recognizing that racing results in some benefits of a substantial nature to the industry, the directors sanctioned a suggestion from a coterie of well known makers that a contest for American touring cars be conducted soon after the annual Vanderbilt Cup race in October next. The event would be limited to regular stock touring cars, except that the chasses would be mounted with racing instead of touring bodies. The subject was referred to the Racing Board with power to arrange such a contest.

It was decided to designate the second Wednesday of June in each year as a National Orphan's Day, A. A. A. clubs being asked to hold their affairs of this character this year on Wednesday, June 12, if local conditions permit.

President Hotchkiss recommended the formation of two new boards one to be known as the Technical Board and the other the Publication Board. The duties of the Technical Board, made up of automobilists without trade affiliations, would be to conduct such tests as might be suggested to determine the worth of automobiles in general and their different parts and appliances. The work of the Publication Board would be the preparation of a year book, digests of State laws, maps and route cards, and possibly a monthly bulletin. The establishment of two such boards was referred to the Executive Committee.

Exhaustive reports were presented by Chairman Terry of the Legislative Board, who had prepared the draft of a model State law; Chairman Hooper of the Good Roads Board, who recommended that State committees of his board be formed in States where there were no State bodies; and Chairman Hower of the Touring Board, who gave the conditions for the annual tour.

The roll call showed the following directors present:

President, William H. Hotchkiss, Automobile Club of Buffalo.
 First Vice-president, Lewis R. Speare, Bay State Automobile Assn.
 Charles Thaddeus Terry, chairman Legislative Board.
 Frank B. Hower, chairman Touring Board.
 Robert P. Hooper, chairman Good Roads Board.
 Secretary, Frederick H. Elliott, Automobile Club of Syracuse.
 Osborne I. Yellott, Automobile Club of Maryland.
 Sidney S. Gorham, Chicago Automobile Club.
 J. H. Morse, Automobile Club of Hartford.
 Walter E. Edge, Atlantic City Automobile Club.
 John P. Coghlin, Worcester Automobile Club.
 A. R. Pardington, Brooklyn, N. Y.
 A. G. Batchelder, New York Motor Club.

George A. Post, North Jersey Automobile Club.
 J. H. Edwards, Automobile Club of Hudson County (N. J.).
 W. H. Chase, Wauchussetts Automobile Club (Mass.).
 Walter C. White, Cleveland Automobile Club.
 George H. Smith, Quaker City Motor Club (Penn.).

Earlier in the day and preceding the meeting of the Board of Directors, there were sessions of the Legislative and Good Roads Boards, considerable work being outlined for the near future. There was no meeting of the Racing Board, owing to the indisposition of Chairman Jefferson De Mont Thompson.

HOTCHKISS ADDRESSES OHIO STATE BODY.

CLEVELAND, April 1.—At the annual meeting of the Ohio State Automobile Association, held Saturday at the clubrooms of the Cleveland Automobile Club, five clubs were represented: Cleveland, Cincinnati, Springfield, Lima, and Elyria. President F. T. Sholes presided and presented a very satisfactory report.

President W. H. Hotchkiss, of the A. A. A., made an enthusiastic address wherein he dwelt upon the necessity for a national organization, particularly calling attention to the need of a Federal law which will permit an automobilist to go anywhere in the country after having complied with the registration law of his own State.

In the evening the Cleveland club gave a smoker to its members and guests, it being the largest gathering of automobilists ever gotten together in Cleveland. President Hotchkiss delivered another address in which he emphatically condemned careless drivers. He referred to the liberality of the speed laws in Vermont, where the autoist's judgment is taken into consideration, and stated that efforts would be made to enact similar laws in every State and to induce Congress to act upon the matter.

ABOUT THE STATEN ISLANDERS OF NEW YORK

ST. GEORGE, S. I., April 1.—At its meeting to-night the Richmond County Automobile Club decided to hold another dinner and run on April 28, and the new Terra-Marine Inn at Huguenot was selected as the destination. The entertainment committee, consisting of Emil H. Poehn, chairman; W. O. Sprigg, G. H. Waters, Charles A. Schultz, and J. J. Worrell, was requested to proceed with the necessary arrangements. At this meeting George H. Waters was elected a director to the New York State Automobile Association. A resolution was passed favoring federal and uniform automobile legislation which shall grant a national license to tourists and remedy some of the existing evils resulting from State legislation. A. B. Pouch and John Bittner were elected to membership.

AIR TOURISTS CONTINUE THEIR SPRING FLIGHTS

PARIS, March 27.—The return of Spring has brought the cloud brigade out of doors. Delagrange, Blériot, Vuia, and Santos-Dumont have all made experiments with their respective machines in the neighborhood of Paris. M. Blériot, of automobile lamp fame, has been busy all the winter on a new type of aeroplane, differing entirely from the one he used on the Lac d'Enghien last summer. It has a central frame on which is carried a 24-horsepower Antoinette motor driving a two-blade propeller in the rear and two wings modeled like those of a bird. The light framework is covered with parchment and is designed to offer very little resistance to the wind. The machine abounds in novel features thus, the two wings can be raised or lowered at will to facilitate turning, the two rudders placed in front may be operated either together or separately, and the two blades of the propeller can be driven either as one or independently at different speeds. The machine is mounted on a couple of bicycle wheels with efficient steel springs and a pneumatic cushion to prevent breakage when striking the ground.

Santos-Dumont escaped without injury. He declares that he is not sorry the machine is smashed, for he was disappointed with the quality of the wood, which was much too brittle. Fresh material has been ordered and a new machine will be commenced to be fitted with the 100-horsepower, sixteen-cylinder motor now being built at the Antoinette factory.

French Gordon-Bennett Balloon Pilots Chosen.

Alfred Leblanc and René Gasnier have been appointed by the Aero Club of France as the national representatives in the Gordon-Bennett balloon race at St. Louis, next October. The third pilot will probably be selected towards the end of May. A delegate will be sent from the Aero Club of France to assist in the organization of the balloon race at St. Louis and the club has promised a gold medal to the pilot who succeeds in capturing the Bennett Cup for France. Alfred Leblanc is thirty-eight years of age, is a skilled hunter, skater and automobilist. He has made more than fifty balloon ascents in his balloons, the



THE NEW BLÉRIOT AÉROPLANE LEARNING TO USE ITS WINGS ON THE BAGATELLE POLO GROUND, PARIS.

Unfortunately the initial trip was not a complete success. While traveling at a rapid rate the wheel supports broke and the apparatus collapsed. No serious damage was done.

M. Vuia, who has the honor of being the second man in France to fly on a heavier-than-air machine, has decided after several trial trips this week to abandon the carbonic acid motor in favor of an Antoinette of 24-horsepower.

After two or three unfortunate attempts to fly, M. Delagrange has met with success. The aeroplane built for him by the Voisin Frères has just covered a distance of about sixty yards in excellent style. Though still showing signs of too light construction, the aeroplane has proved that it is built on right lines. Santos-Dumont, who was present when the flight took place, heartily congratulated his rivals.

Santos-Dumont's Aeroplane Is Wrecked.

According to a *Herald* cable from Paris, Santos-Dumont completely smashed his machine in an attempted flight on the Saint-Cyr drill ground. For several days trials had been made to familiarize the pilot with the *Bird of Prey*, and finally an attempt was made to travel at the forty miles an hour necessary to raise the aeroplane from the ground. After covering half the length of the ground the machine swerved, bounced into a hole and was smashed in two. One of the wings was hopelessly destroyed.

Albatross and the *Cythère*, and gained second prize in the Grand Prix of the Aero Club of France in 1906. He is also holder of the Gaulois long-distance trophy for a voyage from Paris to the Baltic. René Gasnier is an enthusiastic yachtsman, thirty-three years of age, who has sailed extensively in Eastern waters. He made his first balloon ascent in 1904 and is now the owner of three balloons.

WALTER WELLMAN'S VISIT TO THIS COUNTRY.

PARIS, March 27.—The members of the Wellman north pole expedition are completing the preparation of the balloon *America*, and will leave here shortly for Tromsø, Norway, whence they will depart for Spitzbergen June 1. The balloon, or airship, has been entirely reconstructed, has new motors, and possesses a lifting power of 19,500 pounds.

Walter Wellman, leader of the expedition, will in the meantime pay a visit to the United States. He is on board the *Kaiser Wilhelm II.*, which is due in New York on April 3. Replying to criticism to the effect that his airship had not been tried, Mr. Wellman declared that the *America* was built for arctic conditions and would undergo thorough trials at Spitzbergen. In the event of these being satisfactory the expedition would start for the pole at the end of July or the beginning of August.

JAMESTOWN AERONAUTICAL CONGRESS:

The Jamestown Exposition is having erected a special building to house the aeronautical exhibits. There will be balloon sheds and a hydrogen generating plant located conveniently in the aeronautic concourse. Coal and hydrogen gas will be supplied without cost to all contestants. A large number of applicants have already signified their intention of exhibiting aeronautic material of both heavier and lighter-than-air types. There will be cups and trophies for balloon and airship races and all sorts of competition. To Ernest La Rue Jones, No. 12 East Forty-second street, New York City, all inquiries should be addressed.

The following is the schedule of competitions between April 26 and November 30:

- No. 1.—Special race limited to members representing recognized aero clubs for club championship, May 4.
- No. 2.—Dirigible balloon competition, June 1.
- No. 3.—Competition of balloons for distance, June 15.
- No. 4.—Competition of balloons for duration, Aug. 3.
- No. 5.—Competition of balloons for objective point, Sept. 7.
- No. 6.—Competition of balloons for altitude, Nov. 16.
- No. 7.—Competition of balloons in pursuit of pilot balloon, Aug. 17.
- No. 8.—Competition of carrier pigeons, flight from Aeronautical Concourse, Exposition Grounds, May 18.
- No. 9.—Simultaneous release of large number of small balloons carrying messages, May 18.
- No. 10.—Flying devices heavier than air, with motor and operator, Sept. 14.
- No. 11.—Flying machine models with motor, Aug. 24.
- No. 12.—Flying machine models without motor, and carrying operator, Sept. 14.
- No. 13.—Kites for altitudes, Nov. 2.
- No. 14.—Kites for steepest angle of flight, No. 9.
- No. 15.—Kites carrying operators, Nov. 16.
- No. 16.—Registering balloons, July 13.
- No. 17.—Competition of balloons and automobiles. (Date to be coincident with the arrival of the Automobile Tour.)
- No. 18.—Competition of dirigible balloons and automobiles, May 25.
- No. 19.—Competitions of photographs taken from balloons or kites.
- No. 20.—Competition of photographs taken of balloons, aeroplanes or other aeronautical objects.
- No. 21.—Competition of photographs of meteorological phenomena. (Exhibits for No. 19, 20 and 21 to be ready April 26, and continuing on exhibition throughout the Exposition.)
- No. 22.—Signalling competitions with balloons or kites, Oct. 12.
- No. 23.—Hot air balloon competition, Oct. 5.
- No. 24.—Dropping (harmless) shells nearest selected objective point or target.
- No. 25.—Competition for longest trip, open during Exposition.

SWITZERLAND'S BALLOON RACE ENTRANT.

A communication has been received by the Aero Club of America from E. Messner, of Kewanee, Ill., applying to enter the Gordon Bennett International Aeronautic Cup Race. He is a pilot of the Aero Club Suisse and is writing to his club for permission to represent them in this race. The Swiss Club will, in turn, apply to the Federation for permission to enter. The entries having officially closed February 1, it would appear certain that the entry will not be accepted.

ELECTION OF THE FLORIDA EAST COAST A. A.

DAYTONA, FLA., April 1.—The annual meeting of the Florida East Coast Automobile Association, held recently, resulted in the selection of the following officers for the ensuing year: President, Major Foster; first vice-president, George Sebring; second vice-president, S. H. Gove; treasurer, Fred Conrad; secretary, T. Edward Fitzgerald; directors, Asa Paine, J. H. Allen, George H. Clark, J. B. Parkinson, E. L. Potter, N. A. Lewis.

Following the election a banquet supper was tendered by C. G. Burgoyne, the first president of the association, and he pleasingly presided as the toastmaster of the occasion. The speechmakers included: W. J. Morgan, President-elect Foster, ex-President Paine, ex-Gov. Harding, of Ohio; Hon. J. B. Parkinson, Com. J. H. Allen, John Anderson, Mayor Green, Dr. Bennett, and several others.

AUTOS DRIVE PARIS NEWS PLANTS.

PARIS, March 20.—A prolonged wail of despair wafted heavenward—or elsewhere—when at 5 o'clock on Friday evening the electric lights of Paris went out as a result of the strike of the electricians. Householders shrugged their shoulders and thanked their stars that Paris apartments are still provided with gas or kerosene lamps. Theater managers closed their establishments and were philosophical. Newspaper men cursed loud and deep.

The first panic over, there was a rush for automobiles. Many an excited manager jumped into one of the numerous automobile cabs skimming along the boulevards and cried in feverish tones, "Panhard, Darracq, De Dion factory, and let her out as if the diable were on your heels." But the automobile factories which encircle Paris were closed for the night and gasoline-electric groups were at a premium. Commandant Krebs was closing his desk at the Panhard factory when a husky voice over the telephone asked if he could not send a portable plant to help the auto journal *Les Sports* out of its difficulty. Two gasoline-electric groups, each of 100 horsepower, were supplied, electric arc lamps similar to those used on the cycle tracks were obtained and one newspaper at least was saved from ruin. *L'Auto* had an Aster electric group in reserve which proved quite capable of running the line-



DE DION AUTO PRODUCING PARIS NEWSPAPER.

types. In the newspaper quarter steam locomobiles puffed away all night side by side with gasoline delivery trucks and a smaller number of touring cars, all doing their best to furnish the electricity which the workmen denied. In one print-shop a 12-horsepower Darracq was raised off the floor, a rear wheel replaced by a driving pulley and belted onto the shaft of a linotype installation. Léon Bailby, who presides over the editorial destinies of the *Intransigeant*, brought along his De Dion automobile, ordered a dynamo, fixed the two in the street, belted them up and produced enough current to give the latest news to the public. The director of *Paris-Sport* owns a new 24-horsepower Hotchkiss which he used to drive a dynamo, smashing the body work to get the connection between the engine and dynamo with the recklessness of despair. Henry Fournier, who is now passing his time profitably selling automobiles to American and other millionaires in Paris, dismounted a magnificent 130-horsepower Itala motor intended for the Monaco motor boat meet, and gave it up to drive a dynamo.

In the Rue Royale, and on the main boulevards, the fashionable cafés were lighted with automobile searchlights, lanterns and candles. The costly headgear of a pretty Parisienne catches fire; the crowd laughs. Fournier passes too near the open exhaust of one of his big Itala engines and his silk hat is left behind for the ragpicker. Bravo, cry the ladies. The strike is fine fun for the boulevardiers, but newspaper proprietors are giving orders for gasoline-electric groups to be kept in reserve.

WHAT AUTO INVENTORS ARE DOING ABROAD

It seems so long since the type of car that banged its way along with an unduly audible announcement of its coming was prevalent that the average autoist has forgotten the time when mufflers were such in name only, and the volume of sound did not vary greatly whether the alleged silencer was open or shut. In the same period, the motorcycle has not been improved

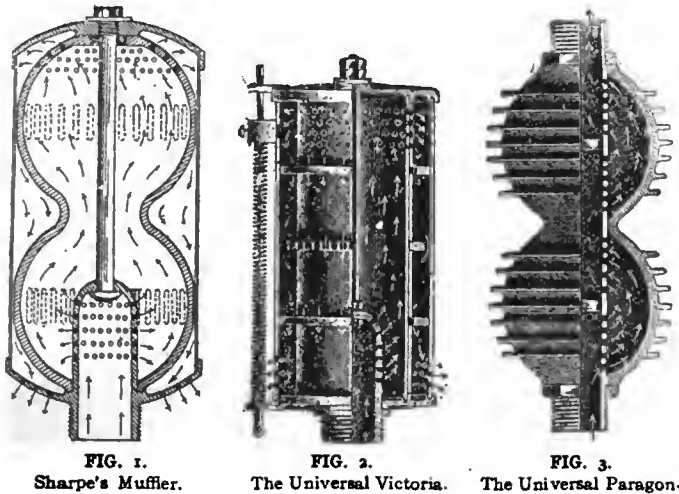
place shown in the sectional drawing, and a small by-pass allows the pressure to become equal on either side of the cylinder so that no action takes place.

Hydraulics Applied to Change-Speed Gear.

Although the application of hydraulics to the car is nothing entirely novel, as considerable attention has been paid to the matter of perfecting a hydraulic type of clutch, the latter power has not so far as known ever been utilized in the same manner as it is employed in the White patent speed gear, shown at the recent commercial vehicle exhibition in Olympia and described in *Motor* (London). It is designed along planetary lines and consists of a sunwheel carried on the tailshaft and planetary pinions supported by bearings in two plates bolted together on either side of the sunwheel, and fixed to the engine shaft. Outside one of these disks (on the engine side) there are small cranks attached firmly to the spindles of the planetary pinions, and used to drive the plungers of small oil pumps arranged symmetrically round the disk. Oil is sucked in through ball valves in the head of the barrels, and expelled through ports, the size of which can be controlled by an outside lever. According to the freedom allowed for the oil circulation, the speed of the tailshaft is regulated. When the engine is running, and the car not in motion, the oil pumps are permitted to work freely, and the planetary pinions revolve round the sunwheel without turning it. Directly the oil-outlet ports are partially closed the sunwheel commences to revolve at a slow speed, and the tailshaft obtains power to drive the car. The speed of rotation of the sunwheel increases as the pumps work more and more slowly, until, when these stop altogether, there is a solid drive right through. For the reverse a separate train of wheels is provided. There are certain disadvantages in the system. At slow speeds the power lost in friction forms a large proportion of the power developed, but as it is possible to run very largely on the direct drive the total loss will never amount to much, while it has the great advantage that the higher the speed the more efficient it becomes. A gear of this nature, flexible in the extreme, is a thing to be desired.

A New Self-Contained Distance Recorder.

Quite a departure in the shape of distance recording instruments is to be found in an English device which has been given



perceptibly in this respect, and this constitutes one of the greatest drawbacks of the light power-driven two-wheeler from the public point of view. The layman cannot understand why the diminutive machine makes a fuss so disproportionate to its size and so much greater than that of its larger competitors. The Auto Cycle Club of Great Britain recently instituted a contest for improved devices of this kind, the awards in which have recently been made public. The chief considerations were back pressure, noise, facility of attachment, weight and strength, capacity, means of cleaning and maintenance, and cost. As will be noted from the illustrations, taken from *The Motorcycle*, the devices which gained the first three awards are distinguished by their simplicity. The first, shown by Fig. 1, is known as Sharpe's Universal Silencer; the second, Fig. 2, is the Universal Victoria Silencer, and the third, Fig. 3, is the Universal Paragon Silencer. The Sharpe is made of a seamless brass shell with two smooth aluminum bulbs; the Victoria consists of but two aluminum bulbs cast with flanges, while the Paragon consists of two annular concentric chambers and a series of perforated disks.

Another Entrant in the Shock Absorber Field.

Of the many anti-shock devices now on the market, those depending on the elastic force of compressed air hold certain advantages, says *The Car*. A useful apparatus of this type is the Amans, which is composed of a steel cylinder fitted inside with a piston worked by means of a chain passed over a small cog-wheel and joined to the axle of the car. The piston is formed of a cup-leather which, when pulled upon, presses hard against the cylinder walls and allows no air to escape past it. A small ball valve placed at one end of the cylinder enables air to be drawn in freely, and a suitable cap prevents wet and dust from penetrating. The body of the cylinder is fixed on to the frame of the car, and the working of the machine is as follows: When the car passes over an obstacle the springs give and the chain fixed to the axle becomes slack and allows the spiral spring in the cylinder to push the piston up to one end. The vacant space in the cylinder is thereby filled with air, and when the frame tries to return quickly into its place, this is compressed and offers a strong resistance which decreases gradually. When the chassis is in its normal position, the piston occupies the

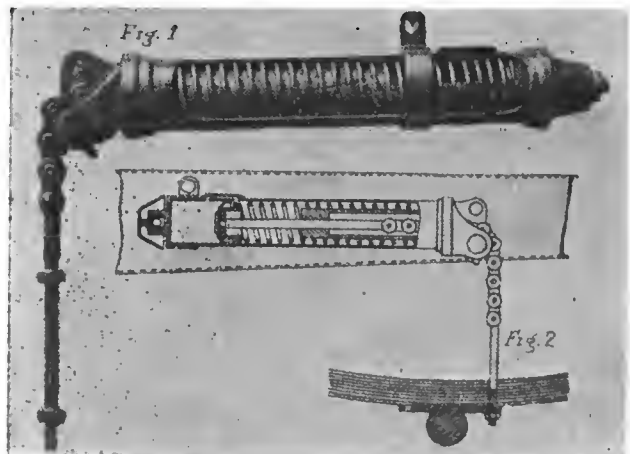


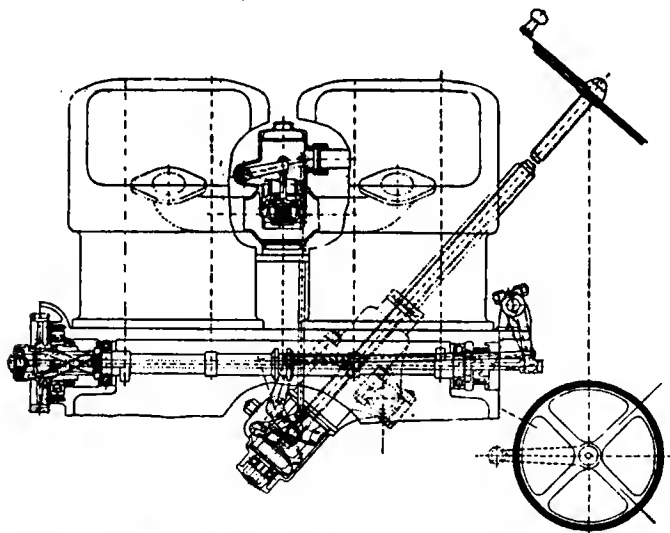
FIG. 1.—The new Amans shock absorber; tube cut a way, showing interior.
FIG. 2.—Sectional view, showing position and method of application.

the title of "Perfection" by its makers and is described in a recent issue of the *Autocar*. The recorder screws upon the hub of the front wheel in place of the ordinary axle cap and is applicable to any make of car. Without going into details of its mechanism, it will suffice to point out that its principle of work-

ing is based upon the fact that the axle of the wheel is fixed while the hub revolves. The mechanism consists of a pair of driving springs which engage with the nut at the end of the front axle. These springs are attached to a worm which drives the interior mechanism; consequently the instrument is entirely self-contained and positively driven. It is made in two patterns—trip and non-trip. Both give a continuous record up to 9,999 miles, but on the trip type there are two more dials which record up to 99 miles and automatically return to zero and recommence. This trip portion of the mechanism can be set back to zero at any time by a little button in the side of the instrument. Careful tests of the instrument extending over a considerable period and during the worst weather have shown it to be entirely accurate and dependable. Fractions of a mile are also recorded by the dial hand, which revolves once for every mile.

Device to Aid Use of Motor as a Brake.

As the result of the long-continued discussion that has been carried on pro and con regarding the advantages and the reverse of using the motor as a brake, during the course of which much of interest has been brought out, though more of absurdity has



THE SAURER MOTOR BRAKING DEVICE AS APPLIED AND OPERATED.

resulted, a Continental inventor has brought forth a device to enable the motor to be utilized as a brake, which is described in *La Suisse Sportive*. It permits of varying the passive resistance of the motor to an extent equivalent to that of its rated power, and consists of a method of regulating the compression of the air that is taken in. This is done by taking pure air through the carbureter and by delaying the opening of the exhaust valve. Under ordinary conditions no braking effect is gained from the compression alone, as it is offset by the subsequent expansion; but if the exhaust be advanced, say 90 degrees on the crank circle, part of the compression is utilized in retarding the revolution of the shaft, the rest escaping. The sooner the exhaust valve opens, the sooner it closes, that is to say, before the upper dead center, and in consequence a certain amount of air is compressed and then released before its expansion imparts any power to the motor, so that the work represented by its compression is entirely absorbed.

To obtain the maximum braking power, the exhaust may be opened during the course of an explosion and the four parts of the cycle then become as follows: (1) Inspiration through the open air valve; (2) compression, all valves closed; (3) opening of exhaust valve at upper dead center and escape of compressed air; new inspiration of fresh air at atmospheric pressure through exhaust pipe; (4) compression, all valves closed; (1a) opening of admission valve at upper dead center and escape of compressed air, new inspiration of air at atmospheric pressure; (2a) com-

pression, all valves closed, and so on. In consequence, each piston on its upward stroke furnishes an amount of resistance equivalent to the power required to compress the air in the combustion chamber, and none of this effort is returned to it by expansion on the down stroke. The amount of braking effort thus produced may be regulated at will; this is done by the driver by means of a small lever mounted on the steering wheel, as shown by the accompanying illustration of the device as applied to a motor.

PRICE OF GASOLINE STIRS EUROPE.

Europe has real fears that the price of gasoline will increase to such an extent that it will be a costly matter to satisfy the moderate appetite of a modern motor. The situation is not yet alarming, but there has been a steady increase in the price of gasoline during the last eighteen months, which, if continued, might lead to a serious situation. From 28 centimes a liter in the middle of 1906, the average price in France increased to 30 centimes at the end of the year and now stands at 34 centimes, the highest price since the beginning of the automobile industry in 1900. The profit of the retailer has decreased in greater proportion than the increase in price, a retailer who formerly made a profit of two to three dollars on a 22-gallon sale now gets but 50 or 60 cents.

The reason of the increase is readily found. Automobiling has increased in proportions that were undreamed of a few years ago; the consumption of gasoline has augmented at a ratio altogether out of proportion to the increase in the consumption of auxiliary products such as kerosene and lubricating oils, so that gasoline, which was once a minor product, owing to the small demand, is now the principal object of refining.

In France there are four large refineries at Rouen, three at Bordeaux, two at Cete and one each at Havre, Douai, Cateau, Roubaix, Lille, Bonnières, Colombes, Aubervilliers and Marseilles. These together produce roughly 1,760,000 gallons of gasoline per annum. The rest has to come from abroad.

The United States is not only the largest producer of petroleum, but the greatest exporters of gasoline. The following table shows the world's production of petroleum from 1903 to 1905, the figures being barrels of 35 gallons each:

	1903	1904	1905
United States	100,400,000	118,000,000	114,700,000
Russia	75,500,000	78,500,000	54,900,000
Straits Settlements	6,600,000	6,300,000	7,700,000
Gallcia (Austria)	5,200,000	5,900,000	5,700,000
Roumania	2,700,000	3,600,000	4,400,000
India	2,500,000	3,300,000	4,100,000
Other Countries	2,240,000	2,820,000	2,730,000

According to *La Vie Automobile*, the United States cannot continue to supply foreign countries with gasoline as she is doing at present. Automobiling is developing at such a rapid rate that in a few years Americans will consume their entire output of gasoline. This is certain from the fact that the American petroleum springs are not rich in hydrocarbon. Russia, another large producer, is in the same position as the United States; with the exception of one district of little importance, Russian petroleum produces only a small percentage of gasoline.

Roumania plays an important part in the production of gasoline, certain of its petroleums producing as high as 60 per cent. of gasoline by distillation. The exportation of gasoline from Roumania has increased in a notable degree: 29,563,572 hecoliters in 1903, 50,351,778 hecoliters in 1904 and 62,696,098 hecoliters in 1905. Of the 1905 production, 37,276,578 hecoliters, more than half the total production, was sent to France.

With the exception of Roumania, which, despite its rich wells cannot claim to supply the world, the demand for gasoline increases at a much more rapid rate than the demand for other products of mineral oils. Thus it is quite possible that, even with an almost unlimited petroleum supply, there may some day be a gasoline famine.

HOW THE MAGNETO IS UTILIZED FOR IGNITION

By CHARLES B. HAYWARD.

IN recent issues of *THE AUTOMOBILE* the various sources of electric current for ignition, as employed on the car, have been touched upon generally, and the why and wherefore of the dry cell and the accumulator dwelt upon at some length. The latter are the only chemical means of producing a current employed for the purpose on the automobile, the remaining class

is alternating and rises and falls twice during every revolution of the armature; at a certain point in each half turn the current reaches its maximum value or peak, and it is at these points that it is desired to utilize the current for ignition. By maintaining the armature winding short-circuited until these points are reached, the value of the current is still further enhanced when the circuit is suddenly opened. This is done by a mechanically operated circuit breaker, usually a cam fastened to the armature shaft itself, the latter being timed to coincide with the occurrence of the point of ignition in the cylinder.

But by adding a single essential the magneto just described may be readily converted into what has erroneously come to be termed a high-tension magneto. Instead of using the current for ignition as it comes from the magneto, it is sent through an induction coil, or step-up transformer, and raised to a high potential. It is then used in connection with the regulation jump spark plugs instead of with mechanical ignitors, as are necessary in the former case, so that what is commonly known as a high-tension magneto is merely one of the low-tension type with an induction coil. Technically speaking, it would be just as correct to term an accumulator low tension when used with an ignition system of this type and high tension when used with the latter. However, it is difficult to find a term that expresses the characteristics of the magneto in question in a word or two, and popular usage calls for short and easily remembered names, so that this one has stuck. Where one wishes to be explicit in the matter, it is sometimes referred to as "high tension, with coil." The Eisemann and Remy are familiar types.

The difference between this and the true high-tension magneto may most readily be explained by stating the latter incorporates an induction coil in its make up. The armature winding already referred to is made to serve as the primary winding of the coil besides performing the function of generating the current. A condenser completes the transforming part of the apparatus, the current collecting and circuit breaking devices remaining the same—that is, in principle, as they naturally differ materially in the various makes of machines on the market. However, it is

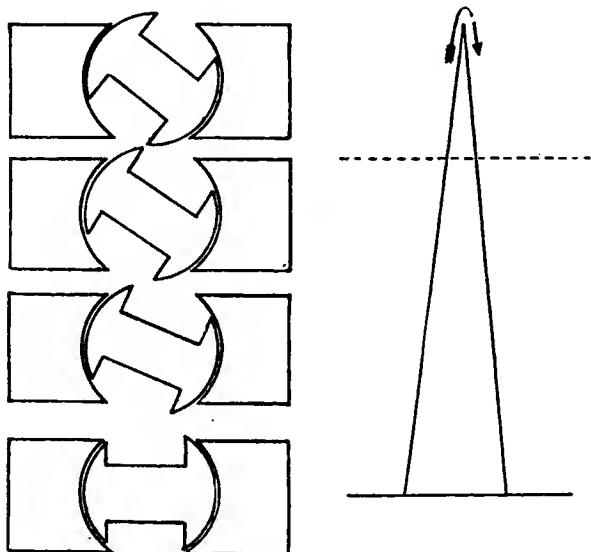


FIG. 1.—Illustrating cycle of an alternating current.

of current producers being purely mechanical, such as the small direct-current dynamo and the magneto. It is intended to take the latter up in the present article. Before doing so it may be as well to correct what appears to be a prevailing impression on the part of a very large number of autoists that the magneto is something of comparatively recent origin, which is finding itself in the first stages of its development on the automobile. How erroneous this is need hardly be called to the attention of those who are at all familiar with the past history of mechanical means of generating an electric current. Far from being a late development in this field, the magneto represents one of the earliest steps in the evolution of the alternating-current generator, but unlike so many other devices which have lost all semblance to their original in the course of improvement, the magneto is the same to-day fundamentally as it was when first invented. Probably the field in which it has met with the widest acceptance is that of telephony, where it has served faithfully for more than a score of years.

How Magnetos Differ.

There is another point that has proved extremely puzzling to a very great many autoists who are not familiar with electric machinery, and that is the real distinction between the low and high-tension types of magnetos. This arises principally from the fact that to a certain extent the terms are interchangeable. To start with the rudiments—and a clear conception of the matter can be gained in no other way—it will be well to recall what has already been given in the general outline of the magneto in a previous issue of *THE AUTOMOBILE*. That is, the nature of its components—a permanent magnetic field and a Siemen's or H-shaped armature. In what may most aptly be termed the true low-tension type, the wire on the armature consists of but a single winding, and usually with comparatively few turns of rather coarse wire, as the voltage required is low. Its sole remaining essential consists of the current-collecting apparatus. As has already been explained previously, the current generated

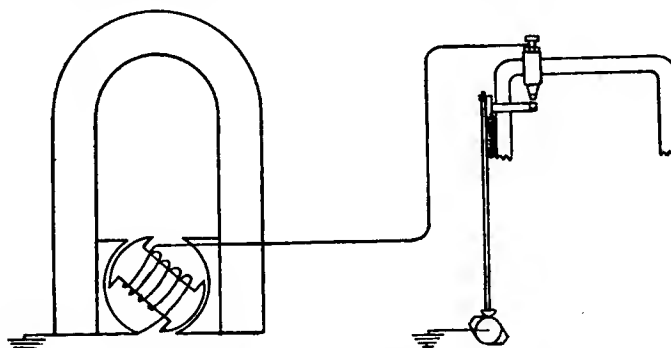


FIG. 2.—Simplicity of the wiring of low-tension systems.

not intended to go further with the description of the high-tension system at the moment, as this will be gone into more at length later on and in a separate article. The low-tension magneto was the stepping stone in this field and hence will be taken up first.

Characteristics of the Current.

Just how the magneto generates an electric current has already been explained at some length in a previous article, and need not be recalled here further than to bring to mind the fact that, if provided with the usual collector brushes, it would deliver an alternating current constantly as long as turned, as is the case when the crank of a telephone magneto is turned. As the

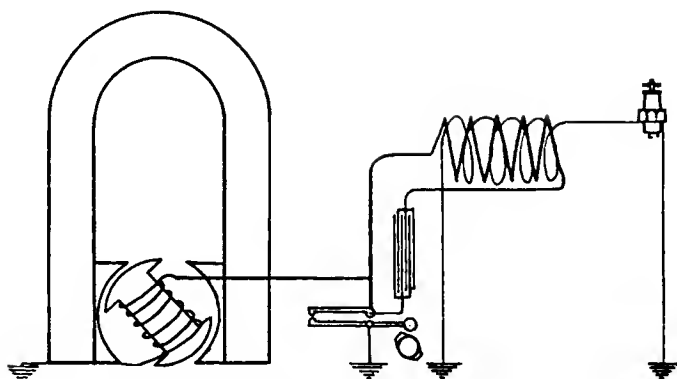


FIG. 3.—Wiring diagram, "high-tension-with-coil" system.

four-cycle, four-cylinder engine only requires two sparks per revolution for ignition, it is desired that the peak of the alternating current should coincide with the occurrence of these sparks in the cylinder in order to utilize the maximum value of the current at as low an r. p. m. rate of the magneto as possible. A slight digression is doubtless in order here to render clear exactly what is meant by the *peak* of the current wave and the reason for terming it thus. As its name indicates, an alternating current is one that surges back and forth, alternating in direction constantly. These pulsations are termed cycles, and large machines in power plants are wound to give anywhere from 25 to 100 or more cycles per second, known as the *frequency* of the current; this is so high that in electric lighting no flickering whatever is apparent, but when reproduced by a recording instrument they appear as a series of peaks rising and falling to the same distance above and below a horizontal line, which may be termed an "electric dead center." In Fig. 1 the magneto armature is shown in positions corresponding to the rise of the current during one-quarter of its revolution; in the first position it is on the center referred to, corresponding to the horizontal line or beginning of the peak, and with its revolution the current line rises, increasing in value, except that the number of steps or gradations are infinitely greater than the few indicated.

How Time of Ignition Is Altered.

The quarter revolution of the armature shown only corresponds to the rise or left-hand side of the peak in the sketch; the right-hand side or drop would occur during the next quarter revolution, and when it again met the horizontal line the armature would be centered once more. On the third quarter of its revolution the current would be represented by a line dropping below the horizontal the same distance as the peak shown, and, returning to the neutral point, the completion of the revolution and the beginning of the next, making a repetition of the peak already pictured. As it nears the upward limit of its travel and before reversing its direction, as indicated by the arrow, the current approaches its maximum value, and it is at this point that it must be utilized in order to give the greatest efficiency for ignition. The theoretically ideal point at which to do this is naturally the actual top of the peak, but as it is necessary to provide for both advancing and retarding the time of ignition, this cannot always be done. In consequence, provision is usually made to rotate the armature through part of a revolution by hand and independently of its drive, or the time at which the primary circuit is opened is altered to correspond; in some high-tension systems, such as the Bosch, this is accomplished by altering the relative position of the secondary distributor. The effect of this is to take advantage of the current either when just approaching the point of maximum value or when receding from it, as indicated by the dotted lines drawn across the upper part of the peak. As the intensity of the magneto current increases proportionately with the speed of the engine, there is usually found to be less necessity for advancing the time of ignition to the same extent as with the

battery, but current practice in magneto design allows a liberal amount of leeway in this respect, without impairing in any way the efficiency of the machine when working at either extreme.

The Different Systems Compared.

In order to render as clear as possible the fundamental differences between the low tension and the true high-tension types of magnetos, the accompanying simple sketches have been prepared. As its name indicates, in the low-tension type the current is used without being put through any preliminary process of transformation, in contrast with either of the high-tension systems, the difference between which has already been referred to. In the latter it is either sent through an independent induction coil or the latter is embodied in the magneto itself. The essentials of a low-tension system are illustrated by the sketch, Fig. 2. There is but a single winding of coarse wire on the armature; one end of this winding is grounded in the machine itself, which also grounds it on the motor when the magneto is attached to the latter, as no insulation is interposed. This simplifies matters to such an extent that but a single lead from the magneto constitutes the entire wiring; the latter is usually led to a copper bar, to which are attached switches corresponding to the ignitors of each cylinder, so that any one may be cut out at will. When the switch is closed it makes connection with an insulated plug inserted in the cylinder, as shown in the drawing.

It is the fact that some high-tension systems employ an outside coil and others do not that probably does most to puzzle the amateur autoist who likes to figure out such things for himself. The essential difference between these two is well illustrated by the accompanying sketches, which, however, are not intended to picture any particular make of magneto, but merely the general principles of the two types as manufactured in current practice for ignition purposes. Fig. 3 shows what may most correctly be described as "high tension with a coil." In order to simplify the wiring to as great an extent as possible, one side of practically every circuit is grounded as there shown; the condenser, indicated by the interlocking lines and connected across the primary circuit, being incorporated with the coil. For greater clearness, but a single plug is shown; in actual practice a distributor on the magneto itself and run at half speed by gearing is employed. The working of the primary and secondary is thus synchronized, the segment corresponding to one of the plugs passing under the distributor brush at the same instant that the primary circuit is opened by the contact breaker.

In Fig. 4 is illustrated the principle of the true high-tension system, of which the Bosch is one of the earliest and best known representatives, one in which the magneto itself generates a high-tension current directly and without the interposition of any auxiliary devices. The winding proper of the armature also serves as the primary of the induction coil, the secondary of which is also carried on the same core. The condenser is likewise embodied in the machine itself, thus making it entirely self-contained. Wherever possible, one side of each circuit is grounded, as mentioned in connection with the foregoing type, and the secondary current is distributed in much the same manner.

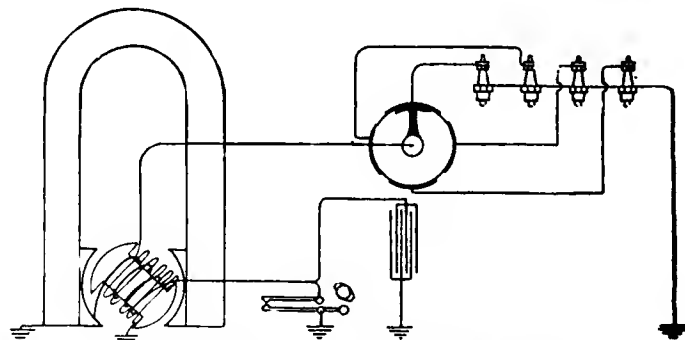


FIG. 4.—Wiring diagram of true high-tension system.

LIMITS OF THERMAL EFFICIENCY IN MOTORS*

By DUGALD CLERK, C.E.

THE Institution Committee on the Standards of Efficiency of Internal Combustion Engines, among their recommendations as to the standard engine of comparison for internal combustion motors, recommended that for the purpose of the standard, air—assumed to be a perfect gas having a value of $\gamma=1.4$ —should be taken as the working fluid. For the ordinary four-stroke cycle engine the formula giving the efficiency then was

$$\eta = 1 - \left(\frac{1}{r}\right)^{0.4}; \text{ where } \frac{1}{r}$$

was the ratio of the minimum volume to maximum volume. The committee were satisfied that with good engines, giving their best economy, the actual efficiency divided by the ideal efficiency determined by this standard could be expressed by a ratio which varied between 0.5 and 0.7. This was deduced from separate tests made by Professor Meyer and Professor Burstall. Professor Burstall's tests also showed how inefficient design would decrease the ratio, as in some of his tests means involving greatly increased cooling surfaces were employed to increase the compression, and were found to considerably diminish the ratio. These tests showed further how too high flame-temperature also decreased the ratio. The committee required, however, further knowledge as to the effect of the dimensions of the engine on the ratio, and accordingly they made tests on three engines of 5 inches, 9 inches and 14 inches diameter cylinders respectively, giving 6 i.h.p., 24 i.h.p., and 60 i.h.p. In these engines, taking the mechanical efficiency to be 88 per cent, and calculating the indicated horsepower from brake horsepower, they found that the efficiency ratios were 0.61, 0.65, and 0.69 in the three engines.

Difference Between Large and Small Engines Slight.

The tests showed, therefore, that by bearing in mind the slight changes in the ratio due to differences in dimensions, a close approximation to the best indicated efficiency to be expected from a given compression could be obtained by the use of a factor varying between 0.60 and 0.70, according to the dimensions of the engine. The tests also showed very clearly the small increase in economy of large engines in comparison with small ones, there being only 12 per cent. increase between 6 horsepower and 60 horsepower. The possible efficiency with the actual fluid used in the engine was known to be less than that given by the air standard. The committee considered that a definitely known standard from which the actual efficiency could be deduced by using a multiplier found experimentally, allowing for the imperfections of the engine as well as for variations in the properties of the working fluid, should be adopted until the properties of the working fluid were accurately known. Mr. Clark said he had examined the results of the test made by the committee and had made some further experiments on the large engine used in the test, with a view to finding the true heat distribution in the engine. The balance sheet given by the committee was as follows:

	L.	R.	X.
Exhaust waste.....	35.3	40.0	89.5
Jacket waste	23.5	29.3	25.0
Radiation	7.6	10.0	7.3
B.H.P.	26.7	28.3	29.8
	<u>93.1</u>	<u>107.6</u>	<u>101.6</u>

Every Factor Must Be Considered.

In obtaining this balance sheet the exhaust waste was determined by calorimeter, jacket waste measured, and the radiation includes friction of the working parts. The brake horsepower was determined by rope brake. In order to reason as regarded

properties of the working fluid, it was necessary to know the indicated horsepower, the loss of heat during explosion and expansion, and the heat in the gases at the end of expansion. These quantities were not given in the ordinary balance sheet, as determined above. In the ordinary test the jacket loss was always over-estimated, because some heat which ought to go to the exhaust calorimeter flowed to the water-jacket after the opening of the exhaust valve and all through the exhaust stroke of the engine. The piston friction also would appear in the water-jacket. He had, therefore, attempted to adjust the balance-sheet from data given in the committee's report. Taking the mechanical efficiencies for the three engines, L, R and X, as 0.84, 0.85 and 0.86, the friction percentage of total heat was 5.1, 5 and 4.9 respectively. Deducting this from the jacket waste, corrected values for heat to water-jacket, 21 per cent., 26.8 per cent. and 22.6 per cent. were obtained. Using these values, and reducing to percentage, assuming that the error in total heat was not in the indicated horsepower item, a new balance sheet was obtained:

	L.	R.	X.
Exhaust waste	41.1	37.1	39.9
Jacket waste	} 27.1	29.6	25.4
True radiation			
I.H.P.	31.8	33.3	34.7
	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>

Maximum Possible Efficiency Calculated.

The ideal efficiencies in these engines were practically the same, and assuming that one-third of the heat going to the engine was converted to work, and that the heat loss occurred near the beginning of the stroke, the difference between the jacket plus radiation losses in any two engines should be three times the difference between the indicated horsepower. In the L and X engines this was found to be exactly the case. The jacket waste in the L engine was evidently too low, and on the above considerations should be 34.1. This value of jacket waste for the L engine would give an exhaust waste of 34.1, which was practically the same as that determined by calorimeter. It appeared, therefore, that in the L engine some heat which should have appeared in the water-jacket had been lost. This corrected balance sheet was probably more accurate than that obtained in the test; but there was still some heat found in the water-jacket which should be in the exhaust. The experiments gave no means of determining the amount. The balance sheet, however, gave a method of calculating the maximum possible efficiency of the actual fluid. Adding exhaust waste to indicated horsepower, and dividing indicated horsepower by the sum, possible efficiencies for the three engines of 0.482, 0.473 and 0.465 were obtained. In obtaining these efficiency values, however, it had been assumed that the heat was lost at the beginning of the stroke, and therefore the values were not accurate. If the distribution of heat loss were known, the true adiabatic could be constructed and correct results obtained. To check the results, indicator diagrams which gave the correct mean pressure have been studied. From the composition of the exhaust gases and the charge temperature, the weight of the charge was found to be 0.14 lb. From the diagram the temperature drop from the end of expansion to charge temperature was 1,745° F.

The specific heat of the gases by weight, assumed constant, was 0.185. From these values, obtained from the numbers given in the committee's report, it appeared that 43 per cent. of all the heat of the combustible gases was accounted for in the exhaust. This gave a balance sheet for the X engine:

	Per Cent.
Exhaust waste	43.0
Jacket waste and radiation.....	22.3
I.H.P.	34.7

*Paper read before The Institute of Civil Engineers, London.

The exhaust waste here would obviously be greater if specific heat increased with temperature. From this balance sheet, calculated as before, an efficiency of 0.447 was obtained; with air, the efficiency would be 0.49. These considerations showed the difficulty in using the actual fluid as a standard. In spite of the great labor expended on the experiments, only a rough approximation to the true heat distribution could be arrived at. In 1884 he had made experiments on cooling after explosion in a closed vessel. Many other investigators had since done similar work, but cooling of a cylinder having a moving piston had never been investigated. He made further experiments, and determined the cooling in the X engine. The engine was run at normal speed, and when a charge had been drawn in, the rollers actuating the inlet and exhaust valves were slipped, so that the valves remained shut. The explosion then took place, and the gases instead of being discharged were alternately compressed and expanded. An indicator card gave a cooling curve, showing temperature fall during successive revolutions of the engine. From these cards the mean apparent specific heat of the gases in the cylinder had been deduced, the gases being practically the same composition as those in the committee trials.

The value given increased with increase of temperature, and had been called apparent specific heat values, because certain facts discovered were inconsistent with the change being entirely specific heat change. Calculations, assuming these numbers to be the true specific heats, were, however very nearly accurate. From the cooling curves and specific heat values so determined a balance sheet had been obtained for the X engine as follows:

	Per Cent.
Heat flow during explosion and expansion.....	16.1
Heat contained in gases at end of expansion.....	49.3
Indicated work	34.6

Efficiency of 88 Per Cent. Shown.

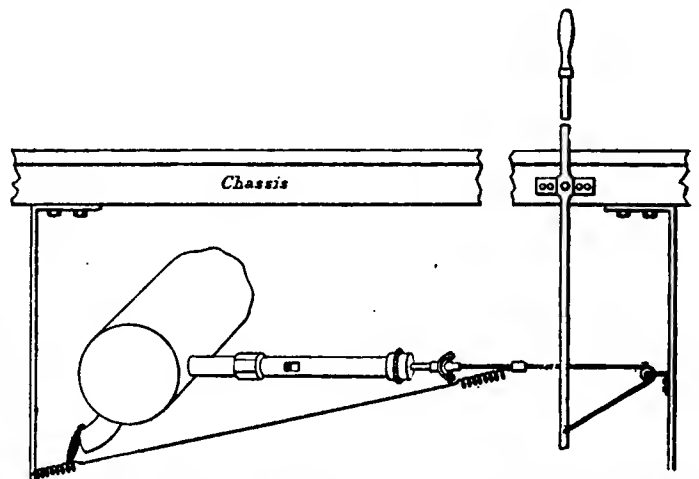
Comparing this with that found by the committee, it was seen that the indicated work was the same in both. There was, however, less heat flow during expansion, and more heat in the gases at exhaust. This showed that about 21 per cent. of the heat in the gases at the end of expansion went to the water-jacket during the opening of exhaust valve and exhaust stroke. This was considered a more accurate balance-sheet than had yet been obtained. Calculating the ideal efficiency as before, the value 41 per cent. was obtained. From the values of specific heat given, the adiabatic might be calculated, from which the ideal efficiency would be found to be 39.5 per cent., showing that the actual engine had converted 88 per cent. of the heat which it possibly could convert into indicated work. The new method had been checked by a test of a small Stockport engine in his laboratory, which gave similar results to those given by the X engine. Tables had been calculated showing the ideal efficiencies for different compressions using the specific heat values given, and showed that roughly the air standard was 20 per cent. too high, and that if gamma be taken, 1.285 for the explosion line, and 1.37 for the compression line, the change of specific heat between 1,700 degs. C. and 1,000 degs. C. commonly used in practice was too small to produce much error. More investigation was, however, required before even the apparent specific heat values could be accurately known for the various mixtures used in internal-combustion motors. Much had been recently done, including experiments by Professor Hopkinson, Messrs. Baird and Alexander, and Professor Burstall; but until further knowledge was obtained, the air standard, as defined by the committee, gave the best basis for comparing the performances of different engines. Appendices to the paper showed the method of calculating the suction temperature, charge temperature, exhaust temperature and charge weight, and also the method of calculating the adiabatic and efficiency for varying specific heats.

[ED. NOTE.—The data which the author has been able to compile as the result of the numerous experiments and investigations undertaken will doubtless be found of considerable value, particularly as it comes from an authority of such high standing.]

THE "NIGHTINGALE" AUTOMOBILE WHISTLE.

It is said that the sirens of ancient times were possessed of pleasing voices; in fact, one is given to understand that they sang as attractively as the chorus at the opera, says *L'Automobile*. The sirens placed on automobiles are, on the contrary, like their larger brothers, the steam whistles used on large vessels—organs strident and raucous, whose working is absolutely disagreeable to sensitive nerves. So far as automobile whistles are concerned, they also have the serious defect of being a torture to the ears. The development of these warning instruments should accordingly take the form of an attempt to make them more musical. We have seen the evolution of the trumpet to four for horns, on which may be placed, if not music, at least all the cavalry calls.

To remedy this state of affairs a Parisian house has just brought forth a very simple apparatus which has been christened the nightingale. It is a whistle designed to be blown by the exhaust, the note produced being varied at the will of the chauffeur. As will be plain from the accompanying line sketch of the device, it consists of a cylinder and piston of brass tubing, attached to the muffler of the car, while the protruding end of the piston rod at the other is connected to a cable. Attached to the



HOW "LE ROSSIGNOL" IS MOUNTED AND OPERATED FROM THE SEAT

same cable are two helical springs, the function of the first or right-hand one shown being to keep the piston in its normal position, which corresponds to the extreme end of its outward stroke, the hand lever acting against the spring to draw it out. The second spring shown at the left-hand side of the sketch, normally maintains the escape pipe from the muffler open, being attached at one end to a bracket and at the other to a clapper or cover for the pipe. When pushed forward the lever also draws against this spring and closes the lever at the same moment as the whistle comes into action. In the brass cylinder itself, or body of the apparatus, there are a number of holes, through which the exhaust gases pass to produce the sound. Varying the number of these explains the method used of obtaining a modulated sound, which may be sharp or very deep, depending upon the part of the cylinder the piston is drawn to at the time. The principle is that of the wood and cork whistle, which all of us have had more or less experience in making in the happy days of our boyhood, and the device itself is as simple and easily operated as those shrill toys which required nothing more than a penknife and a modicum of skill for their manufacture. Of course, considerable more study has been devoted to the design as well as the size of the parts, not to mention the materials that enter into the composition of this latter-day boy's whistle, for such it will doubtless prove in the hands of many a chauffeur. It is a signalling device that has the merit of novelty and one which permits the operator to vary its warning note at his pleasure by producing sounds that are more or less harmonious, but which at least will be less disagreeable than the voice of the average siren—something that should not be difficult.

THE IMPORTANCE OF FACILITIES IN TOURING

By THOS. J. FAY, E.E.

It is nearly as disconcerting to possess the car and nothing besides as it is to be in the fix so often described, viz., "to have everything but the car." Indeed, it is one thing to go for a ride on occasions, but it is quite another matter to tour at length in cars as they are usually found, affording, as they do, barely room enough for one's feet—if perchance the feet be not to fit the boots of one Dexter Penasus—outside of the seats.

That touring cars are rarely ever suitable for touring is a fact so thoroughly established that no one takes the trouble to wonder at the entire absence of even the conveniences that might possibly go with a 6x9-foot flat in the district of the "great unwashed." That so barren a thing as a car so full of machinery that it will hold nothing besides is a necessity is proven by the demand for such cars; but that a remedy for such a state of affairs may not be arrived at is too ludicrous to think about for even a single moment.

As a matter of fact, body work has been more or less a bungle, left to its own devices or in the hands of body-makers who, for the most part, miss the "dashboard" and say "giddap" through force of habit; all because "automobile engineers" are busy on the chassis and have but little, if any, time to devote to the design of the body. That this state of affairs can go on forever is scarcely to be believed; moreover, autoists are not the class of men to take kindly to continued neglect. Of course, body-makers are drifting away from the old carriage makers' practise, apace at any rate, although it must be said 'tis a slow motion, just as "drifting" always is. In the meantime the most enthusiastic of the autoists are doing for themselves "quite nicely, thank you."

The body-makers as a class find themselves in a passing strange predicament, for while they are condemned for making bodies heavy, they are censured for not affording space for luggage; and again, the question of "art" or appearance, like a hungry coyote, barks incessantly and presses hot-footed on the

trail. Back of all of these questions is the great matter of filling orders that seem to tumble over each other in a mad concourse, as if indeed the world must soon come to an end and everyone wants a body in which to tuck his soul.

Body-makers are therefore in the odd position of being able to market anything that looks like a body at double the true value of a serviceable body, and so, it must be confessed, they (the body-makers) can scarcely be expected to do more than "make hay while the sun shines," which is probably what they are doing.

There are, of course, a few specialists who devote their time and their skill to fine body-work, and it is to them the experienced autoist goes in quest of bodywork such as will serve a useful end. Such body-makers do very little, if any, of what might be termed "stock" work, but the product of their establishments is said to be "special," for what reason none can tell, for in all fairness these so-called "special" bodies are barely good enough for so-called stock cars. This is not to say the special bodies are inferior, but it is to say the inferior bodies should have no standing at all and the special bodies should be classed as regular. Special bodies are

so very costly, primarily because they are special, and the word implies a license to charge a special price; and again, building but one body of a kind is sure to end in a far higher cost than that which should obtain were bodies duplicated a hundred or say a thousand-fold.

The illustrations accompanying this article are offered as affording an inkling of what an ambitious autoist can do by way of providing comforts and keeping things "under cover."

Fig. 1 shows the car, ready for the road, all neat and trim, with the "chauffeur" on the job. Viewing the car as it stands it is easy to note a tool box under the running board, an extra front and hind shoe on the running board, as well as a fairly commodious "packer" just back of the shoes, but free of the side



FIG. 1.—Car completely and comfortably equipped for the tour.

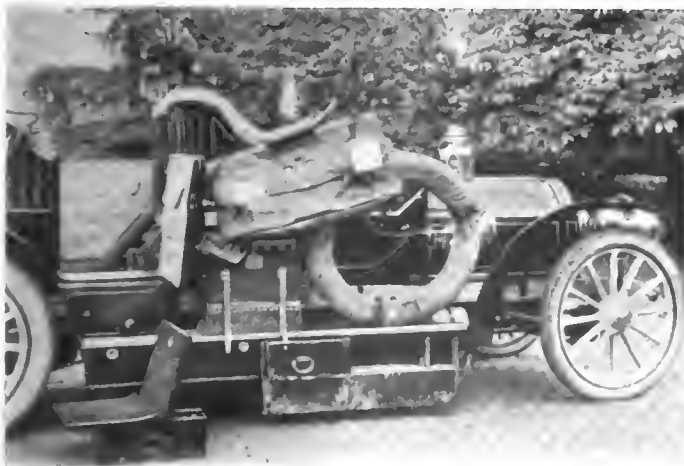


FIG. 2.—Showing the commodious and subdivided tool box.

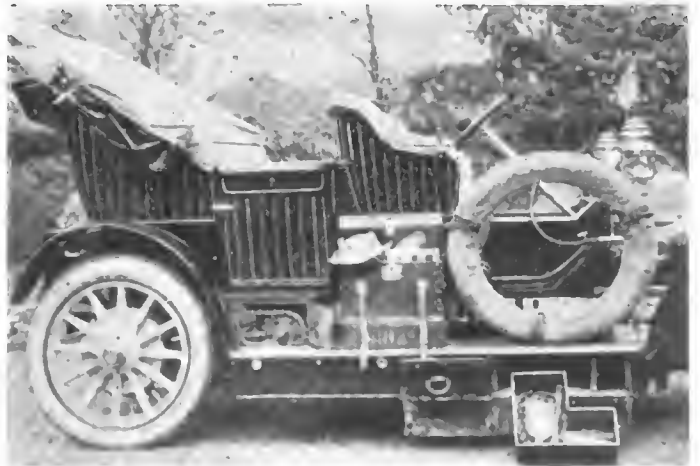


FIG. 3.—Interior of packer beneath running board exposed.



FIG. 4.—How space under rear seat is utilized to advantage.

entrance. The opposite side of the car has also a tool box under the running board, as well as a "packer," but no shoes, since, on the right side an entrance to the driver's seat must be held untrammelled.

Fig. 2 again illustrates the same side of the car, but with the drawers forming the tool box under the running board opened up to view, thus disclosing a very commodious, sub-divided space for necessities. In this figure it is plain to note that the side entrance door is not interfered with by the "packer" on the running board, and a glance at Fig 3 will disclose the open "packer" and the use to which it is put.

This view also shows the side chain of the car open to view and an extra chain in the drawer pulled out from under the running board. The autoist thus suggests that an extra sprocket chain is an article of merit, if not a necessity.

Fig. 4 shows how the space under the rear seat is utilized, which space is made to hold two very commodious packers, and the hood or cover on the ground is made to fit closely over the space, thus rendering the hiding place for the packers proof against the weather, besides holding the artistic effect of the car intact. This view also discloses a packer half drawn out—to the side—from under the front seat, besides giving an excellent view of the chest of drawers under the running board on the left side of the car. Fig. 5 shows the two packers on the ground—out of the rear pocket—and the packer half out from under the front seat, while Mr. Ellsworth—to whose ingenuity the whole arrangement owes its origin—serenely views the scene.



FIG. 5.—Commodious rear seat packers exposed to view.

It seems simplicity itself to thus arrange a car and so provide a considerable storage space for touring necessities, but there are many details to take into account. First and foremost, there is a limit to the weight to be borne by tires, and, again, the limit is nearly reached ere any provision is made for the storage of anything. It follows, then, that packers and all such means of storage must be very light, yet ever so strong, for they are bounced about incessantly.

It will also be understood that doors to cover holes and pockets are not easily swung so as not to mar the outward appearance of the body, while secure means of locking is almost past one's ingenuity. Bodies as usually constructed would scarcely lend themselves to the project in any case, since internal bracings and projections of one sort or another would most likely be in the way.

WHY THAT NEW TIRE BLEW OUT.

It frequently happens that an automobilist discovers a small hole on the outside of one of his tires and a very serious tear of the inner fabric, altogether out of proportion with the exterior defect. The defective shoe is shipped back to the factory, followed by a letter not very flattering to the manufacturer. Michelin, the tire manufacturer, says they receive many such, the motorist always declaring that it is the maker's fault, for the tire shows its deterioration in the fabric, while the rubber is hardly worn. The reply that they give is that the tire has certainly burst, but that the burst is the result of a cut from the outside. A little experiment will show this. Take a piece of unhemmed calico or linen and try to tear it. The commencement of the tear is difficult, but once begun it can be continued with little effort. Every draper knows this and cuts the calico with a pair of scissors before attempting to tear it. The fabric employed in an automobile tire has the same source of weakness as an ordinary piece of calico. A cut is made in the rubber, a sharp-edge pebble enters in and exerts its maximum effort on the fabric, not on the rubber. The constant contraction and expansion of the tire as it passes over the road soon causes the fabric to cut, and once cut the split will spread with increased facility until it has reached the extreme limits of the shoe. It is not a case of defective construction, as is so often imagined, but an example of the necessity for carefully examining the surface of the tire at frequent intervals and taking precautions to keep out all foreign matter.

AUTOMOBILE PROSPECTS IN SOUTH AMERICA.

South America as a field for the automobile manufacturer only offers mediocre interest at present, but there are indications of a widening field, according to J. B. Bartholomew, of Pretoria, Ill., manufacturer of the Glide car. Buenos Ayres, Argentina, is the city with the largest number of automobiles in use. They number rather more than 200, mostly of French and English make, with just a sprinkling of American cars among them. The import duty is 50 per cent. and the price of gasoline 60 cents a gallon. The people of the Argentine are energetic and up-to-date and there is every reason to believe that a big automobile trade may be done in their country. Pernambuco is a stranger to the automobile, and with its roughly paved streets offers little encouragement to its introduction. Bahia has two or three automobiles, but is hardly more encouraging than Pernambuco.

Rio de Janeiro has better streets than most South American cities, and possesses fifty or sixty automobiles of French and English make. The country back of Santos has a few automobiles, but none are in use in the city, and with streets in their present condition they are not likely to multiply. Montevideo is a field in which manufacturers' agents might profitably labor. The streets are fairly well paved and the mud roads are not at all in bad condition. Taken all in all, it is evident that the Argentine will for a long while constitute practically the only South American market of importance for the automobile.

LETTERS INTERESTING AND INSTRUCTIVE

The Different Styles of Spring Suspension.

Editor THE AUTOMOBILE:

[676.]—I have never been able to find any extensive comparison of the virtues of the different styles of spring systems used on automobiles, and would appreciate having you direct me to some source of such information, or, failing in that, perhaps you would find it worth while to publish something along this line. A comparison, for instance, between the various systems of using full-elliptics, half-elliptics, side springs, etc., would be very interesting. I am sure, to many others of your readers, besides myself.

Peru, Ind.

H. E. AGNEWS.

This subject is one that never has been gone into as exhaustively as might be desired by many who have the interest of the industry at heart, so it is not possible to do more than help you out with a few generalizations. The fact that several radically different constructions—the full-elliptic all-around, the half-elliptic all-around, the half-elliptic at the front and the full-elliptic at the rear, the half-elliptic at the front, and the "platform" spring at the rear, and the inverted half-elliptic crosswise at the front, for example—all are considerably standardized and capable of giving good service is enough to prove that this particular detail of automobile design will have to be submitted to many a refining process before any single standard can be achieved, if one ever is. The most-used system to-day is, of course, that employing four longitudinally-placed half-elliptic springs, one at each of the four corners of the car. A particular merit, not often mentioned, which is possessed by this arrangement is that of supporting the frame at eight different, separated points. These points are, moreover, in the best designs, spaced in two series of four each along the two sides of the car. In this way the tendency of running over uneven roads to produce frame flexions must be materially reduced, while at the same time a lighter construction is permitted, inasmuch as the stresses are reduced in magnitude to a degree proportionate to their multiplication in number. Four half-elliptics have the further merit of being light and inexpensive for a given duty, so their wide popularity is not to be wondered at. In favor of full-elliptics is their extreme elasticity and their freedom from the necessity for shackling—merits well established as worth while by their wide prevalence in the best horse vehicle practise. Other of the constructions enumerated may be said to constitute compromises between the full-elliptic all-around and the half-elliptic all-around. Thus the full-elliptic at the front and the platform arrangement at the rear supports the frame at seven points, as against four and eight, respectively, for its two chief competitors. The transverse inverted elliptic at the front, in combination with full-elliptics at the rear, produces a three-point support of the frame, thus removing all tendency to distortion from road roughness, but the frame must be strengthened to withstand the increased stresses due to carrying the weight on points that are more widely separated. For any further information on this subject, we must refer you to the spring manufacturers or to the makers of cars.

What American Cars Have Variable Inlet Valves?

Editor THE AUTOMOBILE:

[677.]—Will you kindly publish a list of the American cars and foreign cars sold in America that are fitted with a variable lift to the inlet valves? This method of throttling is so obviously superior to the customary method of throttling the inlet pipe or carbureter, that it should be given a wide publicity and demanded by purchasers of high-grade cars. If you would like a short statement of these advantages, the writer will be glad to furnish them.

Los Angeles, Cal.

ANGELOS.

We do not know of any American cars now on the market that are fitted with the variable-lift inlet valve method of throttling, and, so far as our knowledge goes, the only foreign car sold in this country built on this plan is the Brasier. We believe some of the Renault cars were so equipped in 1905, but it was subsequently abandoned. If you wish to submit an outline of the advantages of this method, we will be pleased to consider it.

Cambering the Driving Wheels of a Car.

Editor THE AUTOMOBILE:

[678.]—Is there any objection to cambering the rear wheels with double chain drive, the effect of such cambering being to twist the chains slightly? If this is objectionable, is there not some way of so arranging the differential that the countershaft can form an angle between its two parts equal to the amount of the camber? Finally, just what are the advantages of cambering?

Litchfield, Ill.

JOSEPH A. KIMBER.

A great many cars are built with double-chain drive and cambered wheels, with the chains therefore slightly twisted as you describe. With sufficiently long and flexible chains, there appears to be no serious objection to such twisting. In fact, any chain drive on an automobile necessarily works with the chains twisted much of the time, whether the wheels are cambered or not, for the effect of all road irregularities that temporarily destroy the parallelism of the rear axle and the countershaft is to twist the chains. And inasmuch as few roads are so smooth as not to produce constant sidewise tilting of the rear axle, it follows that chains are proved to operate, and operate well, despite slight twisting. By placing a special differential on the propeller shaft a number of shaft-driven cars are made with cambered wheels. The same plan can be applied to a countershaft. Cambering is very necessary for front wheels, to facilitate steering by placing the point of support on the ground under where a prolongation of the steering-pivot axis would strike. For rear wheels it probably is less necessary than has been believed in the past, when wheels were more markedly dished than is common practice nowadays. Camber originated with horse-vehicle wheels, as a means of keeping the load-supporting spokes vertical despite the dish, which served to oppose the rigidity of a flattened cone—as compared with that of a plain disk—against skidding or slewing forces.

Some Problems of the Differential.

Editor THE AUTOMOBILE:

[679.]—In reading foreign automobile periodicals, I have recently run across a number of articles on experimental automobiles in which the differential gear is eliminated, its place being taken by clutches, ratchets, or the like. All of the discussion on the subject, though, has been so excessively technical (from my standpoint) that I must frankly confess an inability to grasp its points. Will you please tell me what objections there are to the differential? I had always supposed that the purpose of this was to permit one rear wheel to run faster than the other in going around curves, the outer wheel naturally having to traverse a curve of greater length than that taken by the inner wheel. This being the case, why is not a regular differential gear perfectly satisfactory, it being an evident fact that it permits one wheel to make the required gain over the other, while at the same time maintaining the application of power to both wheels?

Dubuque, Ia.

C. N. HENDERSON.

The fundamental fault with the balance gear, which is the type of differential used on practically all modern cars, is that it differentiates for *resistances* instead of for *distances*, whereas an ideal mechanism for its place would differentiate solely for distance. The effort to drive both wheels, however, while at the same time permitting one to rotate faster than the other, inevitably involves the trouble referred to. Consequently, only when the difference in resistance is proportional to the difference in distance can the differentiating be correct. Fortunately, this is the usual case when both driving wheels are on road surface of uniform character, but if one strikes a slippery spot, while the other is on a dry one, the latter may constitute a non-rotating pivotal point from which a doubly-rapid forward rotation of the other may be executed. Or, in a less extreme case, the wheel on the drier surface may continue to rotate, but at a rate much slower than that of the wheel on the slippery surface. In either case, a serious skid may be produced. Moreover, in turning a curve, the action is not to apply the power equally through both wheels under any circumstances. Either one or both of

the wheels must slip on the road surface in a degree sufficient to equalize their speeds, or more power must be applied through the outer wheel, because its rate of rotation becomes greater while the tractive stress imparted through it remains the same. A growing realization of these deficiencies of the balance gear seems to be bringing a number of leading European engineers to the belief that it can be discarded with advantage in favor of ratchet and clutch devices. With a ratchet, for instance, the equalizing for varying distance always is perfect, but the drive is definitely applied through the inner wheel on curves. And that this may not be as bad as it appears is suggested in the fact that ordinary running is straight ahead, while curves, when encountered, are in one direction as often as they are in the other. In making one complete turn, no matter of what size, the circumference of the circle traversed by the outer wheel always is greater than the circle traversed by the inner wheel by an amount equal to double the tread, multiplied by 3.1416. This, in the case of a 56-inch tread, is about thirty feet further for the outer wheel to travel. In the case of a car without differential or any equivalent, this means (if the slip be divided equally) that each rear wheel (if thirty-six inches in diameter) must slip one and one-half revolutions in making a complete circle, three-eighths of a revolution in making the more usual quarter turn, and so on. A further advantage of the ratchet is that it permits use of an undivided rear axle or countershaft. The elimination of all differentiating means gives, of course, a still more substantial rotating construction, which is in a degree retained if a clutch in each hub is used, sufficiently tight to drive ordinarily, yet sufficiently loose to slip before the resistance rises high enough to abrade the tire seriously.

Air Cooling by Flanges and by Jackets.

Editor THE AUTOMOBILE:

[680.]—Which is generally regarded as the most successful system of air cooling—that using flanges on the cylinder to radiate the heat, or the one in which air is blown through a jacket surrounding the cylinder? With a flanged cylinder, is it not best to make the flanges of copper or some other metal of high heat conductivity, and to finish the surfaces a dead black, to promote radiation? If not, why not?

Pasadena, Cal.

KARL HANFORD.

It scarcely is possible to decide arbitrarily between the two systems of cooling you mention, since both have proved very successful in practical use, and each has a large following of enthusiastic advocates. It is quite possible, too, you know, that there may be more than one way of doing a thing as it should be done. Air cooling by means of flanges proves very effective on numbers of excellent American cars, while the other system, involving the air jacket, demonstrated its merit so far back as on Daimler's first liquid-fuel engine. The best results obtained with both systems have been gained apparently not alone by careful consideration of external conditions, but by also having regard to what goes on within the cylinders. Low compression, for instance, seems to help air cooling, as also does the provision of an auxiliary exhaust port or valve, to drop the terminal pressure of the burned charges very low before permitting any part of them to escape through the regular exhaust valve. Your mention of radiation as a factor in the cooling suggests somewhat of a misapprehension of conditions. While it is true that a heated surface radiates heat in proportion to the character of its finish—dull black surfaces radiating the best—it must not be forgotten that by far the most of the heat removed from a gasoline engine cylinder during the process of cooling is not radiated, but is carried away by convection—by actual contact of particles of air with the heated surfaces. Flanges thus aid cooling simply by affording a greater area of surface for the air to work, but since a given volume of air has a given heat capacity, if this volume can be crowded through the comparatively narrow space of an air jacket, it will pick up a given number of heat units, even though from a less surface. The objection to attached flanges is the impossibility of making a joint between

two dissimilar metals so perfect that it possesses a heat conductivity equal to that of a similar area of the unbroken metal. Because of this consideration, the property of the metal to conduct more heat to a greater area is in a degree offset by the inability to transfer the heat with corresponding rapidity from the cylinder metal to the flange metal.

SUGGESTED IN EXPLANATION OF No. 644.

Editor THE AUTOMOBILE:

[681.]—In regard to letter No. 644. It looks as though this man has a lot of trouble with his carbureter. I think he is looking in the wrong place for his trouble. He has a leaky intake pipe. Some of the gaskets or joints must leak, for when he closes his throttle, he says that the engine misses, which shows that the air is going into the engine some other way than through the carbureter. I think if he will look over his intake pipe he will find the trouble.

D. F. MACARTHUR.

East Boston, Mass.

Editor THE AUTOMOBILE:

[682.]—In regard to letter No. 644, describing "A Puzzling Carbureter Ailment," I have a suggestion to make which might possibly be of service. My car once developed similar symptoms; it skipped when the throttle was closed, but ran evenly as soon as the speed of the motor was increased. In my case, however, the skipping was confined to one particular cylinder. I found the trouble to be caused by a leaky gasket when the inlet pipe joined the defective cylinder. At slow speeds enough air was drawn in at this point to seriously weaken the mixture in that cylinder. At higher speeds this small quantity of extra air was not enough to materially affect the mixture. Now, in the case described in letter No. 644 the skipping occurred in all four cylinders at different times. It might be, then, bearing in mind my experience, that there was a leak somewhere in the main inlet pipe, that is, before it separates to go to the different cylinders. If such a condition existed, partially closing the air inlet to the carbureter at slow speeds would give the proper supply of air, as the writer of the letter discovered. Thus the trouble seems to me more likely to be outside of the carbureter, especially since these carbureters (Schebler) are not prone to this particular trouble, I believe.

Cambridge, Mass.

SUGGESTION.

Editor THE AUTOMOBILE:

[683.]—I have had the same trouble that Dick Willes complains of in No. 644, your issue of March 21. I find that giving the engine a good injection of kerosene oil will help. I take out all of the spark plugs and turn over until one of the exhaust valves is at its highest lift, fill my oil gun with kerosene and shoot half of it at the valve stem, the balance on top of the piston, continuing until all the cylinders have been treated. Then turn over the engine for some time to work the oil well into all the crevices. Then start the engine and while running slowly give the inlet valve stems a dose of the same.

Will advise him to make an extension to the throttle lever to the center of the air inlet, making a hole in the extension at the edge of the air inlet. Make a circular plate the size of the opening of the air inlet with a threaded peg at one edge which pass up through the hole in the extension, and lock nut to hold it in position over the air inlet. The plate can be adjusted to entirely close the air inlet when throttle is closed and opening with it will open the inlet as desired.

Decrease the tension of the poppet valve, and increase the gasoline supply to correspond with the increased supply of air.

Lindsborg, Kan.

A. E. AGRELIUS.

"NUTMEGGER" ON NEW YORK-BOSTON "RACES."

Editor THE AUTOMOBILE:

[684.]—It is to be hoped that you, as an exponent of safe and sane automobilism, will lend your aid to the crusade which has been started against the shameless lawbreakers who take part in the races, alas endurance runs, between New York and Boston. If these fellows do not possess any sense of moral decency or regard for the rights of others, it is high time they were made to, even though it might be necessary to use a club in the process. The run, as everyone knows, was made simply to gain a little cheap notoriety and a free advertisement for their cars. The advertisement which resulted, however, is not of the kind which they sought, as, in this section, at least, it has resulted in much bad feeling and in turning the buying public away from these particular cars. A manufacturer who turns out a car that can lay claim to real worth does not find it necessary to resort to such tactics in order to sell his product.

Every automobilist knows that in the past it has been necessary to fight the unfair restrictive measures which are yearly proposed in the legislatures of the different States, and now that he

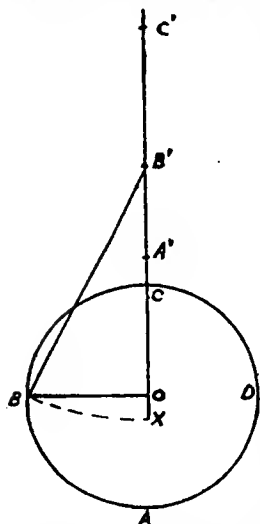
has succeeded in obtaining some rights that even the country constable is bound to respect, he finds them jeopardized by a few narrow-minded speed cranks. The legislature of the State of Connecticut is in session, and the effect of this race on the minds of the legislators will be anxiously watched by those who look upon automobilism as an elevating recreation. The unfortunate part of it is that these racers do not suffer for their misdeeds. They go by with a rush, and are out of harm's way before the authorities awoken to the fact that the law has been flagrantly violated. Then the next fellow, who, wishing to leave business cares behind, to get a breath of fresh air, to enjoy the scenery and to see the country as God made it, with every intention of obeying the spirit as well as the letter of the law, is stopped, haled into court and made to bear the burden of an excessive fine, which, by every reason of justice and equity, should be paid by the intentional transgressor. It is to be fondly hoped that the opinion of those who are the actual buyers of cars will be so potent a factor against those manufacturers who indulge in this practice, as to make it, in the future, impossible.

B. E. H.
Norwalk, Conn.

A SIMPLE SOLUTION OF THE PROBLEM.

Editor THE AUTOMOBILE:

[685.]—In a recent issue was given a trigonometrical proof that the descending piston of a vertical engine travels a greater distance during the first quarter revolution of the crank than it travels during the second quarter. This proof was all right, but it seemed to me to either contain typographical errors or else to be so high as to be over the head of an average intellect like mine. I therefore take the liberty to submit a proof simple enough for the average school-boy.



PISTON TRAVEL DIAGRAM.

Let A, B, C, D be the crank pin circle, with O the center of the circle representing the crankshaft. Let A A', B B' and C C' equal each other and represent the length of the connecting rod in top, middle and bottom positions respectively. It is self-evident that if the rod B B' is allowed to swing or revolve on the wrist pin B' its crank pin end B will describe an arc BX, and that the line B' will be equal to the line B'B. This shows clearly that the piston must be as much below the center of its stroke as X is below O, and that it therefore travels in the first quarter of a revolution a distance equal to C X, and can only travel the remaining distance X A in the second quarter revolution. It is also evident that the rising piston will travel the distance A X in the third quarter and the distance X C in the fourth quarter revolution of the crankshaft.

If the exact distances traveled are desired one needs only to know that the sum of the squares of the two shorter sides of a right angle triangle is equal to the square of the hypotenuse, and (since the lengths of B.O. and B B' are known) subtract the square of B.O. from the square B B' and extract the root of the remainder. This will give the length of B' O, which subtracted from B B' or its equivalent B'X, will give the distance O.X., which added to C O makes the piston travel. Further, the distance O.X. subtracted from O A gives the piston travel of the second or third quarters M, and it is quite plain that C X is greater than X A 20X.

C. E. DURYEA.
Reading, Pa.

E. R. THOMAS' CHALLENGE ACCEPTED.

Editor THE AUTOMOBILE:

[686.]—With reference to the challenge issued by Mr. Thomas to Mr. Rolls on account of some remarks of the latter re American cars.

I notice that Mr. Rolls has not been able to accept Mr. Thomas' challenge to pit his British-built car against an American Thomas, but I hope that, as it is a question of superiority, or otherwise, of British products, Mr. Thomas will not be averse to match his car against another British car.

If Mr. Thomas is agreeable (or failing Mr. Thomas any other American manufacturer), I would like to match an Arrol-Johnston car against the American, and suggest that the terms of competition be two or more events, half to be contested in Great Britain, and half in America. The first event to be the International Reliability Trial in Scotland, June 25 to 29, over some of the very worst and hilliest roads in the kingdom, or the International Tourist Trophy Race in the Isle of Man, May 28.

In order to assure the American manufacturer that he will have a worthy competitor, I will remind him that in the six reliability trials since 1900 the Arrol-Johnston cars secured ten awards. In 1905 the Arrol-Johnston won the Tourist Trophy Race (Mr. Rolls' car second), and in 1906, in the same race, the Arrol-Johnston car was credited with fastest time after deducting time occupied for stoppages for tires. The stoppages were entirely a matter of luck, and in no way detract from the performance of the Arrol-Johnston production.

As far as the American events are concerned, any competition giving fair field and no favor will be acceptable to me.

Warrington, England.
ERNEST ARNOTT.

MORE LIGHT ON CURRENT CONSUMPTION.

Editor THE AUTOMOBILE:

[687.]—I notice that there is very little said in regard to current consumption, and the matter has about dropped. The letter which Harrold Brown, of Boston, wrote a short time ago was very comprehensive. I think that it demonstrated that with the ordinary form of timers, not accounting for the lags, etc., that takes place, that current consumption is the same at all speeds. Later you made the statement that it was followed up by a correspondent that current consumption depended more upon the surge that takes place upon the breaking of the contact in the timer than upon the actual time the car runs. Now I beg to call your attention to the fact that the surge does not in any way draw upon the source of the current, but is an induced current that takes place in the primary winding, and is in an opposite direction to the flow of the current from the batteries, therefore it does not draw upon the source, but opposes it, and consequently can in no way increase the amount of current consumed.

I might add for the benefit of Mr. Thomas, of Raleigh, and the gentleman who has the six-cylinder Ford, that it is no unusual thing for one cylinder to get more oil than another, and it can be caused from a number of things, such as the bolt that holds the connecting rod bearings together extending down too far, and kicking up more oil than is necessary; also by loose piston rings; by lack of compression; by poor ignition in one or more cylinders; and various other causes. You cannot, therefore, expect to have the cylinders receive the same amount of oil.

Columbia, S. C.
CLARENCE T. JONES.

HOW TO PREVENT CARBONIZATION.

Editor THE AUTOMOBILE:

[681.]—Referring to letter No. 640. According to this letter, Subscriber has a lot of trouble with his motor carbonizing. This is the trouble most people are having with their motors. You will find on most motors that the cylinder is counterbored out at the top (combustion chamber) a little more than the finished bore of the cylinder. When the engine is set up you will find that the piston comes up past this counterbore, that is, past the finished part of the cylinder about 1-8 inch, and on some motors about 1-4 inch. Every time the piston comes up it wipes off a little oil, and when the explosion takes place it will spread this around the piston head and cylinder top. This oil absorbs the soot or carbon of the dead gases and deposits it on the piston and cylinder. You will also find, that when the motor misses fire much, it will carbonize much faster. The only way to overcome this trouble is to raise the cylinders so that piston will not come up past the counterbore. I have done this on several machines with good results. The cylinders can be raised by fitting a piece of brass under them. I would advise Subscriber to look into his cylinders, and I think he will find the trouble to be as I say.

East Boston, Mass.
D. F. MacARTHUR.

HOW TO PREVENT SOOTING THE PLUGS.

Editor THE AUTOMOBILE:

[680.]—I note in your issue of March 14th, letter No. 631, in which Mr. Royster complains of trouble with his six-cylinder car, in that the spark plugs on the first three cylinders are frequently fouled while the rear cylinders are not. I think the trouble is easily explained by the fact that Mr. Royster is either too exclusive or too particular in his choice of passengers, and does not keep the rear end of his machine sufficiently loaded, that his engine may be level when running, or in other words, the front end of his machine is low, causing the oil in the crankcase to run to the forward end, giving an excess of oil in the front end of his engine.

If this trouble cannot be corrected by carrying more passengers, which, of course is not always practical, or desirable, the front end of the machine will have to be furnished with stronger springs, or blocks inserted between the present springs and the front axle, to raise the front end of the machine the required amount. If Mr. Royster will use "Soot Proof Plugs" he may also overcome a great deal of his trouble.

Denver, Col.
LEWIS SEARING.



PICTURESQUE CENTRAL OHIO SCENERY NEAR NELSONVILLE.



MISS KATE WRIGHT ENJOYING HER QUEEN CAR.

THROUGH THE HOCKING VALLEY.

By N. J. THEISS.

NELSONVILLE, O., April 1.—Little is known to the autoist of what may be seen on a trip through the Hocking Valley. To strangers the people of this valley have been pictured as supernatural beings, with horns, until travelers have been afraid to venture through this section of the country. This, the center of one of the largest coal fields of the United States, should be a place of much interest to people who have never seen large coal mines. It is a great sight to have opportunity of seeing the "black diamonds" hauled from the hills at the rate of 6,000 tons per day from a single mine. Access may be had to almost any mine, and you will not find a set of people more anxious to accommodate auto tourists than the miners of the Hocking Valley.

At Nelsonville, a city of 7,000 people, and at Athens, of 6,000 population, hotel accommodations are good, the cost for same very moderate. Storage for the machine is not usually more than 25 cents a night. The roads are all limestone pike and generally level. The writer was able to drive from Columbus to Nelsonville, a distance of sixty-four miles, without disengaging the clutch to change from the high gear. An idea of the road con-

dition may be had from the picture in the lower left-hand corner of this page, and also a slight idea of the scenery along the road as you near Nelsonville. In the summer the roads are good from Nelsonville to the Ohio river, thence south in whatever direction desired. Mr. Autoist, take a drive through the Hocking Valley for a change.

MANY NEW PRIVATE GARAGES AT NEWPORT.

NEWPORT, R. I., April 1.—What may be regarded as a reasonably clear indication of the trend of events is to be seen in the fact that many Newport residents are arranging to have automobile garages on their estates next summer and dispense with horses entirely. William B. Leeds, who purchased the Frederick Vanderbilt estate, is selling all his horses and arranging to have the Vanderbilt stables transformed into a garage for six big machines. Perry Belmont, Delancy Kane, Pembroke Clark, Elisha Dyer, Jr., Edward J. Berwind, E. Rollins Mors, Pembroke Jones and a dozen other prominent summer residents are having garages built on their estates. Indications point strongly to the end of the famous Newport driving hour, with the handsome turnouts for which the place has been famous for years.



THE ROAD FROM COLUMBUS TO NELSONVILLE, O.



MR. THEISS AND PARTY FORDING A CREEK ON THE ROUTE

ROLLS-ROYCE SIX-CYLINDER MODELS FOR 1907

THE latest British immigrant, the Rolls-Royce automobile, won popular favor in the old country before invading the new. In the Tourist Trophy race of last year the Hon. C. S. Rolls, driving one of his own machines, defeated the best automobiles of his native land and not a few from France. A few months ago Mr. Rolls came over to this country and left behind him in the hands of Walter C. Martin, of Broadway and Sixty-second street, the American agency under the title of Rolls-Royce Import Company. Only two models are now constructed, both of six-cylinder type, the four-cylinder type which was so successful last year being discontinued.

Standard specifications are 30-40-horsepower model, three pairs of cylinders 4x5 inches bore and stroke, automatic carbureter, centrifugal governor, synchronized ignition by high tension jump spark, two independent sets of accumulators being used. Lubrication is of force feed type. Cylinders are water cooled, tubular radiator, gear driven pump and belt driven fan being employed. Large leather faced cone clutch self-contained to assure concentricity. Sliding gears of selective type are employed, with direct drive on third speed. Propeller shaft drive to rear live axle. Brakes are of internal type on drums of rear wheels and external on large pulley on main shaft. The 40-50-horsepower model has six cylinders cast in two pairs of three. A high tension Simms-Bosch magneto is fitted, there being two independent ignition systems, with both sets of sparking plugs carried in the cylinder heads. Other main features are the same as on the smaller body.

Examining more closely the newer model, the 40-50-horsepower machine, we find that frame is of pressed steel, narrowed in front to give a wider steering angle, wheel base 135 inches and track 56 inches. The frame is carried on longitudinal semi-elliptic springs with a transverse spring in rear. The two groups of three cylinders, 4 1-2 by 4 1-2 bore and stroke developing 48-horsepower at 1200 revolutions, are mounted on an aluminum crank case suspended from the frame by brackets at the rear and a special arrangement of levers at the forward end. The lower half of the crank case is easily dismantlable for inspection. Each cylinder is completely surrounded by a water jacket, there being no two adjacent cylinders without water between them. The crankshaft is a solid nickel steel forging, with big bearings at each end and in the center, provided with an anti-friction lining carried in a phosphor-bronze bush. The valve chambers are placed on the left hand side of the engine, one

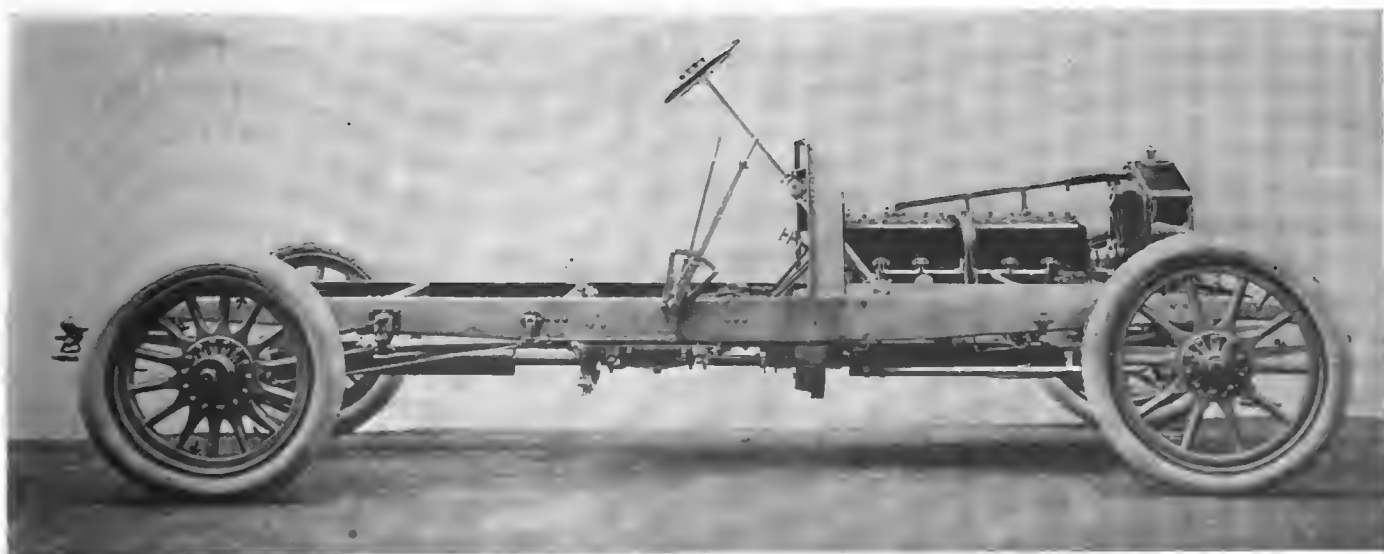
camshaft serving to operate all valves. The shaft and its cams are machined out of the solid. Inlet and exhaust valves are of nickel steel and are interchangeable. The induction and exhaust valves are operated by means of rocking levers pivoted at one end and fitted at the other with a friction roller lying between the valve spindle and the cam. These levers are mounted in pairs, one inlet and one exhaust mounted on one base and attached to the crank chamber by studs. This friction roller lever is claimed to do away with the side pressure which is exerted on the lifter slides when cam and tappet rod come into actual contact. A rather unique arrangement is adopted in connection with the exhaust pipes, there being a small expansion chamber to each set of cylinders leading away to the main expansion chamber below the frame.

The Carbureter is carried in an accessible position on the right hand side of the engine, with induction pipes leading away between the two sets of cylinders joining up to the distributor pipe at the center. The apparatus is a special Rolls-Royce design consisting of three parts very easily dismantlable, provided with an adjustable needle valve with a special locking fork. It is warmed by both hot air from the cylinder walls and hot water from the circulating water system.

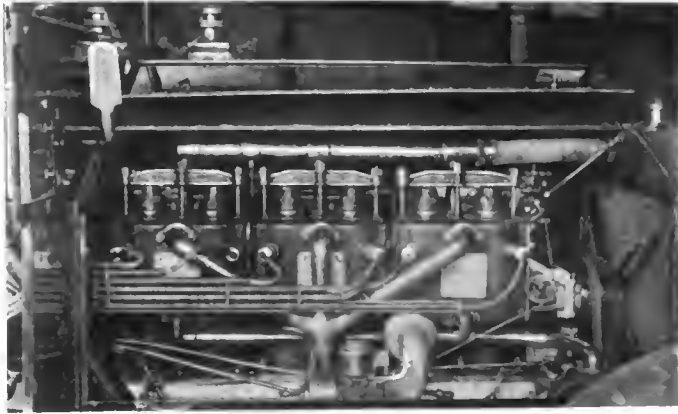
Ignition.—A gear driven Simms-Bosch magneto is employed on the 40-50-horsepower model, but the engine has in addition accumulators and coil with independent plugs in the cylinder heads. Operated by independent gearing on the right hand side of the engine are the ignition distributor and water circulating pump. The coil for the ignition system and the two switches for the double system of ignition are the only parts of the apparatus carried on the dashboard.

Lubrication System.—Lubrication is assured by a positive feed oil pump skew driven off the camshaft and delivering oil under pressure to the main bearings, and thence through the hollow crankshaft to the crank pins and gudgeon pins. By means of an easily adjustable valve under the pump cover a constant pressure of oil is maintained in the oil leads independently of the oil in the reservoir under the crank chamber to which the oil runs through a filter after dropping from the bearings.

Clutch and Gears.—A leather-faced cone clutch is employed of very large diameter and wide face, and self contained to insure concentricity. The gear box is mounted on a sub frame. Direct drive is on the third speed, a gear drive being the high



ROLLS-ROYCE SIX-CYLINDER, 40-50 HORSEPOWER CHASSIS, WHICH HAS JUST MADE ITS DEBUT IN AMERICA.



INTAKE SIDE SIX-CYLINDER, 30-40 H.P. ROLLS-ROYCE.

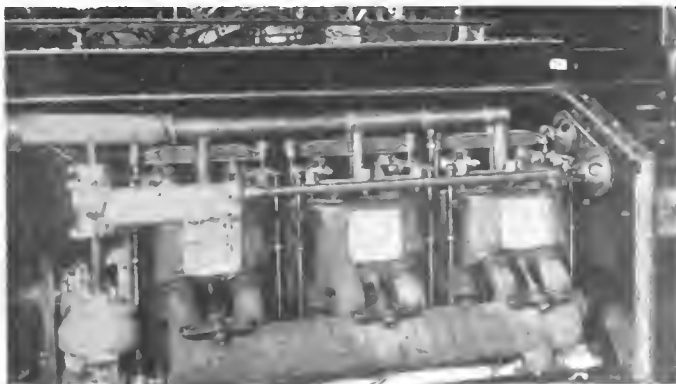
speed. The change speed gear is of the selective type, giving four speeds forward and reverse.

Drive is through propeller shaft and bevel gear to rear live axle. The differential casing is a neat piece of work, comparing very favorably in size with any of the best machines of this type. Hess-Bright roller bearings are used in the rear road wheels.

Brakes.—Internal contracting band brakes operated by the side lever are fitted on drums on the rear wheels. On the driving shaft, immediately behind the gear box, is a 14-inch metal drum fitted with a powerful contracting band brake operated by a pedal. One of the features of this is an arrangement by which the brake can be adjusted by hand entirely without the use of tools. A screwed adjustment rod is provided with a thumb nut, and in order that this nut may not slack back after it has once been set, a spring bolt is fitted to a toggle lever by which the brake is operated.

Control is by spark and throttle lever on the steering wheel. Pedals operate clutch and brake, and there is in addition an accelerator pedal. The steering gear is of reversible type with connecting bar behind front axle on the 40-50 horsepower model.

Thirty-four Horsepower Model.—As will be seen from the illustrations, the smaller size Rolls-Royce differs in several respects from the 40-50 model. Differences are to be found in the engine only, the transmission, drive and other parts being the same in both models. It will be noted that the inlet valves are in the head, operated by rocker arms, all valves being operated by a single camshaft. The exhaust is led into an expansion chamber running the full length of the engine and led to the large expansion chamber at the rear of the frame. There is naturally a different arrangement of the inlet pipes, the cylinders being in three pairs. The induction pipes lead up from the carbureter on the center of the engine in the form of a three arm, one pipe going to each pair of cylinders. There is only one ignition system on this model; the sparking plugs are placed in the sides of the cylinders.



EXHAUST SIDE SIX-CYLINDER, 30-40 H.P. ROLLS-ROYCE.

HOW ONE PIONEER BUILDER BLAZED THE WAY.

PORTLAND, ME., April 1.—S. A. Nickerson, a pioneer in the automobile industry in America, is a native of Belfast, Me., and a mechanical engineering expert of national reputation. Last fall Mr. Nickerson decided that he wanted to get back to his native State, and, refusing several alluring offers, took the agency here for the George N. Pierce Company, a firm with which he has been for several years. He went into the employ of the company in 1900 and is an expert in the building of steam cars.

Mr. Nickerson drove the first wagon ever propelled by steam. That was in 1869. It was a crude affair built by the House Bros., who were connected with the old Wheeler & Wilson sewing machine business. Mr. Nickerson was called to their factory as an expert to complete this steam carriage. There was a very strong prejudice against its use in the public streets, and to operate it a special permit had to be taken out. The car complete weighed 5,000 pounds. It had wooden wheels with iron tires, and carried three men, a stoker, engineer and helmsman. In 1871 the old contrivance was torn to pieces. Henry House took the wagon apart, turned it into a farm wagon, and used it on his farm in Connecticut. His brother, James A. House, took the boiler, and some time afterwards heated his house and greenhouse with it. Mr. Nickerson took the engine and installed it in his 45-foot open launch.

Mr. Nickerson's next venture in the motor carriage line was in 1886, in another section of the country. He was invited to Massachusetts to assist in building a steam road wagon, which weighed 500 pounds. It would carry one operator, who controlled the entire machine, and one passenger. The power was generated from burning kerosene oil under high pressure by vaporization. The wheels were 48-inch bicycle wheels with seven-eighths inch solid tires. It would make very satisfactory speed on the road, Mr. Nickerson said, but the roads were not at their best then. The public was not then ready to accept a steam road carriage, and the pneumatic tire hadn't come in to make possible a practicable automobile.

In 1895 Mr. Nickerson was again called in as an expert in the building of a steam wagon, and in 1899 went to Chicopee Falls, Mass., to complete for the Overman Co. the first Victor road steam wagon. Then in 1900 he went to Buffalo with the George N. Pierce Co. He built five steam cars in competition with David Ferguson, the present designer of the Pierce Great Arrow, and in a test of one year the gasoline car won out against steam and Mr. Nickerson immediately turned his attention to gasoline carriages and has been following up that line ever since.

DETROIT RATES ITSELF HIGH AUTOICALLY.

DETROIT, MICH., April 1.—Detroit is far from being a cheap town when anything in the automobile line is at stake. She may not warm up to general sport as do some of the other large American cities, but when it comes to anything in the auto line Detroit enthusiasts are always there. This was evidenced by the large crowds which turned out during show week, in spite of the fact that the ante had been raised from two bits to half a cart wheel. While afternoon attendances were scarcely as large as those of last year, the evening throngs made up for the deficiency. If further proof is needed to show that Detroit is there on the automobile stuff, a little reflection on the vast number that flocked east to the Vanderbilt cup race, and again to the New York and Chicago shows, should convince.

A NATIONAL FEDERATION OF CHAUFFEURS.

LOUISVILLE, KY., April 1.—Through a special delegation from the Chauffeurs' League of Louisville to the Chauffeurs' League of Chicago arrangements were made for the organization of a National Federation of Chauffeurs' Leagues, with Louisville as the headquarters of the movement. The Executive Committee has decided to hold the national convention of chauffeurs in New York City during show week next winter.

SIMPLICITY OF ATLAS TWO-CYCLE RUNABOUT

A PART from the very prominent part that the automobile played during the course of the San Francisco fire and directly after it, the latter disaster was one that in turn was responsible for a development in the automobile industry. For four years preceding the combination of earthquake and con-

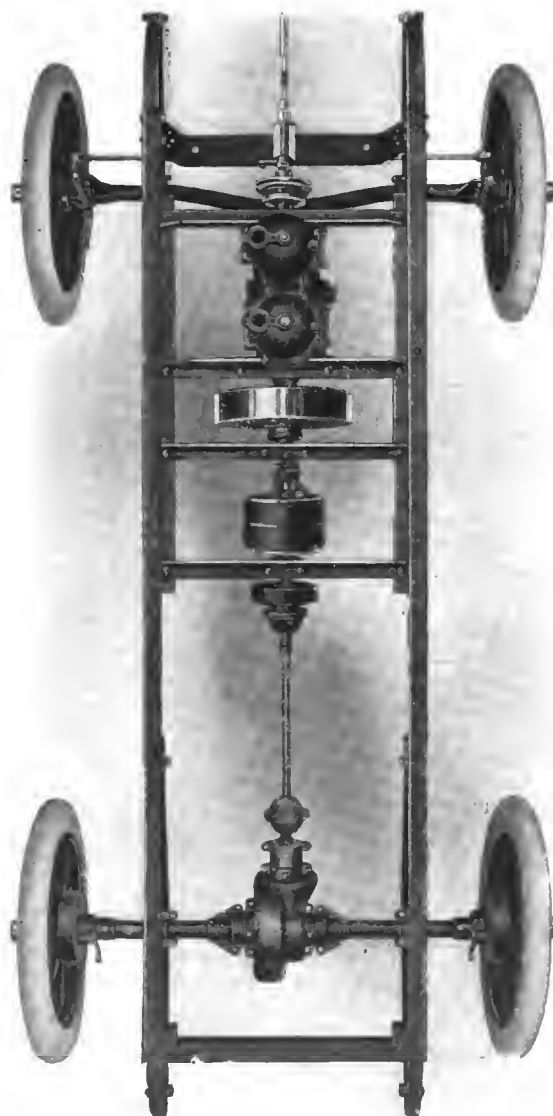
ward and reverse, and the bevel drive and differential on the rear axle being the only mechanism visible on the entire chassis. With but five moving parts, the motor is extremely quiet and smooth-running. Particular attention has been paid in the design of the motor to making every moving part as free from the necessity of adjustment as is possible, so that the motor seldom has to be dismantled, though this is a very simple operation. The crankshaft journals are case-hardened, ground and polished, bronze bearings being employed—a combination that will run for a long while with no perceptible wear. The construction of the crankcase permits of making it air-tight, without the use of stuffing boxes, which is an important advantage in this type of engine. The motor's speed range is from 100 to 2,000 r. p. m. and the transfer of the charge to the combustion chamber is so perfectly



COMPONENT PARTS OF THE ATLAS MOTOR.

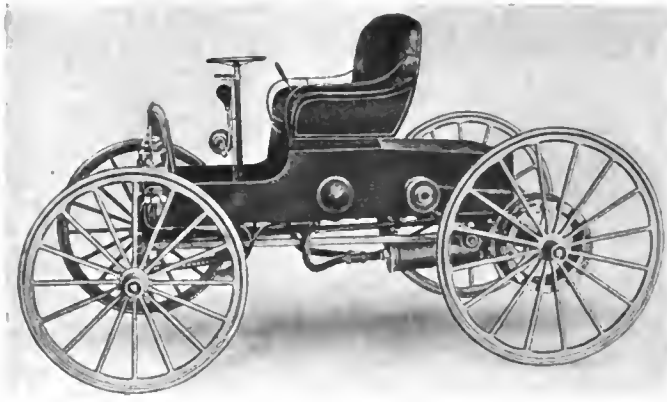
flagration that all but wiped the Pacific Coast city off the map temporarily, the Sunset Automobile Company of San Francisco were building a successful little car with a two-cylinder, two-cycle engine under the same title as that of the company—the Sunset. But the fire wiped out the company's plant and its misfortune led to the acquirement of the right to manufacture the car, besides obtaining the services of its designer, Dorville Libby, Jr., by the Atlas Motor Truck Company, of Springfield, Mass. Prior to this, however, the latter concern had put the Atlas motor to the test during a period of eighteen months and accordingly knew exactly what its capabilities were.

The little car was shown publicly in the East for the first time at the show in the Grand Central Palace in December last, where it attracted considerable favorable comment, as did also the huge commercial trucks shown together with it and using the same type of motor. The extreme simplicity of the latter, which means primarily the small number of its components, and particularly small ones that are conspicuous by their absence, may be taken in at a glance upon reference to the accompanying illustration of the complete power plant dismantled, showing its make-up. The latter consists of the one-piece crankcase, the crankshaft, cylinder castings, pistons, piston rings, connecting rods and wristpins, this practically completing the inventory. It may readily be imagined that, starting with a motor as simple as this, the designer would make every effort to carry out the same idea in the remainder of the car, and such has been the case. To realize the extent to which he has succeeded in doing this it is only necessary to glance at the plan view of the chassis as presented in connection with that of the motor. It would be difficult to conceive of anything simpler than this. The motor—disproportionately small by comparison with others of its power—the flywheel, change-speed gear of the planetary type, giving two speeds for-



ATLAS CHASSIS AS SEEN FROM ABOVE.

accomplished that a remarkable increase of speed may be obtained merely by advancing the time of ignition. This makes the motor very flexible and gives a wide range of speed to the car without the necessity of dropping to the low, the use of which is mainly confined to getting under way.

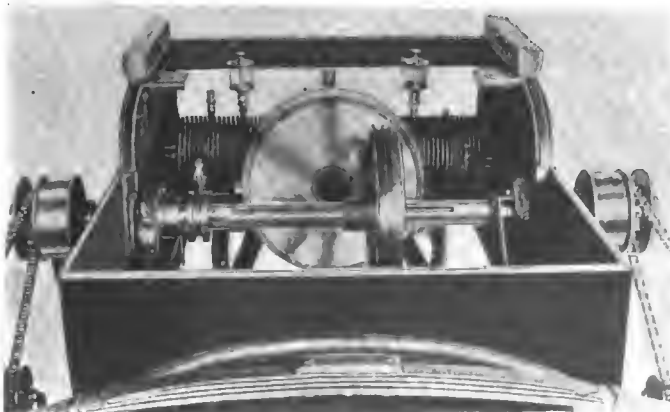


A STURDY REPRESENTATIVE OF THE POPULAR AUTO.

DETAILS OF THE HATFIELD BUGGYABOUT.

On reviewing the specifications of the Hatfield Buggyabout there can be no doubt that its designer has reduced the automobile to its very lowest terms where fewness of parts and liability to accident is concerned. It could not possibly have less, and still constitute an efficient self-propelled vehicle. The details of the entire power plant may be taken in at a glance as pictured in the accompanying illustration. A double-opposed horizontal, four-cycle, air-cooled motor rated at 12 horsepower is placed transversely across the body under the seat, but is so located as to be very accessible in every part. The flywheel is at the rear and its smooth face is designed as one of the members of the friction type of transmission employed. The friction member of the latter is carried on a substantial countershaft supported by liberally proportioned bearings and is arranged to slide back and forth on this shaft on large keyways. In fact, all the parts are designed to withstand the hardest kind of usage and are constructed of materials insuring long service.

No clutch or other disconnecting device is employed, the transmission being further simplified by its elimination. A differentially acting reverse sprocket on which the builders hold patents is placed at each end of the countershaft. This is a simple and positive ratchet device driving in either direction according to the direction of rotation of the friction member. The motor control is sensitive and permits of a considerable range of speed without resorting to a change in the position of the drive. In connection with both the suspension of the body and the chains, there is fitted the Hatfield shock absorber, which performs the offices of dampening the jolts and automatically keeping the chains taut as well as in the correct alignment at all times. Wheel steer, mounted on a vertical steering column, is employed. At its lower end the column carries a pinion engaging a semi-circular rack, to the ends of which the front axle is attached—a type of steering gear made familiar by years of use on fire apparatus.



SIMPLICITY OF THE "WORKS" OF THE HATFIELD.

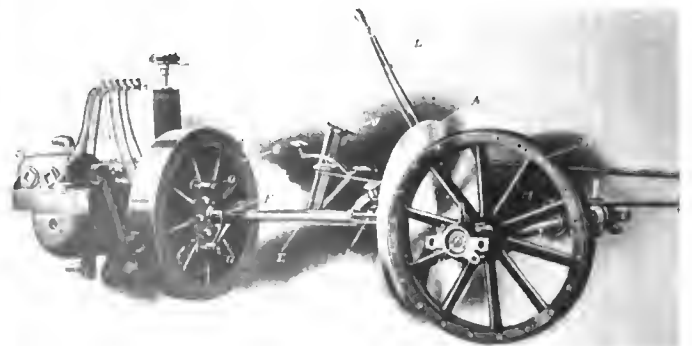


HANDY AND EFFICIENT 1,000-POUND DELIVERY WAGON.

THE CARTERCAR COMMERCIAL VEHICLE.

Upon the same chassis which serves as the foundation of the runabout, folding tonneau and regulation touring types of the Cartercar, the builders of the latter have, for some time past, been specializing a medium capacity delivery vehicle. That the former lends itself admirably to the requirements of such service is evident from the size of the body that may be used as well as the convenient placing of the power-plant, which in no way interferes with the disposition of the load carried and permits of reaching every part of the mechanism without trouble when the body is full.

This wagon has an effective carrying capacity of 1,000 pounds, and is equipped with the 20-24-horsepower, two-cylinder, horizontal-opposed motor placed transversely on the forward end of the frame under the bonnet, the same as the regulation pleasure cars of this make. All the small parts of the motor mechanism are placed on top of the latter, making them easily accessible. The well-known type of friction disk drive specialized on cars of this make is employed, the shaft carrying the friction disk being attached directly to the motor flywheel, thus eliminating the usual clutch, while the drive itself does away with a change-speed gear box and its troubles. As will be evident from the illustration at the foot of the column which pictures the power plant and transmission complete, the countershaft carries a spoke wheel the periphery of which is shod with the friction surface to engage the large revolving disk against which it is pressed. The relative positions of the two by means of which a wide range of speed is obtained in either direction, are changed with the hand lever shown. This single lever gives all the gradations from zero to the highest speed as well as the reverse, which is also utilized when occasion requires as a brake, in which rôle it is said to be extremely effective and sensitive. On the whole, the car is very simple and efficient, which means reliability and freedom from accident in inexperienced hands.



COMPLETE POWER PLANT AND TRANSMISSION OF CARTERCAR.

FOR AND ABOUT THE GRAND PRIX

PARIS, March 26.—There is bustling activity both at the Automobile Club of France and in the reserved quarters of the different factories where racers are being built for the Grand Prix. The Sporting Commission, which is supreme authority in all that concerns the French club's speed contests, has definitely decided not to construct a banked turn at the Dieppe corner of the circuit. At this point the road is V-shaped, the angle of the V pointing towards Dieppe. A building stands on the edge of the turn, on the inner side of the circuit, and to avoid this difficult corner altogether it was proposed to make a special wood track, joining up the two arms about fifty yards from the fork. The cost would have been about \$3,000. After much consideration, the Sporting Commission has decided that it would not be advisable to turn the circuit into an artificial racing track. Banked up, the turn could have been negotiated at sixty miles an hour; in its natural condition it will have to be tackled at a very slow speed.

The main grand stand and the press stand will be built between the main road and the side track on which will be established the tire and gasoline stations, and from which the Sporting Commission Cup racers will be started. They will thus be on a kind of island, for the loop track will be as rigorously closed to the public as the main course. A tunnel will give communication with the outside of the circuit. Opposite the stands will be very large scoring boards, placed obliquely so as to be visible from all the stands. A new feature will be the placing of Venetian masts at regular intervals along the road in view of the grandstand, to allow the public to calculate the speed of the competitors as they rush by on the fastest stretch.

Darracq Engages Caillois as Race Driver.

Gustave Caillois, who is well known in America on account of his connection with the Thomas firm in the last Vanderbilt Cup race, has signed an engagement with the Darracq Company to drive in all the principal events of the year, and will doubtless represent that firm, together with Wagner and Hanriot, in the Grand Prix. Caillois has long been recognized as one of the most skillful drivers that France possesses, but it is in connec-

tion with the famous Brasier team of the last two Gordon Bennett races that he is best known to the public. Only a few weeks ago he severed his connection with the Thomas company.

Training on the circuit is a daily affair, Albert Clement and Garcedt on Bayard-Clement racers being particularly active. Stricker, who will have charge of the Porthos racer, has set out for a run to Rome and back as a preliminary training. Two of the three Renault racers intended for the Grand Prix are now ready and will make their first run on the Dieppe circuit before the end of the week. As last year, Szisz will be the head of the racing team. The machines will be given a preliminary tryout of about three days.

Two of the three motors which will drive the Panhard-Levassor racers will be tried out on the *Panhard-Tellier* and the *Rapière*, two of the motor boats taking part in the Monaco meeting to open on April 1. As soon as the motor boat races are over, the engines will be put on the chassis now being built and prepared for the 30-liter road race.

Lorraine-Dietrich is building three distinct classes of racers this season. Two are for the Targa Florio, two for the German Emperor's Cup race and three for the Grand Prix. The lack of uniformity in European races makes this multiplicity necessary.

ARDENNES RACE UNDER NEW CONDITIONS.

BRUSSELS, March 27.—The Automobile Club of Belgium has abolished the old weight limit for the Ardennes race to be run on July 22 on a 53.2 miles circuit, starting from Bastogne, to be covered seven times, giving a total of about 372 miles. New conditions are: Cylinder capacity, 8 liters; minimum weight, 2,585 pounds, including racing body and tires, but without tools and spare parts. Gasoline of 690 degrees will be furnished by the racing board. Dismountable rims can be used. There will be no controls; each firm may establish its own tire and spare parts stations. Three machines may be entered from any factory at a cost of \$500 each up to May 15 and \$800 until July 1. Starts will be given at intervals of one minute from 6 A. M. No European race is now run under the old 1,000 kilos weight limit.

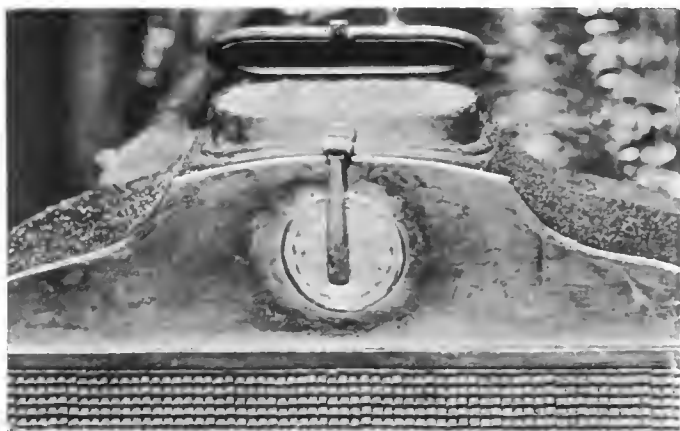
THE 1907 SALON DE L'AUTOMOBILE

THE first auto show ever held in France, or, more correctly, the first exhibition at which automobiles were exposed, was opened by the President of the Republic at the Palais de l'Industrie, Paris, in December, 1895. The first automobile Salon to be organized by the Automobile Club of France was housed under tents in the Tuileries Garden, in June, 1898. The one to be held this year is thus the tenth in an uninterrupted line of succession. Each year the Paris Salon has become more and more brilliant, and during the last two years has been, without a doubt, the largest, most artistic and most luxuriously decorated of any trade show in the world. The next show, to be held during November and December, will be a decennial worthy of the national industry. Although yet far in the future, Gustave Rives is at work on the great event and has already published the detail regulations. The show will last twenty days instead of fifteen as in recent years.

The 1907 Salon will be held as usual in the Grand Palais, with a temporary building, probably on the Esplanade des Invalides, for the commercial vehicles, machine tools and motor boats. The Avenue des Champs-Élysées, the Place de la Concorde, including the Automobile Club of France, the Alexandre III bridge, the Esplanade des Invalides and the Place de l'Étoile will all be brilliantly illuminated. These avenues and squares comprise the

finest that Paris possesses and will be illuminated in a manner that has not been equaled since the visit of the Russian Emperor to Paris on the occasion of the inauguration of the Alexandre III bridge across the Seine. The exhibition, in fact, will be a huge national automobile demonstration.

Request for exhibiton space in the Paris Salon must be made not later than August 15. Positions will be granted by the drawing of lots on September 1. Requests for show space received after August 15 will only be considered if any space is available after satisfying early entrants. Following a now established custom, a central portion of the hall will be reserved to a limited number of the oldest and most important French houses. The central stands will have a maximum area of 80 meters, at a rental of \$2,000. Other stands on the ground floor vary in price from \$20 to \$5 per meter, according to position. Space in the galleries will cost four or five dollars a meter, according to position. These prices are for bare floor space, and include neither flooring nor carpets. Each stand must be decorated at the cost of the exhibitor to harmonize with the general decorative scheme of the hall and subject to the approval of the committee. Many of the stands will be marvelous examples of illuminated wrought-iron work, costing amounts frequently double the price of the high rental.



OBLONG FILLER OPENING ON THE B-L-M TANK.

LITTLE THINGS THAT SOMETIMES LOOK BIG.

Little things have the power of making life either a burden or a pleasure, and this is true in automobiling as well as in other pursuits. Many automobile manufacturers show a keen appreciation of the fact in the minor improvements made about their machines. An example is seen in the B-L-M starting crank and the radiator filling cap, both of which are here illustrated.

The crank is so arranged that though it is a fixture in so far as it cannot be taken from the car, it is held flat against the radiator when not in use, instead of projecting threateningly forward like the ordinary fixed crank. The crank turns in a sleeve which is so pivoted that it can swing vertically, carrying the crank with it. The crank has a longitudinal sliding movement in the sleeve, so that when the latter is brought to a horizontal position, in line with the crankshaft of the motor, the crank can be pushed toward and into engagement with the motor shaft. A pin holds it in this position, as if it were a fixed crank, though the usual pin-and-notch arrangement is provided to prevent the crank being carried around by the shaft after the motor has started. When the motor has picked up and the crank is no longer required, it is first slid out of engagement by drawing it away from the crankshaft, when it can be swung up flat against the radiator, the swiveled sleeve holding it and preventing its removal from the car. A pair of brackets with deep notches into which pins on the crank are allowed to drop, holds the crank in the position shown in cut.



B-L-M 24-HORSEPOWER TOURING CAR.
Showing folding crank turned up against the radiator when not in use.

It is no joke to try to pour a bucket of water into a small round hole at the top of a radiator, not only is the process slow and bothersome, but water is often slopped over the ignition apparatus, causing short-circuits. The B-L-M filler is a generous oblong opening that will easily swallow the wide, thin stream of water poured from a bucket without slopping or loss of time. A heavy brass cover, fitted with a gasket to prevent leakage, is held down when closed by a single lever which turns down over the cover, pressing down a cam on a lug on the edge of the cover and firmly closing the opening. It is the work of but an instant to open and close this filler, and there are no threads to stick or refuse to catch and no loose top to get lost—or to drop suddenly when found to be unexpectedly hot.

LOCOMOBILE PROMINENT AS NEWS DELIVERER.

It seems fitting that the Locomobile should be one of the first gasoline cars to be identified with the rôle of newspaper delivery wagons in this city, as it was in a former incarnation—the little "teakettles" of several years ago that the steam cars of the same name first usurped the place of the madly tearing horses and equally wild drivers intent upon delivering extras and early



BROOKLYN "EAGLE'S" NEW LOCOMOBILE DELIVERY CAR.

editions who have so long been a feature of metropolitan life, and one that is dreaded by the pedestrian. The accompanying photograph shows the modern successor of the little steam wagons. It is a 22-horsepower Locomobile chassis of the model of 1907 fitted with a special body by the I. S. Remsen Manufacturing Company, of Brooklyn, and is employed in the service of the Brooklyn *Eagle*. The car is said to do splendid work in its new field, as well it may, and will doubtless prove to be the forerunner of many others for similar work.

USED A CIDER KEG AS A COOLING SYSTEM.

That there are many things which may happen to a car without putting it out of commission if a little ingenuity be exercised, was well proven by a rural autoist in Michigan during one of the cold snaps of the past winter. He was located eight miles from the nearest repair shop and one night the radiator of his car froze solid. He wished to use it the next morning, but did not care to run the risk of increasing the damage, so he rigged up a home-made cooling system. A cider keg full of water was placed on one of the front seats and a piece of garden hose led from it to the cold water intake of the cylinder jackets. The drain cocks of the latter were opened sufficiently to let the water drip out of them fast enough to keep the engine cool, so that the trip was made successfully, and another "useful hint" added to the breviary of the automobilist.

PROSPECTS FOR TRADE IN RUSSIA.

Commercial vehicles are likely to meet with much success and motor boats might be extensively employed on Russia's vast river system. All the difficulties incidental to the establishment of a new industry will be felt by pioneer automobilists in Russia; in addition, the customs authorities do not facilitate matters, and free circulation either within the country or about the frontiers is not always possible.

Notwithstanding, European manufacturers are resolved to do business in Russia. French firms already having agencies in that country are Darracq, Renault Freres, Bayard-Clément, and Chenard & Walcker. Oldsmobile is, we believe, the only American firm which has attempted to trade with Russia. In view of the low temperature prevailing for the greater part of the year, air-cooled cars are likely to meet with special favor, and it is here that American manufacturers might steal a march on European builders. In addition to the firms already having agencies, the following important houses have decided to exhibit at the St. Petersburg show: French, Lorraine-Dietrich, C. G. V., Mendelssohn, Panhard-Levassor, Delaunay-Belleville, Berliet, Mors, Sizaire & Naudin, Cotton-Desgouttes, Labourdette; Belgian, Minerva and Franeau; Italian, Fiat, Bianchi, Standard and Turckheimer; German, Mercedes and Adler.



SERVITOR RUNABOUT, 20-H.P. AND AIR COOLED

ATTRACTIVE NEWCOMER FROM SANDUSKY, O.

Under the title of the "Servitor," the Barnes Manufacturing Company, 1400 Columbus avenue, Sandusky, O., are placing on the market an attractive runabout of the speedy type which combines a number of novel and commendable features. Taking as its motto "A car for service," its designers have striven to eliminate every feature that could possibly tend to reduce the factor of reliability in service and have succeeded in producing a car which should ably substantiate its apt title. For instance, its 20-horsepower engine is air-cooled, thus relieving it of considerable of the usual burden, while the gearless transmission is employed, thus making the car extremely simple to operate and with no risk of damaging it on the part of an inexperienced driver. The foundation of the chassis consists of a pressed steel frame of standard channel section, mounted on well-proportioned semi-elliptical springs front and rear. Drive is by means of propeller shaft and bevel gearing to the live rear axle. A round bonnet shelters the motor and its lines blend well with those of the two-seated body finished in red upholstery, the shape of the mud guards also being made to harmonize.

PETROLEUM ENGINES FOR THE FRENCH NAVY.

For some time a Commission appointed by the French Government have been inquiring into the question of the possible use of petroleum engines in the French Navy, says *Engineering*. After completion of their tests, the Commission have recommended the adoption of the Cazès and the Mietz and Weiss systems and the sets of engines on which the tests were made have been purchased by the Government.



MORS 17-HORSEPOWER CARRIAGE FOR TOWN USE.

AN AUTO FOR TOWN SERVICE.

King Edward of England has added to his automobile "stable" one of the new 17-horsepower Mors town carriages, with motor under the seat. Automobiles specially designed for town service were a special feature of the last Paris salon, and among the many excellent chassis exposed the Mors occupied a high position. King Edward was so pleased with this little machine that he purchased it on the spot, declaring that the fittings and upholstery were all that he could desire. One of the distinctive features of this machine is the ease with which it can be turned in the narrowest of streets and in the most crowded thoroughfares. Cryder & Company, American agents for the Mors, Broadway and 63d street, New York City, state that society leaders here are placing numerous orders for this type of the Mors for town use.

A MICHIGAN AUTO CITY THAT THRIVES.

PONTIAC, MICH., April 1.—In three short years our automobile industry of Pontiac has sprung from nothing to a point where 400 men are now employed, and with the completion of additions to the two auto plants here the number of workmen will be increased at least fifty per cent. The two plants here are those of the Rapid Motor Vehicle Company and the Welch Motor Car Company. The Rapid Motor Vehicle Company, which a year ago moved into its new building, now has plans for an addition, 60x150 feet in size and two stories high.



FRANKLIN TYPE J TRUCK AND ITS BIG LOAD.

This is the car on which the H. H. Franklin Mfg. Co. has been giving the worm-gear drive a most severe test. The tire chains prove very efficacious on the slippery street.

BUSY AUTO CLUBS AND THEIR DOINGS

Quaker City Motor Club Climb Will Be Held on May 30.

PHILADELPHIA, April 1.—The active season of the Quaker City Motor Club will be inaugurated a fortnight earlier than intended in response to the demands of charity. The Ladies' Aid Committee of the Pennsylvania Epileptic Hospital and Colony Farm asked the club to assist at a motor carnival at the Belmont track on Saturday, May 18, and the board of governors decided to accept. The contest committee is already at work on the details of a program including many novelties in addition to the regular speed events. The exact course over which the hill climb will be run has not yet been decided upon, but the contest committee has decided to adhere to its original intention of running off the event on Memorial Day. This action definitely bars City Line Hill from the list of probabilities, the combined opposition of the G. A. R. Veterans, the cemeteries and the horsemen having been too bitter to overcome.



COVER OF MENU CARD USED AT BANQUET OF THE ROCHESTER AUTOMOBILE CLUB, MARCH 25.

How Drought, of Milwaukee Club, Increased Speed Limit.

MADISON, Wis., April 1.—Giving legislators free rides in automobiles has resulted in the killing of a bill in the Legislature regulating the speed in cities to six miles an hour and in the country to eight miles.

James Drought was sent to Madison by the Milwaukee Automobile Club to induce the legislators to take rides and then demonstrate different speeds. They were taken for rides about the city and out in the country. As a result all stringent laws regulating the speed in the country to less than ten miles will be killed. Assemblymen believe fifteen miles would be about right.

Washington Club on Maryland Law Violations.

WASHINGTON, D. C., April 1.—A special meeting of the Automobile Club of Washington was held March 28 for the purpose of taking some action with reference to the constant violation of the speed laws of Glen Echo, Md., located on the Conduit road.

The meeting was largely attended, and while the sentiment was unanimously in favor of upholding the Glen Echo authorities in curbing the speed mania now so much in evidence on the Conduit road, it was equally unanimous against Charles Collins, Glen Echo's Town Marshal, who makes life a burden for the automobilists, whether they violate the law or not.

Chairman Miles Makes Earnest Appeal for the Orphans.

NEW YORK, April 1.—June 12, the National Orphans' Day instituted by the A. A. A., has been fixed by the New York Motor Club as the day when the children of the orphan asylums of the city will be given their annual outing. For the past two years the club has successfully carried out this excellent work and has brought an immeasurable amount of happiness to the little ones. The third event, it is hoped, will be larger and more successful than any of its predecessors. No expense or trouble will be spared by the club to make it so, and if owners of automobiles accord the support which the object deserves it will certainly be a huge success. S. A. Miles, chairman of the Orphans' Day committee, has received offers of a number of cars, but still more are required. Two hundred and fifty automobiles could easily be filled, and Mr. Miles has made an earnest appeal to owners to lend their machines and drivers on June 12. The claims of the orphans only need to be mentioned for true-hearted men to respond willingly and generously.

South Bend Enthuses Over Indiana State Body.

SOUTH BEND, IND., April 2.—The South Bend Automobile Club will take an active part in the formation of the Indiana State Association through its president, John J. McErlain. Since the A. A. A. renewed talking of organizing State bodies throughout the country and Secretary Elliott of the national organization wrote E. C. Briggs of South Bend, telling him of the intention to form a State association in Indiana, there has been an increase in local interest in autoing, and the South Bend club has taken the initiative in bringing about a State association.

The local club will hold a big meeting about April 15, and will at that time outline plans for an extensive campaign. Owing to the many new automobile owners there will be an enlarged membership this season. The matter of local interest in the A. A. A. tour has been turned over by the club to the Tincer Motor Car Company of this city. A canvass of the members of the local organization will be made to get their wishes in the matter, after which a report will be made to the A. A. A.

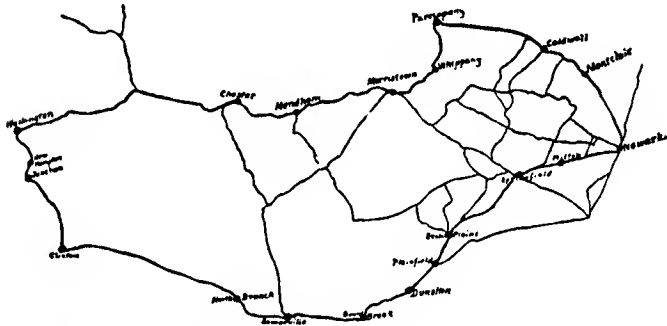
Rules Adopted for the New Jersey Endurance Run.

NEWARK, N. J., April 1.—Practically all arrangements for the three-day endurance run of the New Jersey Automobile and Motor Club have been completed. The contest will be held May 30 to June 1, is primarily for the purpose of demonstrating the powers of endurance of automobiles, and is open only to members of the New Jersey Automobile and Motor Club. As will be seen by the accompanying maps, the route will be entirely over New Jersey roads and will closely approximate conditions that are met with in touring. Two classes of cars will be scheduled, touring and runabout, and to the winner of the first class will be awarded the Shanley trophy—to the winner of the last mentioned class the Sinclair trophy.

One of the most stringent rules relates to official observers, and states that every vehicle shall carry an official observer, for whom a front seat shall be reserved, and cars shall be under observation continuously, from the time of the start until the close of the contest, either by the observers on the car or the person or persons in charge of the garages. Entrants must nominate one observer in respect to each car entered by them. The name of such observer must be submitted at the time the entry is made. No observer shall act as such upon the car of his nominator, and the committee reserves the right to reject any nominee without giving reasons therefor. Each observer will, so far as practicable, be placed on a different vehicle each day. He must not in any way assist drivers or cars; for instance, he must not turn on

lubricators or perform any functions, however small, in connection with the car. He must not even assist drivers with suggestions as to what to do in case of trouble.

Competing cars must carry a full complement of passengers of an average weight of 125 pounds each, and competitors must



FIRST DAY'S ROUTE OF THE NEW JERSEY ENDURANCE RUN.

conform strictly to traffic regulations and speed laws as provided by the statutes of the State of New Jersey. No stop of a car for repairs or other cause can be made without penalization, save in the event of tire trouble, and competitors on entering assume entire responsibility for their respective cars and the damage which may be done to them during the run.

In the matter of penalization cars must adhere to schedule within five minutes either way to avoid it. The penalizations are points per minute or fractions thereof for the following:

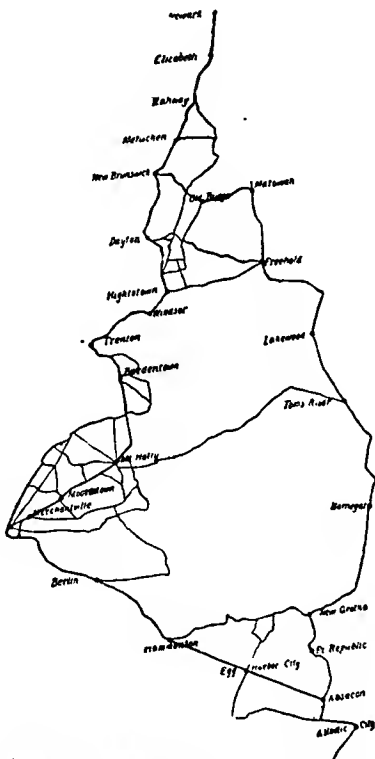
Points per Minute.

- To arrive at any control more than five minutes before or after schedule time 2
To stop car or motor between controls without making repairs or adjustments 3
To stop car or motor to make repairs, adjustments or replacements 2
To make repairs or replacements without stopping motor 1

To have one or more persons render assistance in any way, the time of such person or persons will be charged at double the rate as, and in addition to, that charged against the driver. No penalty will be noted against puncture of tires, but if a puncture occur and the car does not arrive at the control within the prescribed time, points will be scored against the car, as above, for each minute late.

No record will be kept of the amount of oil or gasoline used, but neither must be put into the tanks unless under the supervision of the observer, and then only while a car is in a control.

Entries must be filed with fees on or before the hour of 6 P.M., Wednesday, May 22, with Secretary H. A. Bonnell, 1034 Broad street, Newark, N. J. W. C. Shanley, donor of the trophy for touring cars, will officiate as referee.



SECOND AND THIRD DAYS' ROUTE.

THE AUTOMOBILE CALENDAR.

AMERICAN.

Shows.

- April 6-13.....—Montreal, Canada, Second International Automobile and Sportsman's Exhibition. R. M. Jaffray, manager, 309 W. Notre Dame street.
April 8-13.....—Pittsburg, Pa., First Annual Show of the Pittsburg Automobile Dealers' Association, Duquesne Garden.
April 11-13.....—Denver, Col., Automobile Show, Coliseum Hall, G. A. Wahlgreen, manager.
Oct. 31-Nov. 7..—New York City, Madison Square Garden, Eighth Annual Automobile Show, Association of Licensed Automobile Manufacturers.
Nov. 30-Dec. 7..—Chicago, Coliseum and First Regt. Armory, Eighth Annual National Automobile Show, National Association of Automobile Manufacturers.

Races, Hill-Climbs, etc.

- May 6-7.....—Harrisburg, Pa., Two-day Endurance Run, Motor Club of Harrisburg.
May 30.....—Philadelphia, Hill Climb, Quaker City Motor Club.
May 30.....—Chicago, Memorial Day Race Meet of the Chicago Motor Club.
May 30-June 1..—Newark, N. J., Three-day Endurance Run of the New Jersey Automobile and Motor Club.
June 12.....—National Orphans' Day, instituted by the American Automobile Association.
July 10.....—Cleveland, O., Start of Fourth Annual Tour of the American Automobile Association, for the Golden Trophy. Finishes in New York City on or about July 23.
Oct. 19.....—St. Louis, Mo., International Aerial Race of the Gordon Bennett Prize. Aero Club of America.

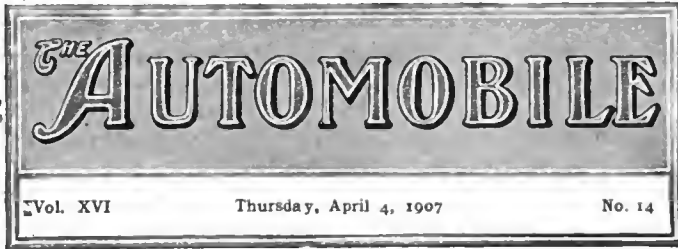
FOREIGN.

Shows.

- April 6-13.....—London, Agricultural Hall Motor Show.
May 4-15.....—Madrid, Spain, Automobile Exhibition, Palace of Fine Arts, Royal Automobile Club of Madrid.
May 16-26.....—Zurich, Third Annual Swiss Automobile Show.
June 25-30.....—St. Petersburg, Russia, Automobile Show.

Races, Hill-Climbs, etc.

- April 1-16.....—Spring Wheel Competition, A. C. of France.
April 18.....—Paris, La Coupe des Voiturettes, A. C. of France.
April 21.....—Targa Florio Tour (Sicily), Auto Club of Milan.
April 25-28.....—Touring Contest, Automobile Club of Touraine.
April 28.....—Chateau Thierry Hill Climb.
May 16-31.....—Belgium, Industrial Vehicle Trials, Automobile Club du Nord.
May 18-21.....—Milan, Italy, Touring Club Trials.
May 22-25.....—Irish Automobile Club Reliability Trials.
May 24-27.....—Voiturette Contest, Automobile Club of Austria.
May 28.....—Isle of Man, Tourist Trophy Race, Automobile Club of Great Britain and Ireland.
May 30.....—Isle of Man, Heavy Touring Car Race, Automobile Club of Great Britain and Ireland.
June 3-12.....—Paris, Electric Vehicle Competition, Automobile Club of France.
June 3-12.....—Herkomer Cup, Automobile Club of Bavaria.
June 14.....—German Emperor's Cup, Taunus Circuit, Imperial Automobile Club.
June 20-22.....—American Gold Cup, Start from New York of European Tour for American Cars, Georges Dupuy, secretary, 1402 Broadway, New York City.
June 14-29.....—Scottish Reliability Trial, Scottish Automobile Club.
July 2.....—Grand Prix, Automobile Club of France.
July 14, 1908....—Paris to London, Aerial Race.
July 15-18.....—Ostend Week, Record Trials, Automobile Club of Belgium.
July 21.....—Ardenne Circuit (Belgium).
July 31.....—Liedekerke Cup for Touring Cars, Ardenne Circuit, Belgium.
July 31-Aug. 8..—Belgium Regularity Contest for Touring Cars. A. C. of Belgium.
August 1-7.....—Criterium of France, 1,750 Miles Touring Competition and 250-mile race for the Press Cup. A. C. of France.
August 11-29....—France, Coupe de Auvergne.
Sept. 1.....—Italy, Brescia Circuit, Florio Cup. A. C. of Italy.



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Concerning Letters Inter-esting and Instructive. Some of the letters we have received recently for publication under the caption of "Letters Interesting and Instructive" make this a fitting opportunity to comment on the widespread interest this department of THE AUTOMOBILE has been instrumental in arousing on the part of autoists all over the country. Every enthusiastic owner who has the time and opportunity is desirous of mastering his car, but there are many, many things that are only to be learned by traveling the hard road of experience, and help in solving the problems as they come along is naturally much sought after. But there are so many different makes of cars, each with its own peculiarities, that it would be next to impossible to have a knowledge of all of them, and while we endeavor to aid in the solution of every problem that arises, there are naturally frequent occasions when only the man who has an intimate acquaintance with the particular car in question can come to the rescue. Here then is the subscriber's opportunity to benefit himself, and doubtless others in the same predicament, and it is certainly encouraging to note how frequently this is the case through the medium of our correspondence clearing house. Occasionally a reader will take us to task under the impression that we are attempting to pose as infallible oracles in all things automobile. We are not only willing but anxious to be shown so that we can help the next fellow, so that this calls for no comment on our part. Whenever you are in need of information or help in solving a knotty one, write to the editor, and, if in our power, we will try to make things clear; if not, numbers of our subscribers will come to the rescue.

To Be No Dearth of Interesting Competitions. Judging from present indications, few years have opened with better prospects of the holding of a number of interesting contests than the present. Realizing the shortcomings of the 1906 A. A. A. Tour rules, the conditions have been revised in a manner that should be productive of an event far more interesting and instructive than either of its predecessors. Instead of the wild cross-country dash under conditions that savored more of the transfer of an army from one part of the country to another in time of war, rather than a peaceful cavalcade bent mainly on pleasure, there will doubtless be a "touring" contest as near to the realization of the meaning of that term as it is possible to approach under the circumstances.

Where the racing end is concerned, there is little doubt but that what has come to be more generally known as the American automobile derby—the Vanderbilt Cup race—will, under the new conditions imposed, or rather granted, by the use of a restricted road upon which to run it, be an event of far greater interest than was possible under the restrictions necessarily adhered to as closely as possible in former years. Every assurance is forthcoming that, shortly after this, there will be run off, on the same course, a contest for American supremacy that will be of even more vital interest to the American builder than the international event that precedes it. These three, supplemented by numerous club events of a similar nature, should leave little to be desired in the shape of touring and racing competition during the coming season.



Duplicating the Ignition System Finds Favor. Time was when not alone the average autoist, but also the supposedly well-informed designer and manufacturer looked askance at any suggestion of the magneto, and that was not long ago either. Considered from one point of view, there has been little if any change in ignition systems generally during the interim, though in another sense there has been somewhat of a revolution. In other words, there has been no radical change in the appliances and apparatus employed to generate or utilize the electric current for ignition, but there has been an almost complete reversal in the status of the different systems. Taking into consideration current practice as represented by American makers alone, there were but few advocates of the low-tension system of ignition in this country a few years ago; there were even fewer who were disposed to look favorably upon the magneto of either type.

To those who are familiar with this essential as represented on the up-to-date American car, it is hardly necessary to comment at length on the change that has come about since then. During the interval both the accumulator and the magneto have been developed to an unthought-of extent, and the fact has been recognized that regardless of the perfection to which a system may be brought, the best factor of safety is duplication. If any one had had the temerity in 1903 or 1904 to venture the assertion that within a year or two, cars employing both the low and high-tension systems of ignition would be built, he would have immediately been classed as a "revolutionary," meaning one of that type of inventors the product of whose genius is bound to sweep away all existing efforts—in his own opinion.

Regarding the matter of providing an adequate factor of safety, the former "reserve" set of dry cells has undergone a process of evolution which has not stopped short of duplicating the entire system, the most striking examples of this being the use of two totally different systems as just referred to. Two sets of dry cells, an accumulator and dry cells, two sets of accumulators, magneto and accumulator and low tension magneto system and high-tension accumulator system would appear to aptly represent the steps that this essential has undergone in the past few years. In that time, reliability has been made an equally prominent characteristic of this as of other parts of the car, but experience has demonstrated that duplication is excellent insurance.

A. C. A.-A. M. C. M. A. SHOW TO BE EARLY.

As might be expected, the question of the New York show and the plans for the proposed Society of American Motor Car Engineers with the laboratory idea included, occupied most of the time at the Committee of Management meeting of the American Motor Car Manufacturers' Association, held at the New York City headquarters on Friday of last week.

It was announced that definite arrangements had been made with the Automobile Club of America, and the two organizations will work together on the show this fall, to be held as usual in Grand Central Palace. It was agreed that an earlier date than the December one of last year would be best, but no definite time has been decided upon. There are some good reasons for a show following the one at the Garden, coming between it and the Chicago affair, and there are some who think an affair at the same time as the Garden show would have many advantages. The matter will be taken up with all the members of the Association.

Proposals for the testing laboratory planned by the Association were received, but until further investigation nothing will be decided upon in that direction. The officials of the Association wish to investigate thoroughly the requirements of such a laboratory before coming to a decision.

A number of applications for membership were announced by the Membership Committee and will be subjected to the vote of the members.

There was a general discussion over the benefits of the proposed central bureau of good roads which the Association has voted to support both morally and financially.

The remainder of the day was taken up with routine matters. The new Show Committee which is to work with the Automobile Club of America on the show in the fall, consists of H. O. Smith, chairman; William Mitchell Lewis, and J. B. Bartholomew.

In attendance at the meeting were: Benjamin Briscoe, chairman, Maxwell-Briscoe Motor Company; Charles Lewis, Jackson Automobile Company; H. C. Smith, Premier Motor Manufacturing Company; E. F. Peer, Reo Motor Car Company; C. C. Hanch, Nordyke & Marmon Company; William Mitchell Lewis, Mitchell Motor Car Company; Roger J. Sullivan, Wayne Automobile Company, and Alfred Reeves, general manager.

PENNSYLVANIA TO GRANT RECIPROCITY.

PHILADELPHIA, April 1.—Local automobilists are delighted over the fact that after a long fight the House at Harrisburg, on Tuesday last, passed finally the measure providing for the recognition in this State of automobile licenses issued by any other State placing similar legislation on its statute books. They look forward to the time when it will be possible to pass all State boundaries without being compelled to change their tag outfits and select the proper license from the bunch in order to be ready in the event of hold-up by the "inspectors."

What with a universal license of \$1,000,000 appropriated specifically for the improvement of the Philadelphia-Pittsburg trunk-line road, Pennsylvania promises ere long to become the promised land of the automobilist.

DRIVER NOT RESPONSIBLE FOR BURSTING TIRE.

According to a decision of the Court of Appeal, of Lyons, France, an accident caused by the bursting of an automobile tire cannot be held to be imputable to the driver of the machine. Recently, on the road between Gex and Geneva, an automobile driven by a chauffeur in the employ of the Vanderbilt family, overturned, killing a man in its fall. The driver was condemned to six days imprisonment for having caused the death of the man by imprudence. In the higher court the decision was repealed on the ground that the bursting of a tire, which caused the car to overtrun, was independent of the will of the driver.

BAY STATERS FAVOR ANNUAL FEE.

BOSTON, March 30.—Rather a curious spectacle was presented this week at the State House when the automobilists appeared before the committee on taxation and were registered in favor of a bill to increase the registration fee for automobiles in Massachusetts by establishing a sliding scale based on horsepower with a minimum fee of \$5 and a maximum of \$15 for pleasure vehicles. Representatives of the Massachusetts State Automobile Association, Massachusetts Automobile Club, Bay State Automobile Association, Worcester Automobile Club, Springfield Automobile Club, and Automobile Owners' Association all told the committee that they were in favor of the bill, "with some changes." The changes which were suggested amounted practically to opposition to every phase of the bill. The speakers, nevertheless, were recorded as favoring the measure.

The Highway Commissioners say that because of the additional wear on the State roads occasioned by the increased automobile traffic they will need \$50,000 extra appropriation this year for repairs. To obtain this money it is proposed to increase the registration fee, and the bill under discussion this week was the means to that end, it having been figured out that with a graduated fee from \$5 to \$15 the income would be sufficient to pay for the extra repairs required.

In their arguments in favor of the bill the automobilists pointed out first that the measure is impossible as it comes dangerously near being in the nature of a double tax on property, automobiles being taxed primarily in the communities where their owners reside; secondly, that the measure is unworkable, because it is impossible to determine exactly the horsepower of a gasoline motor, and to determine it with any degree of exactness would require much expense and detailed study of every one of the 13,000 or 14,000 machines in the State; thirdly, that the bill is inequitable, because it singles out one class of users of the highways only and makes them pay the bills, while all other users pay nothing; fourthly, that it is discourteous, because under it machines from other States could be driven in Massachusetts only two days without being registered here; and lastly, that it is unnecessary, as the automobilists are already contributing a large sum of money each year to the State treasury.

In place of the graduated fee provision of the bill the automobilists presented to the committee a sort of compromise. They admitted that automobilists use the State highways to a considerable extent, and that undoubtedly the additional traffic shortens the life of these as well as of other macadam roads in the State. Acknowledging this, they suggested that it would be fairer to all parties concerned if the law was changed so as to make the registration fee for an automobile annual instead of perpetual. At present the purchaser of an automobile pays a registration fee of \$2 and this holds good until the machine is sold or worn out. It is estimated that with an annual fee of \$2 for registration and the fees for operators' licenses, the State would receive an additional revenue of from \$25,000 to \$30,000, which, taken together with the usual income, would provide plenty of money for highway repairs.

The Highway Commissioners are in favor of the bill because it saves them from going before the Legislature and asking for a much larger appropriation, something which State boards do not like to do if they can help it. Under the bill all the fees paid in would go to constitute a State highway maintenance fund, from which appropriations would be made for highway repairs. The question was brought up at the hearing of how the park boulevards would be taken care of and the only answer was that if the automobilists were to be made to pay for them, the fees would have to be increased still more than proposed in the bill under consideration.

The hearing this week winds up the automobile legislation for this season as far as parties outside the legislative bodies themselves are concerned. The session has been fairly prolific in proposed measures, and the State Automobile Association's committee has been quite busy.



BRIDGE OVER SUSQUEHANNA THAT WILL BE DOUBLE-DECKED.

DOUBLE-DECKING LONGEST PENN. BRIDGE.

YORK, PA., April 1.—A big improvement for the autoist will be the double-decking of the big railroad bridge which spans the Susquehanna river at Wrightsville. The bridge connects with Columbia on the Lancaster county side of the beautiful but un-navigable stream. For years the hundreds of auto tourists who use this bridge have been obliged to wait on the Columbia side for long periods while trains are passing on the low-grade freight line. The double-decking of the bridge will do away with all that delay and the autoist will be able to cross the bridge at any time and proceed on his way. The upper deck of the bridge will be used by the trolley, vehicles and autos. This leaves nothing but steam cars for the lower deck. The pedestrians will also use the upper deck. During the summer auto season it is not an uncommon sight to see scores of big touring cars cross this bridge in a day. This is the only direct route between New York and Philadelphia to the famous Gettysburg battlefield, just forty miles inland from the river.

The length of the bridge is 1.1 miles and while the majority of the tourists do not make any try at speed when crossing it, several drivers have covered the distance in less than two minutes. Nevin Hench, of this city, one of the youngest, as well as most daring autoists in the Keystone State, recently timed his run over the bridge, and made it in 1.36 minutes. The run was made in a Pope-Toledo, with three other occupants in the car.

Work is to be started on the double-decking of the big bridge at once. The woodwork arrived recently and the iron structural parts have been finished and shipped by a Connecticut firm. The recent announcement that the bridge was to be thus improved, by the Pennsylvania Railroad Company, was received with great interest by the autoists from this part of the State and others who have occasion to cross the Susquehanna at this point will also join in the general praise.

THE AUTOMOBILE IN MUNICIPAL SERVICE.

London authorities are hardly less interested in the use of the automobile for various duties previously performed entirely by horse vehicles than are private firms. The opposite illustration shows an electric police ambulance as used by the police authorities in the city of London. The transformation of vehicular conditions is proceeding at a more rapid rate in the British metropolis than probably any city in the world, owing to the advent of motor buses, motor cabs and special types of automobile vehicles. In Paris the automobile is now used by the municipality for collecting the contents of the household garbage cans, for watering the streets, for sweeping the streets, by the police and fire brigade, and as a hearse. Public transportation service in both London and Paris is now largely assured by gasoline vehicles, London being noted for 'buses and Paris for its motor cabs.

GERMANY'S VARIOUS CUP RACES.

BERLIN, March 25.—The Commission for the Imperial Cup race in June over a course in the Taunus has seen itself obliged to make decisive alterations in the route first chosen, as the long list of entries proved it too short for equal chances to be given to all starters, and as the idea of weeding out a whole row of cars did not find much favor a longer route has been settled on. This is from Kloster Thron to Homburg, Oberursel, Königstein, Glastmetten, Esch, Niederrems, Reichenbach, Riedelbach, Rod a. d. Weil, Emmershausen, Winden, Audenschmiede, Weilmenster, Luetzendorf, Ernesthausen, Essershausen, Weilburg, Eulhaus, Gravenwiesbach, Usingen, Wehrheim, Kloster Thron. Each circuit—there are four in all—is about 125 kilometers in length.

The following alterations have been made in the Herkomer propositions: The Kesselberg and Forstenried rides will be timed in minutes, seconds and fifths of seconds. The Forstenried and Kesselberg rides will be valued by means of a table to be issued later in such a manner that should the car not attain or exceed the speed fixed for it as normal, it will be debited or credited 1-100 point in the flat and 1-200 point on the hill for every commenced 1-10 per cent. By equal points on the hill the result of the flat trials will decide and vice versa, or secondarily, the ballot.

The German Emperor has presented the German Motor Volunteer Corps with a cup for a long-distance race. His Majesty is more than ever interested in military automobilism, and the question of founding a standing motor car division in the regular army is being seriously discussed and is but a matter of time and red tape now.

FORMULAE ADOPTED FOR HERKOMER TOUR.

As a means of placing all the cars to enter the Herkomer Tour during the season on an even basis, the following formulae have been adopted for the rating of the cars which take part in the deciding events of the tour, the speed trials in Forstenrieder Park and the Kesselberg hill climb:

$$X=10 \quad H+43.5 \quad \text{Km/St}$$

The foregoing is for the speed trials. For the hill climb the formula will be as follows:

$$X=6.3 \quad H+21 \quad \text{Km/St}$$

In both of which X= speed in kilometers per hour and H=the total cylinder volume in liters.

TEUTON ENTRANT FOR TOURIST TROPHY RACE.

For the first time in the history of the Tourist Trophy race a German car has been entered to compete. The seeker after honors is a German Mercedes and will have the distinction of being the first of its kind to start in the event.



ELECTRIC POLICE AMBULANCE USED IN LONDON.

WHY THE ROADS OF THE COUNTRY ARE SO POOR

WASHINGTON, D. C., April 1.—Logan W. Page, director of the Office of Public Roads, Department of Agriculture, recently submitted to a Congressional committee a very interesting summary of the work done and some reasons for the work done by that office. Among other things it is shown that the aggregate mileage of the public roads in the United States is approximately 2,300,000, not including Alaska and the island possessions. The total expenditures on these in 1904 approximated \$75,000,000, of which about \$15,000,000, or 20 per cent., was applied to permanent road work. In spite of this great outlay only 5.5 per cent. of the roads are surfaced with stone, gravel, or other hard material. It is evident, therefore, that enormous sums of money are annually wasted in the administration, construction and maintenance of roads, whereas the present outlay should, if properly applied, go far toward providing adequate transportation facilities in the form of improved roads, which are so necessary to our comfort and prosperity.

The United States is far behind Europe in this character of internal improvement, while excelling in most others. The causes may be generally stated as follows: Imperfect State laws; inefficient and improper administration and management of roads; ignorance on the part of local road builders of the principles and methods of road construction; ignorance of the qualities essential in road-building materials and lack of facilities for ascertaining such qualities; lack of sufficient research and experimental work to devise changes or improvements in road materials or existing methods of construction sufficient to meet peculiar conditions, reduce cost, or increase efficiency.

The remedies which should logically come from the National Government may be briefly stated as follows:

1. A general investigation, comparison, and explanation of existing road laws in order to provide legislators with all possible data upon which to consider improvements in existing legislation.

2. Investigation of systems of road administration and management and dissemination of the knowledge thus acquired with a view to the elimination of the worst features and the adoption of the best features in all parts of the country.

3. The introduction of proper methods of construction by familiarizing local road builders with the principles and practice essential to proper road construction and maintenance.

4. Investigation of quantity, location, accessibility, and relative value of road-making materials throughout the country and comparative tests to determine whether or not such materials possess the essential qualities.

5. Experimental and research work on a sufficiently large scale to cope with existing conditions and keep pace with the needs of the country in this direction.

All the remedies above suggested are of such character as would be capable of being realized to the fullest extent only through the National Government. For the States to carry on such work would involve a personnel, equipment, and operating expenses by each State almost as great as would be required of the National Government, with a great amount of duplication in methods and results, and much confusion owing to conflicting conclusions and recommendations. Furthermore, there is ample precedent for investigative and experimental work by the Government and much contemporary example of such governmental activity.

That the work already done by the National Government along the lines indicated in the above-suggested remedies has not produced greater results is due to the fact that the appropriations have been small and the facilities necessarily limited. For several years after the establishment of the office the appropriation remained in the neighborhood of \$10,000 annually. The results achieved by the Office of Public Roads are much more than commensurate with the facilities provided by the appropriations of Congress, and have followed in general the procedure indicated in the remedies above stated.

HOW THE AUTO HELPS SELL LAND IN TEXAS

FORT WORTH, TEXAS, April 1.—Texas lands are in great demand at this time, and it has just been lately that the automobile has entered into the process of selling the lands to such an extent that many people have been buying lands farther out than anticipated, because the automobile has covered the distance from the railroad station to the property in less time than the buyer has been accustomed to riding.

A syndicate of New England men are reported to have bought a large tract of land in the Panhandle, and are selling it off to settlers for farms. The New Englanders, so the story goes, are wealthy men and have not only come down to their lands, but have brought their families and a lot of speedy automobiles. The ground is perfectly level in that section of the State and is ideal for automobiling. When a train load of land seekers arrives, these thrifty New Englanders have their autos at the station, and, with their nicely dressed people, it gives the place a gay and attractive appearance to the tired travelers after their long and wearisome ride through Kansas and Oklahoma. One of these visitors gives the following experience:

"We arrived at the station in the morning, and a gentleman stepped up and asked me if I was looking for a farm. I told him I was. So he invited my wife and myself to get in his auto and he would show us a few of the tracts in that vicinity. We started off smoothly and rapidly, and as we rode along our host pointed out various nice farms they had sold and talked about the various soils, keeping us well interested. Finally we reached a tract of splendid farm land, which just suited us, and

we bargained for it right there. We sailed back to town, reaching there in time for an early dinner, having had a most pleasant morning ride. I bought the land and was well pleased.

"I thought my land was fifteen or sixteen miles out, as it had taken so little time to get there. The day before we had planned to leave I hired a team to ride out and see the place again, taking my wife with me. We started in the morning and never reached my farm until the third day, and it required three days more to return to the railroad station. The automobile had gone so smoothly and rapidly at a fifty-mile an hour gait that I had bought a place seventy miles from town, thinking that it was only sixteen miles out. If that is not a Yankee trick I never heard of one."

Texas is a State of magnificent distances and seventy miles in the Panhandle country is looked upon as a very immaterial proposition. The roads are so good that teams can travel long distances in a day's time, and it is not an uncommon thing for a buggy to cover 100 to 125 miles in a day and automobiles very many miles more.

These thrifty New Englanders have, however, hit upon a brand new scheme and one that is calculated to work the unwary. The automobile ride is so exhilarating in the pure ozone of that section that all sense of distance is completely lost. The victim thinks nothing of the short ride necessary to carry him to his new possessions until he changes gasoline power for horse. Probably in no direction has the automobile made its worth more manifest than in connection with the increase of real estate values.



GEARLESS 'GREAT SIX' SIX-CYLINDER, 75-HORSEPOWER.

SUBSTANTIAL GAIN IN FEBRUARY EXPORTS.

During the month of February past, the value of the automobiles and parts exported increased to the extent of \$110,000 over the same month in the year previous, the figures being \$332,713 and \$443,703. The latter sum represents 213 complete automobiles, making the average value approximately \$1,725, and \$75,394 worth of automobile parts. This substantial jump in the totals for the shortest month of the twelve in 1906 and 1907, amounting as it does to a 33 1-3 per cent. increase, is mainly to be accounted for by the showing of the United Kingdom, which increased from \$49,035 to \$100,065; France, which rose from \$9,495 to \$33,942; Mexico, from \$21,331 to \$96,262, and British North America, from \$34,507 to \$75,206. For the period of eight months ending February in the past three years, the figures are as follows: 1905, \$1,402,775; 1906, \$1,771,313, and 1907, 1,582 automobiles valued at \$2,471,859, and parts, \$401,387. The detailed report is presented herewith:

	February.		Eight Mo. Ending Feb.	
	1906	1907	1906	1907
Automobiles and				
Parts of—	Dollars.	No.	Dollars.	No.
Automobiles No..	332,713	213	368,309	1,771,313
Parts of			75,394	401,387
Exported to—				
United Kingdom..	49,035		100,065	471,017
France	9,495		33,942	123,191
Germany	4,505		4,136	35,329
Italy	69,116		30,278	131,210
Other Europe....	22,655		18,926	90,252
British N. Amer..	34,507		75,266	284,623
Mexico	21,331		96,262	166,510
West Indies				
and Bermuda ..	105,535		58,366	210,428
South America ..	7,551		6,260	48,041
Brit. E. Indies ..	4,215		183	28,364
Brit. Australasia..	1,481		15,101	118,846
Other Asia				
and Oceania.....	1,164		2,810	30,910
Africa	695		1,153	20,875
Other countries ..	1,428		955	11,717
Total automobiles,				
and parts of....	\$332,713	\$443,703	\$1,771,313	\$2,873,246

MEDAL OF HONOR FOR AMERICAN INVENTORS.

At a recent meeting of the Executive Committee of the American Institute of Social Service, it was announced that the *Scientific American* had offered a gold medal to be presented annually by the Institute to the inventor of the best device for safeguarding life and limb. An Advisory Committee of the editors of the chief technical papers was organized to co-operate with the Institute in the work of protecting life and limb. As at present constituted, the Advisory Committee consists of fourteen representatives from the *Scientific American*, *Iron Age*, *American Machinist*, *Railway and Locomotive Engineering*, *Automobile*, *Electrical World*, *Street Railway Journal*, *Dry Goods Economist*, *Electrical Age*, *Railway Gazette* and *Engineering and Mining Journal*.

NO CHANGE OF A. L. A. M. POLICY.

E. H. Cutler, who as chairman of the Executive Committee has been given the active management of the Licensed Association, recently gave out a statement relative to the policy of the association. In part he said:

"There will be no radical changes made under the new regime; the same general policy carried out so ably by Mr. Day will be followed. The purpose of the association to co-operate in every way for the mutual advantage of its members and users of automobiles will be adhered to. To promote confidence in the industry and conserve the interests of those connected with it, through the efforts of its various departments, will be an objective point. The Mechanical Branch, which has done so much for the welfare of the industry, as the cars produced under its standards and specifications attest, will be given every possible assistance by the management of the association; so with the other departments, the traffic, agency, and advertising. The Selden patent, the basic patent which, as everyone knows, covers broadly the manufacture, sale or use of the gas engine for road locomotion, must not be lost sight of in the magnitude of the work being done by the association, and the prosecution of the case which has commanded not only the attention of the entire automobile world, but that of many other industries, will be carried on as rigidly as heretofore. The conduct of a case so voluminous must necessarily be one that would seem slow to those not in close relation to it, whereas its procedure has been steady and persistent. Last summer testimony was taken right through the months of July and August, with no let-up for vacations. It was even taken up to Christmas eve and resumed the day after Christmas, something most unusual in patent litigation."

Mr. Cutler seemed enthusiastic over the early show situation, saying: "From every indication forthcoming shows will prove very interesting; the time seems opportune for the manufacturers to exhibit their products early enough to guarantee early spring deliveries. The licensed dealers have confidence in their factories output and can get their orders in early for special specifications, thus affording the manufacturers an opportunity to produce without working their factories to the limit of their capacity."

ENGINEERING BUILDING TO BE DEDICATED.

Quite an elaborate program extending over two days, Tuesday and Wednesday, April 16 and 17, has been outlined for the dedication of the Engineering Societies Building, which has been erected in New York City by Andrew Carnegie and presented as a gift to the associated engineering societies of New York. The exercises will include a number of addresses.



PEERLESS AND POLAR BEAR RUB NOSES IN DETROIT'S PARK.

GERMAN ALCOHOL EXHIBIT AT JAMESTOWN.

WASHINGTON, D. C., April 2.—Germany will send a large and comprehensive collection of apparatus employed in the production and consumption of denatured alcohol to the Jamestown Exposition, which opens April 26. This fact was conveyed to Dr. Charles E. Monroe, professor of chemistry of George Washington University in this city, who was recently appointed superintendent of the free alcohol exhibit at the coming exposition, in a cablegram from Charles Lesimple, honorary commissioner of the exposition for Germany.

The German exhibit was secured through the co-operation of a number of leading German manufacturers. As is well known, Germany adopted the policy of tax-free denatured alcohol for industrial purposes several years ago, and has led all European countries in its utilization for light, heat and power purposes.

Professor Monroe is advised that the collection of German apparatus will include the small stills, of which seven or eight thousand are now in use among the farmers of Germany; internal combustion engines, which are employed largely throughout Germany, and other classes of machinery employing denatured alcohol. Supplementing the German collection will be numerous American devices for the consumption of alcohol, including automobiles and motor boats. The alcohol exhibit at Jamestown should prove very interesting and instructive.

MORRELL ON A. C. A. ENDURANCE RUN.

Referring to the proposed endurance run to be conducted by the A. C. A. during the coming summer, Chairman Robert Lee Morrell, of the Contest Committee, comments in this vein:

"I cannot speak for the committee, but my idea would be to require the cars to make a hard day's run, perhaps from New York to Albany, half a dozen times. One day they would go to Albany and the next day return to this city and then repeat the operation. That would mean a trip of nearly 150 miles a day. Perhaps it would be advisable to have a control established at Poughkeepsie, but I would suggest that before starting the bonnets and gear boxes of the cars should be sealed, and if a car broke down between the controls it would be out of the contest. A run of this sort would show the real endurance qualities of the motors and it would be a test that would demonstrate the reliability of the car for continuous daily runs beyond question."

Recently Chairman Morrell, following the lead of W. E. D. Stokes, tendered the use of his car to Magistrate Crane for one day each week. Not long ago, when the chauffeur of Mr. Stokes was being tried before the magistrate, the owner of the car offered to supply it weekly for convalescent hospital patients, the assignment to be made by Magistrate Crane.

PITTSBURG SHOW WILL OPEN APRIL 8.

PITTSBURG, April 2.—Great hustling is being done to get the Duquesne Garden ready for the automobile show which opens next Monday night, April 8, and continues until Saturday night, April 13. Never before was the Garden so elaborately decorated for an exhibition of any sort. The setting will be green and white, and the whole hall will blaze with electric lights set in a great variety of figures. From the main entrance one will obtain first a view of long lines of cars from the stripped, polished chassis to the most elaborate limousine car, all the colors known to the coachmaker being observed. On three sides of the regular skating surface of the Garden will be ranged small stands for the display of accessories, leaving the boxes open for the public.

GLIDE MACHINE FOR VANDERBILT RACE.

Announcement has been made by the George J. Scott Motor Company, New York agents for the Glide car, that a special Vanderbilt Cup racer is being built at the factory to represent the firm in the great October race. The machine will be four-cylinder, have shaft drive, and develop about sixty horsepower.

AUTO CABS PROMISED FOR NEW YORK.

The automobile taximeter cab is coming nearer. A few months ago the New York Transportation Company purchased one of the Renault cabs fitted with distance-recording and fare-indicating device used so generally in Europe, and placed it in service at the Café Martin. According to Richard W. Meade, the president of the company, more gasoline machines will be put into commission shortly, all equipped with the taximeter. It is not stated whether the machines will be similar to the one now in service or not, but it is certain that they will have the taximeter, and this after all is the only thing the public is concerned about.

C. W. Kelsey, general manager of the American Cab and Express Company, states that he expects to have gasoline taximeter cabs in use in New York within six months. Walter Christie is also interesting himself in the cab business, and is now busy designing a 20-horsepower, four-cylinder, front-drive chassis for this class of work. All parts will be made at outside factories, only the assembling being done at the Christie works. The first batch will consist of two hundred machines. The taximeter system will, of course, be adopted.

CONDITIONS OF THE 1907 EUROPEAN RACES.

GRAND PRIX: 500 miles in one day. Fuel consumption limited to 6.6 gallons per 62.1 miles. Competitors provide their own fuel of whatever nature they desire. No weight limit or other restrictions. Teams of three from any factory. All work on racers to be done by driver and mechanic.

SPORTING COMMISSION CUP: 800 miles in one day. Fuel consumption, 3.3 gallons per 62.1 miles. All other conditions same as Grand Prix. Will be run at same time as Grand Prix.

ARDENNES CIRCUIT: 375 miles on short circuit, to be finished within eight hours. Cylinder capacity limited to 8 liters. Minimum weight, 2,555 pounds, including racing body and tires, but without tools and spare parts. Gasoline of .69 degrees will be supplied by racing board, no limit on amount.

GERMAN EMPEROR'S CUP: 800 miles. Maximum cylinder capacity, 8 liters. Minimum weight, 2,585 pounds, including racing body and tires, but without gasoline, oil, water, or spare parts. Teams of three from any factory.

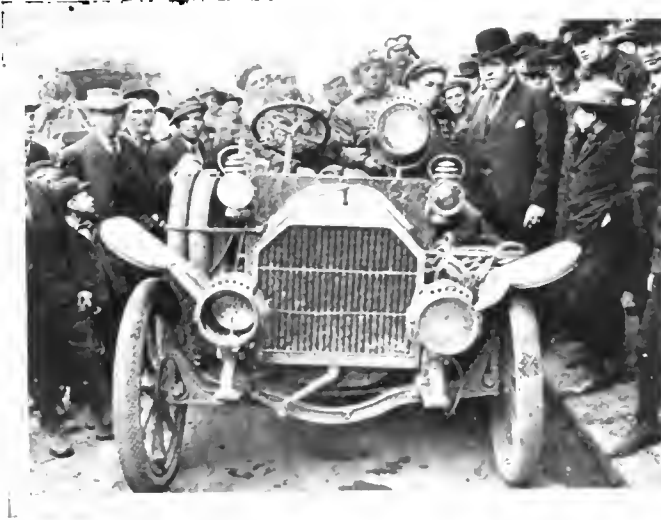
TARGA FLORIO: 282 miles over hilly, 94-mile circuit. Four-cylinder engines; bore between 120 and 130 millimeters; weight limit, 2,200 pounds for the minimum bore. Six-cylinder engines; weight allowance, 2,200 pounds for 85 mm. bore; increase of 88 pounds for every additional millimeter bore. Teams of four from any factory.

TWO DAY RUN OF HARRISBURG CLUB.

HARRISBURG, PA., April 1.—Preparations for the two days' run of the Motor Club of Harrisburg are progressing finely, the Exhibition and Runs Committee having drawn the rules for the affair and selected the route. The run will leave Harrisburg on Monday morning, May 6, between the hours of 7 and 7:30 o'clock, and will proceed to Lebanon, Lancaster, Columbia, and thence to York, where the night control will be established. The following morning the cars will leave York and proceed to Hanover, Gettysburg, Chambersburg, Shippensburg, Carlisle and back to Harrisburg. Each day's run will cover about 100 miles. R. H. Johnston, of the New York Motor Club, will bring his car to this city and act as pilot on both days of the run. E. G. Johnson, of the Quaker City Motor Club, will act as referee.

SCOPE OF SOCIETY OF AUTO ENGINEERS.

Though nominally it appears to be affiliated with but one school of engineering, due to the wording of its title, the Society of Automobile Engineers is, on the contrary, one of the broadest in scope and one of the most independent, as it has no connection with any other association. Article 1A of its constitution defines the word automobile as used in the title of the society. This is as follows: "Definition:—The term 'automobile' as used by this society is intended to cover any self-propelled vehicle operating on or under the surface of the earth or water, or in the air."



RALPH OWEN AND THE OLDSMOBILE WINNER OF SAN FRANCISCO-LOS ANGELES RACE.

OLDSMOBILE TRIUMPHS IN \$6,000 RACE.

LOS ANGELES, March 30.—Owing to the execrable state of the roads the much-talked-of contest between the Oldsmobile and Pope-Hartford cars that was to have taken place on the 14th was postponed to the 28th; and although the roads were not in much better condition than previously, the contestants decided to start. The race is the result of rivalry of long standing between E. P. Brinegar, of the Pioneer Auto Company, San Francisco, and H. D. Ryus, of the Pope-Hartford agency in Los Angeles. Mr. Ryus piloted the Pope-Hartford and Ralph Owen, of "Mudlark" fame, the Oldsmobile. The latter won the toss and chose the later start, so that the Pope-Hartford left at 5 A. M. and the Oldsmobile half an hour later.



H. D. RYUS AND POPE-HARTFORD FORDING A STREAM EN ROUTE.

Owen was heard from first at Bakersfield, announcing that he had passed Ryus about fifty miles out. The latter was not heard from again, and it turned out subsequently that the car had hurdled an embankment and broken its rear axle. For the first half of the distance of 500 miles, the roads were in an almost impassable state, and on two different occasions it was necessary to extricate the Oldsmobile from the mud with the aid of teams, the rear wheels having almost disappeared.

A MATCH RUN BETWEEN TWO FLORIDA CITIES.

By WANDERER.

JACKSONVILLE, FLA., April 1.—Ralph Owen's New York-Ormond tour has aroused in Florida drivers an ambition to make the run between Jacksonville and St. Augustine quite frequently, although the highway is of the common sandy variety and about as hard a piece of road to tackle as one can find.

Mr. Hutto, the Cadillac agent in Jacksonville, recently drove his single-cylinder the forty miles between the two cities in 2 hours and 40 minutes. The time was not generally credited, but that Mr. Hutto made it was proven beyond a doubt by his performance in a match run of the other day. While the Ford made the distance in 2 hours 17 minutes, Mr. Hutto was only 13 minutes behind him.

L. C. Oliver, the Ford agent, recently came out with an advertisement stating that he would match the six-cylinder Ford against any car in Jacksonville for any kind of test. Mr. Hutto took up the challenge. He is a native product, and the majority of the people believed that the Florida "cracker," through his knowledge of the country, would defeat the Ford. The betting, of which there was considerable, placed the little Cadillac in favor, all conditions of the match giving the Cadillac the best of it; for, if he won, it would mean a great deal to the agent, and if he lost there would be no disgrace attached to it, as it was a 6 to 1 proposition in favor of the Ford. Many believed that the Ford would get in trouble through its speed, and that the driver would either break some part of the machine through striking a tree or hitting the uneven places.

The writer, with Manager Morris of the Windsor Hotel, went out in a Maxwell runabout to South Jacksonville and was stationed at the end of the hard road which terminates about two miles south of where the sand road begins. The rivals started at 9 o'clock sharp and we soon heard the roar of the Ford, which was coming along at about fifty miles an hour. The machine had been stripped of its big tonneau, and an extra tank of water had been placed in the rear, feeding to the water cooler. This was a wise precaution, as it is doubtful if any water could have been found on the road in case the original supply should boil out. The Ford driver slowed down to about forty miles when he struck the deep sand, but that was too fast, as the machine bounded from side to side, and barely escaped hitting a two-foot water oak. The "Commodore" and driver were ready to jump, and the spectators ran back into the woods, expecting a disaster. On regaining his steering control, by which time he had slowed his engine down, the driver straightened out the machine, struck the center of the road, and the last seen of him he was making good progress, with the sand falling from the chain wheels.

About two minutes later Hutto, with his steady-going Cadillac, hove in sight. He did not follow the Ford, but took a road to the left, which he had tried the day before.

At half distance the Ford passed 1½ minutes ahead of the Cadillac. The spectators there stated that the Cadillac was cutting off the corners and not keeping to the road where it was bad. Later on the Ford broke a spring, and Hutto passed his rival, who, however, soon made his repair, caught, and passed the little machine, reaching St. Augustine 13 minutes ahead.

The race aroused considerable enthusiasm, and now the cry is for hard surface roads, which I believe will come in the very near future. The Cadillac agent desires another trial, but wants the Ford to be equipped just as it is sold from the shop, without extra water tank, and with the tonneau on.

HENRY FORD ON VANADIUM'S WORTH.

"Vibration—fatigue—crystallization; how many persons glibly use these terms and how few really appreciate their tragic import," said Henry Ford, in discussing the reasons for the application of the rare element, Vanadium, in the making of special steels for motor car construction. "Yes, tragic is the word. Few people realize how many accidents, otherwise unaccountable for, are due to the ravages of vibration and the consequent fatigue of the metal—a popular term for which is crystallization. An axle, a spring, crankshaft, frame, or any other part that has gone through months, possibly years, of rigorous work and withstood many a shock without showing any weakness, snaps like glass some fine day when there is no apparent cause for it. To the average engineer versed in the problems of other branches of mechanics this is a mystery, but the automobile engineer has long since learned the reason, and his chief concern has been to find a metal that would resist the ravages of this insidious enemy of the motor car. The quality of resisting repeated shocks, alternating stresses and vibratory action is termed 'dynamic.' And a steel which possessed the necessary dynamic properties to withstand fatigue to almost its ultimate breaking point and yet finally yield under the severest shock or stress without fracturing was the goal of our metallurgists. To obtain this result we must increase the dynamic properties without sacrificing the static qualities—must double the elastic limit and yet maintain, or increase also, the tensile strength of the metal.

"There was but one element known to metallurgy that would accomplish this end. That was Vanadium, a mineral so rare, its interest to steel specialists up to this time has been academic only. Happy circumstance has now placed it within our reach. A large deposit of the hitherto commercially unobtainable mineral has been opened up in South America, and Vanadium steel can now be made—in fact, we are making it—at about the same cost as the best grades of nickel-steel, to which latter it is incomparably superior in the properties above indicated."

AUTO TRADE AT THE HUB.

BOSTON, April 1.—Since the close of the automobile show there has been much activity among local dealers, taking care of the business that was worked up during show week. The Dodge Motor Vehicle Company, representatives of the Pope cars, the exhibit of which was the largest made by a single firm at the show, has this week delivered all the nineteen cars that were shown to their owners.

Since the show a number of local firms have moved into new quarters. Among these is the A. E. Morrison Company, agents for the Stearns and Oldsmobile, which has taken possession of its new show and sales rooms on Massachusetts avenue, near Commonwealth avenue, and now has one of the finest show rooms in New England. The quarters which the A. E. Morrison Company left on Massachusetts avenue have been occupied by the Matheson Company of Boston, of which Roy A. Faye is manager. The show rooms of the Henshaw Motor Car Company, agents for the Haynes and Columbus electrics, which are in the same building as those of the A. E. Morrison Company, are not quite completed, but will be ready for occupancy in a few days.

In the past few days, also, a new automobile district has been opened up on Huntington avenue. In the garage of the Back Bay Automobile Company, just above Mechanics' Building, the Buck & Price Company, agents for the Rainier, and the H. C. Stratton Company, agents for the American Mercedes, Car De Luxe and Kissel Car, are now located. The new agency of the Darracq is also on Huntington avenue, and with the opening of the Copley Square garage on Irvington street, near Huntington avenue, it is expected that several other firms will move into this section. There is a marked tendency to get away from the older automobile section on Columbus avenue, and as fast as buildings can be erected in the Boylston street and Massachusetts avenue section they are being snapped up for automobile stores.

THE GLOBE-GIRDLER PUNCTURED A BOOST.

This story is by Robert W. Spangler, a Chicago auto scribe: Charles J. Glidden, the globe-girdling autoist, was last week in Chicago, and one day was a guest of C. A. Coey at the Auditorium Annex for luncheon. Mr. Coey resides at the Annex, and consequently is well known to the employees. One of these is Prince Smile Arajh, of India, whose white suit and dark complexion distinguish him from the other head waiters. Seeing Mr. Coey dining with a stranger, and thinking he was perhaps a prospective customer for a Thomas Flyer, the Prince approached the table, apologized for intruding, but said he wanted to tell Mr. Coey that the half-dozen Thomas cars which he had shipped to India were giving perfect satisfaction in the royal household. To strengthen his statement he produced a post-card photograph showing, so he said, a number of the royal family in one of the Thomas cars. This card he exhibited very impressively to Mr. Glidden, who smiled faintly as he looked at it, but said nothing. The Prince then made a few more remarks in praise of the Thomas cars, and left the vicinity of the table. Turning to Mr. Coey, Mr. Glidden said:

"Your Indian friend is certainly a good advertising medium for you, but he overreached himself that time. The picture he showed us was one I took of my car in India last year."

TRADE IS LIVELY IN PHILADELPHIA.

PHILADELPHIA, April 1.—At an informal dinner at the Hotel Majestic last week, at which President Thomas, of the E. R. Thomas Motor Car Company, of Buffalo, was the host, the announcement was made that the Thomas Flyer and the Thomas Forty would be handled in Philadelphia hereafter by the United Motor Car Company, of which H. A. Dawson is president and A. H. Dorsey vice-president and general manager. The Thomas cars were formerly represented here by Martin & Hart at 215-217 North Broad street, where the new concern will continue the Thomas headquarters.

The largest automobile accessories establishment in this city—the Auto Equipment Company—opened up at 144-146 North Broad street last week. Morris Penrose, former manager of the local branch of the Fisk Rubber Company, is at the head of the new concern.

The new garage of the Foss-Hughes Company, now rapidly approaching completion at 221-223 North Watts street, will be run on the club plan, all its facilities being placed at the disposal of Pierce-Arrow, Cadillac, and Baker electric owners for limited periods free of charge.

To-day marked the opening of the first public auto express company in this city. Its official title is "The Auto Express and Trucking Company," and two vehicles were started this morning. The two vehicles put to work to-day were three-ton and two-ton trucks, built by the Reliance Motor Car Company. It is announced that the service charges will be from 25 to 50 per cent. lower than those at present in force, and that the business is bound to increase.

IMPORTERS NAME COMMITTEE TO CONFER.

At the meeting of the Importers' Automobile Salon, which was held during the latter part of last week, the consensus of opinion was general that with the Licensed Show occurring in the early part of November a showing of imported cars at a later date would be imperative. A committee consisting of E. R. Hollander and C. R. Mabley was appointed to take up the matter with the Association of Licensed Automobile Manufacturers, whose contract with the Garden precludes the holding of automobile shows in the latter not sanctioned by that body. Officers for the ensuing year were elected as follows: President, J. S. Josephs (Rochet-Schneider); vice-president, E. R. Hollander (Fiat); treasurer, C. F. Wyckoff (C. G. V.); secretary, S. B. Bowman (Clement-Bayard); directors, the officers named and C. R. Mabley (Isotta-Fraschini). An aggressive policy for the year was decided upon.

ACTIVITIES AMONG THE GARAGES.

Large Garage Under Construction at Auburn, N. Y.

Work of construction has been begun on the new garage at Auburn, N. Y., which will be occupied and operated by the Auburn Automobile Company, and which, when completed, it is said, will be the largest garage between Albany and Rochester, and one of the largest in the State outside of New York City. The building, which is to be of brick and concrete, will be entirely fireproof. It will have a frontage of 180 feet and a depth of 60 feet. It will be one story in height, and will occupy the plot of ground extending from the corner of Green and Water streets west, nearly to Hulbert street. The machine shop will be at the west end of the building, 30 x 60 feet. At the east end will be the offices, and a waiting room for ladies, also a reading room for chauffeurs off duty. The store room, or garage proper, will occupy the remaining space, and will be 130 x 60 feet. Here fifty cars can be accommodated at once, and there will be a row of stalls wherein cars may be locked by their owners to insure privacy. An important feature of the proposed building is that the roof will be supported by arched girders, so that there will be no posts in the building to interfere with the movements of the cars. The building will be ready for occupancy about the middle of May.

Centrally Located Garage for Minneapolis.

An edition de luxe of the modern automobile garage is to be built one block from the Plaza Hotel, Minneapolis, Minn., which is headquarters of the Minneapolis Automobile Club, by Joseph J. Barclay, of the Barclay Auto Company. It will stand at the junction of Huron street and Hennepin avenue, on land belonging to L. S. Gillette. The garage will be built at once, and will be of fireproof construction, with an exterior of white sand lime brick. Steel will be used to support the roof and leave the interior clear. The basement will be full size, with two stories above. The building will cost \$30,000. The ground dimensions are 90 feet on Hennepin avenue and 115 on Huron street. The first floor of the new Barclay garage will be divided into two sections. The upper 35 feet will be used for cars and the 51 feet lying on Huron street for the main garage. The entrance will be from Hennepin avenue.

Modern Garage Under Construction at Geneva, N. Y.

The work of demolition of the old Maynard house at 143 and 145 Castle street, Geneva, N. Y., has been commenced to make room for the Geneva Automobile Company's garage. The building will be two story brick, connected with the present building in the rear, making the new home of the company 132 feet long and 40 feet wide. The estimated cost of the improvements will be about \$7,000. A double track will make it possible for a car to enter the building from either Castle or Main streets and pass out again without turning round. Near the main entrance will be a fifteen-foot turntable. The second floor of the building will be fitted as a clubroom with toilet and wash room adjoining.

A \$200,000 Garage for the City of Pittsburg.

The Standard Automobile Company, of Pittsburg, Pa., will soon break ground in Aiken avenue for a six-story fireproof garage, 100 x 150 feet. The structure will probably be of the new reinforced concrete type, and will cost with the fixtures and machinery \$200,000. President W. N. Murray expects that the big garage will be ready for use in the fall. Mr. Murray was one of the pioneer automobile dealers in Pittsburg, having entered the field in 1900 as a partner in the firm of Seeley & Murray. The Standard now occupies a series of buildings at Baum and Beatty streets, and for two years its business has been far in excess of its convenient capacity for handling it.

Washington's New Garage Will Accommodate 40 Cars.

The new automobile garage of the Capitol Hill Garage Company, at 615 B street, southeast, Washington, D. C., is now near-

ing completion. The new building, which will accommodate forty vehicles and be modern in every respect, is the only one within a mile of the Capitol. J. J. Flynn has purchased the interest of H. T. Acre and is now sole proprietor of the company.

GARAGE DOES THE COUNTRY OVER.

Philadelphia.—Charles G. Henderson is building a one-story garage, 474 by 130 feet, at Philadelphia, on Fifty-first street, north of Westmoreland street. The cost will be \$8,000.

Zanesville, O.—F. A. Clark, proprietor of the Buckeye garage, has arranged for the erection of a handsome one-story brick and concrete garage on Eighth street, Zanesville, O.

San Diego, Cal.—Work has been begun on a new automobile garage for Horace B. Day at 1144 First street, San Diego, Cal. The total cost of the new structure will be about \$6,000.

Buffalo, N. Y. Volney P. Kinne has filed plans in the Bureau of Building which provide for the construction of a two-story brick garage at Nos. 1114 to 1118 Main street. The garage will cost \$14,000.

Thomasville, Ga.—A good-sized garage is to be established in this place by William Miller, which will be in readiness within a month. Thomasville is getting the auto fever in a pronounced manner, and a modern garage will be welcomed.

Detroit, Mich.—Robert L. Fee will build a garage to be devoted exclusively to the use of electric automobiles on the south side of Jefferson avenue, just east of St. Antoine street. The garage will be operated under the name of the Fee-Vincent Company.

Evansville, Ind.—After remodeling, the Dyer block at 320-322 Upper Fourth street, Evansville, Ind., has been occupied by the three Fellwock Brothers as an automobile salesroom and garage. The title of the new business will be the Fellwock Automobile and Manufacturing Company.

Columbus, O.—A new garage will shortly be opened in this city by John Field, manager of the Columbus clearing house, and A. C. Kyle, of the Broad-Oak Company. The garage, which will have all modern appliances, including an electric charging plant, will be on the ground floor of the Broad-Oak skating rink.

Waterloo, Ia.—The Summit Carriage Mobile Company has just opened a garage and factory at 512 Lafayette street, Waterloo, Ia. E. D. Cadwell is in charge of the plant. W. W. Eggers has also opened an up-to-date garage in this city, and contracted with the Bartholomew Company, of Peoria, Ill., for twenty of its large Glide touring cars.

Minneapolis, Minn.—Evans Motor Car Company, now located at 719 First avenue, South Minneapolis, Minn., is building a new garage, 50 by 125 feet, on Hennepin avenue, between Fifteenth and Sixteenth streets, which they will occupy when completed. Agencies for Mitchell, Wayne and Jewell cars have been secured for 1907.

Avon, N. J.—Located about midway between the two popular summer resorts, Belmar and Asbury Park, N. J., the garage just completed and to be managed by John Thompson, at Avon-by-the-Sea, should be a convenience to summer tourists. The new building is located at the corner of Main street and Sylvania avenue, is 50 by 100 feet, and will be fitted with a charging plant for electrics.

Pittsburg, Pa.—H. H. Marks, of New York, has purchased from H. M. Aronson the five-story brick building in Henry street, Oakland, formerly occupied by the Oakland Livery Company, for \$90,000. The building has over 40,000 square feet of floor space. The purchase was made with a view to fitting up the big structure for the largest automobile garage in this State. It is reported that it will be the headquarters for the Rainier car, and that a big storage plant will be arranged also. A. L. Richmond, Jr., owner of the Hotel Lincoln, is said to be interested in the venture.

I, BUILDER OF MANY RACING CARS.

ostentatiously away at the plant of the E. R. Company, at Buffalo, is a man who has superintended the construction of more prize and cup winning motor cars in the world to-day. The man is Michael Amide, although the greater part of his work lies with the regular production of stock cars for the Thomas company, he is at present engaged in superintending the work of remodeling and tuning up the three 115-horsepower racing cars that will be entered in the Vanderbilt Cup race this fall.



DE LONGERON.

His racing car experience commenced in 1895, when he constructed the cars that won the great Paris-Berlin, Paris-Bordeaux, and Paris-Toulouse races, and the Tour de France. In addition to these he has since constructed the cars which in 1904 and 1905 won the French elimination trial for the Ardennes cup, the French elimination trial for the Auvergne cup, the French cup itself, and in both those years the French trials for the Gordon-Bennett cup race and the Gordon-Bennett proper. That list is in addition to a number held in Europe.

Last year he constructed the three Thomas cars, one of which led the American team in the Vanderbilt Cup race and now has the work of fitting those machines, "green" at that time, for the two events in which they will participate on Long Island, the American elimination trial and the cup race proper.

NEWS FROM THE CITY OF THE MAUMEE.

TOLEDO, O., April 1.—Toledo automobile dealers consider their first attempt at holding an automobile show to have been so much of a success that they have already announced that another show will be held next year on greatly enlarged and much more elaborate plans. In addition to the display of cars, marine engines, oils and accessories, airship *Toledo No. 1*, was on exhibition, while Roy Knabenshue, Toledo's noted aeronaut, made explanations. A band of thirty pieces was present throughout the show and an opening address was made by Mayor Brand Whitlock. Noteworthy was the interest taken in the show by country people, who in many instances traveled miles to see the show, and whose interest marks an advance for the industry.

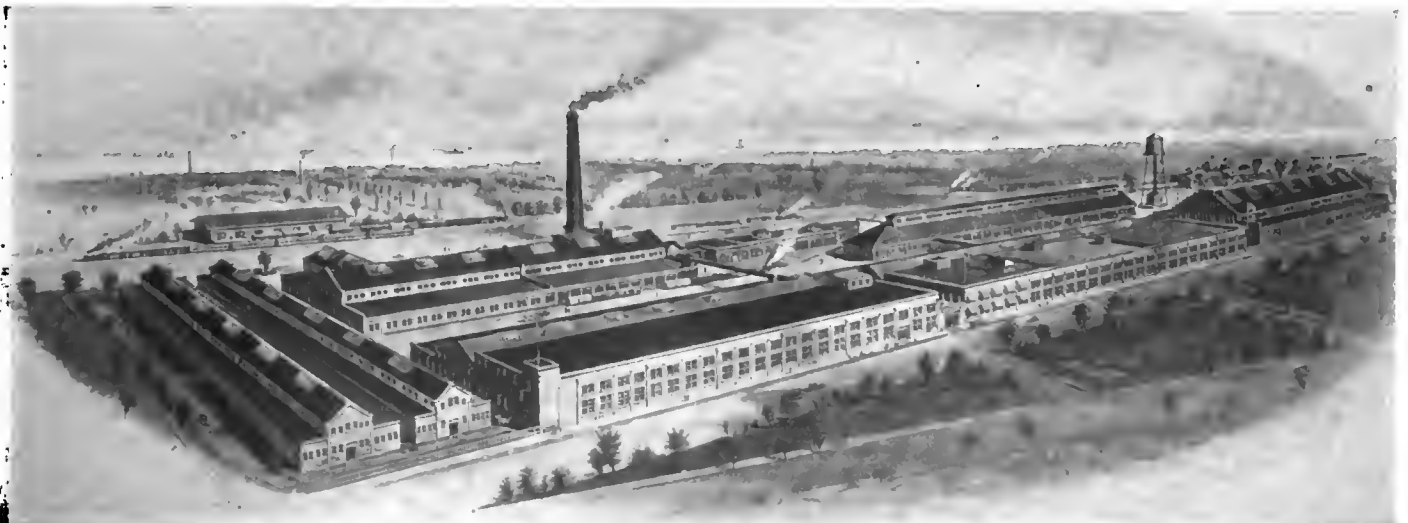
Monroe, Mich., a small town some twenty miles north of Toledo, is agog over the visit of a number of strangers, who spent some time there during the past week looking for available sites for the announced purpose of erecting an automobile factory. While mention was not made as to what concern was represented, enough was stated to lead to the belief that they represented some operating plant which is looking for a site away from the larger cities, where labor unions are likely to cause trouble.

The Toledo Storage Battery Company is placing a new battery for automobile owners on the market. Its first public appearance was at the Toledo automobile show last week.

The new city ordinance requiring automobile owners to display numbers in a conspicuous place on their machines goes into effect April 1, and there is now a grand rush on the part of owners to comply with the new law, which is the final outgrowth of a fight covering several years.

GROWTH OF A MODERN AUTOMOBILE PLANT.

Starting originally with an ordinary factory building of small dimensions in the east end of Cleveland, the Winton Motor Carriage Company has, in the course of a comparatively small number of years, even as such things go in the automobile industry, developed one of the largest and most complete plants for the manufacture of automobiles to be found in this country, or even in the world. It was not long before the original facilities mentioned, consisting of the former plant occupied by the Brush Electric Company, were outgrown, so that as far back as 1902 the beginnings of the present plant on the Berea Road in the outskirts of the Forest City were undertaken. With an eye to the future development that followed so quickly, a large tract of land was purchased on the line of the Lake Shore and Michigan Southern Railway. The first buildings erected were the powerhouse, foundry, machine and paint departments and the shipping room. Though the latter were occupied for the first time in the fall of 1902, the following year saw the erection of new buildings to house the assembling and repair departments and the woodworking shop. At that time the buildings did not occupy the land to the exclusion of everything else, and a half or three-quarter mile board track was made around them for the testing of cars. The Winton restaurant constitutes a department that was added and housed in 1905. Last year the machine and paint shops were enlarged by a 25-foot addition on the side fronting the Berea road, as well as by a second story on both and a third story over the east end of the machine shop to accommodate the draughting department. Some idea of the extent of the plant as it stands to-day may be had from the illustration of the factory and its surroundings printed below.



BIRD'S EYE VIEW OF THE PRESENT EXTENSIVE PLANT OF THE WINTON MOTOR CARRIAGE COMPANY, CLEVELAND, O.

BRIEF ITEMS OF NEWS AND TRADE MISCELLANY

Plans are under way for a new building on Michigan avenue for the Chicago store of the Pierce Engine Company, of Racine, Wis. It will be located south of Fourteenth street.

Announcement is made by the Larchmont Automobile Company, of Larchmont, N. Y., of the opening of a first-class garage on the Post road between Larchmont and Beach avenues.

The York Motor Car Company, of York, Pa., is experiencing a very busy season. The company is now turning out Pullman cars at the rate of eight per week, and one-half of the season's output will be delivered by April 1.

The Maxwell alcohol economy run to be held from Trenton to Atlantic City has been postponed until April 5, as it was found impossible to put the car selected for the test in the best condition for the run before that time.

The Carter Motor Car Corporation announces that a selection is about to be made of a tract of land near Washington, D. C., as a site for their new factory. The location is an ideal one, having excellent shipping facilities and being easily accessible by electric cars.

Arrangements have been perfected between the directors of the Geneva, N. Y., Chamber of Commerce and David Reid, president of the Motor and Manufacturing Works Company, of Ithaca, to remove the industry to Geneva. The new company will have a capital of \$40,000.

"The automobile buying public will soon learn," says Charles B. Shanks of the Winton company, "that no quantity of special steels in an automobile can offset ignorance of the 'know how.' It is always safest to buy cars made by men of the broadest experience, for they are the only ones who know how, when, why and where to use and not to use special steel mixtures."

In New York State the registration of automobiles has reached the great figure of 37,850. Allowing for registered cars not in use and the sales of cars a second time, it is estimated that more than 30,000 automobiles are employed in this State. Of this number it is figured that 15,000 are owned in New York City. In registrations New Jersey stands second to New York, with a total of 26,650 to the end of March. Massachusetts has a total of 18,170 and Pennsylvania 3,775.

"Procrastination," says a well-known Columbia dealer, "is one of the worst features of the average autoist. He thinks that a car should perform consistently day after day without so much as a casual looking over. A little oil here and there, taking up the chain slack, maintaining a constant oil level, care in engaging the clutch and shifting gears, keeping contacts bright and clean—in fact, any of these numerous little operations which could be performed in periodical inspections would easily keep the car up to the highest standard of efficiency."

Asked in relation to the annual Orphans' Day outing, inaugurated by the New York Motor Club, R. M. Owen of the Owen company, distributors for the Reo and Premier, says that he is in

hearty accord with the plan of taking a great number of parentless children to Coney Island for a day's pleasure trip. Mr. Owen further says: "We will be pleased to furnish Reo and Premier touring cars. Movements of this nature should receive the hearty support of dealers, for they tend to cultivate a friendly public attitude towards motorists as a whole, the benefits of which to the trade cannot be overestimated."

One of the most popular shock absorbers and jolt eliminators now in use is that made by the Hotchkiss Manufacturing Company of Chicago. The Hotchkiss device sets on the springs and the principle of operation is a piston working in a circular cylinder, alternately forcing glycerine through a large check valve and a small needle valve. On the downward compression motion the glycerine passes through the check valve without resistance, and returns to the cylinder, allowing free play to the springs. The slightest pressure on the recoil closes the check valve, the piston reverses, and forces the glycerine through the needle valve, which is regulated from the outside to the exact pressure required to check the recoil and bring the car back to its normal position, slowly, without jar or jolt, a feature upon which the manufacturer of the Hotchkiss lays much stress.

NEW AGENCIES ESTABLISHED.

George L. Lyon, State agent for the Reo automobile, has made a contract with Messrs. Ham & Ross to handle the Reo in Charlotte, N. C.

The Orlando-Kessler Auto Company is a new concern located at 36 West Capital street, Columbus, O. Lozier and Autocar are represented.

A recent addition to the Boston auto trade is the Atlas runabout, made in Springfield and sold in Boston by J. W. Crowell at 92 Massachusetts avenue.

The Franco-American Auto and Supply Co., of Chicago, announces the appointment of the following agents as distributors of Michelin tires and the territory covered by each: Curtin & Williams Co., Columbus, O.; Coughlin & Davis, Cincinnati, O.; H. B. Groves Company, Sioux City, Ia.; Norris Automobile Company, Saginaw, Mich.; Kirk Bros.' Motor Car Company, Toledo, O.; Fawkes Automobile Company, St. Paul and Minneapolis, Minn.; W. C. Anderson, Cleveland, O., and radius of fifty miles; Western Auto Supply Company, Cedar Rapids, and Eastern Iowa.

PERSONAL TRADE MENTION.

W. R. Walton has been appointed Northwestern representative of the Firestone Tire and Rubber Company, traveling out of Chicago. Mr. Walton was formerly Wisconsin representative of the Fisk Rubber Company.

A. W. Church, secretary of Wyckoff, Church & Partridge, is expected to arrive in New York shortly, having recovered from the accident that he met with some time ago while returning in his carriage from the theater.

RECENT TRADE PUBLICATIONS.

The Victor hand-forged automobile is a simple, low priced machine for which many claims are made in the booklet just published by its manufacturers, the Victor Automobile Manufacturing Company, 171 Carroll street, St. Louis, Mo.

The feature of the smart little catalogue on Albany grease, made by Adam Cook's Sons, 313 West street, New York, is that it gives general directions on how and how often to lubricate such important parts as axle bearings, gear case, steering gear, chains, etc.

Catalogue twenty-two, from the Manhattan Electrical Supply Company, Park place and Murray street, New York, contains something electrical for everybody. The entire field of electrical appliances is covered and of course the automobilist's requirements are not overlooked. Each article is described, illustrated and priced.

A special circular has been issued by the Motor and Manufacturing Works Company, Ithaca, N. Y., on their well-known types of ejector mufflers. The booklet contains a complete price list, a description of the features of this type of muffler, and full particulars of the various types manufactured for automobiles, marine and stationary engines.

Cold drawn seamless steel work as produced by the Nortmann-Duffke Foundry Company, Twenty-sixth and Layton avenues, Milwaukee, Wis., is described in the company's new catalogue. The work includes seamless steel reservoirs, carbonate shells, cylinder tanks, crucible steel castings, gray iron castings, etc. They are all fully dealt with in the booklet.

The Great Smith catalogue is an elegant production, dealing worthily with the Great Smith, built by the Smith Auto Company, of Topeka, Kan. The description is complete, the illustrations are excellent, and altogether the catalogue is one which presents the Smith in a very interesting manner. The catalogue can be obtained from headquarters or from the New York agency, 1855 Broadway.

"Betty" has come to town. Her arrival is not likely to pass unnoticed, for "Betty" is the Goodrich girl—the Goodrich girl divine. She is a handsome girl, too. She has no designs, but simply asks a place. If she has not called upon you, a word to the B. F. Goodrich Company at Akron, O., will bring her. To the small number out of the pale of Goodrich acquaintanceship she will cost 75 cents, postpaid, to applicants by mail.

AN EFFECTIVE SIGNAL GONG.

A signal which sends an alarm far ahead of the automobile is always a necessary fitting. The Watres auto gong, which has been marketed by the Watres Manufacturing Company of 1139 Broadway, is a powerful three-tone chime gong operated by the exhaust stored in a separate tank. By this system the signal can be sounded at all times, when the car is running down hill with the engine dead, or when the auto is at a standstill. The device is simple to attach, requires no special machine work and sells at a moderate price.

INFORMATION FOR AUTO USERS.

A Novelty in Tool Boxes.—Some time since, a Rambler dealer, on a visit to the factory at Kenosha, was shown the drafting room. He was interested in the cases of drawing instruments, with each article in a compartment adapted thereto, and finally expressed himself thus: "Say, why can't we have cases like



RAMBLER TOOL BOX.

that so that our tool boxes won't sound like a junk shop in a cyclone and a man may be able to get what he wants when he wants it without digging for it." The outgrowth of the suggestion is a double-top tool box as shown in the accompanying illustration. The entire cover is aluminum with the lower section designed to hold four wrenches, two spark plugs and a socket wrench. A rubber lining in the cover prevents rattling and displacement of the tools. The latch is so constructed that the entire cover may be raised, giving access to the body of the box without releasing the latch holding the two portions of the cover together. It is now a part of the regular equipment of all Rambler cars.

The "Pater-Noster" Shock Absorber.—Experience and patient investigation extending over a number of years has demonstrated that the solution of the suspension problem appears to point in the di-



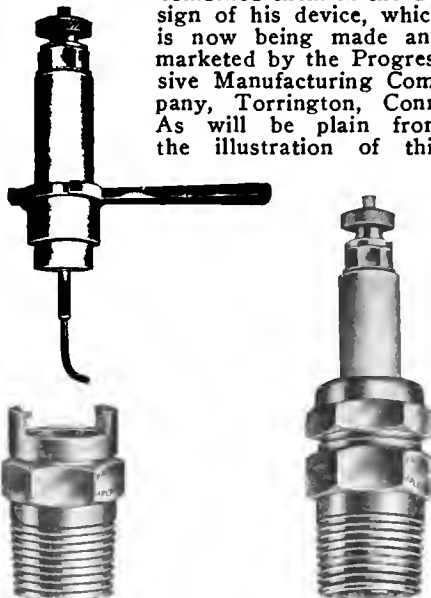
PATER-NOSTER SHOCK ABSORBER.

rection of auxiliary shock dampening devices rather than more or different kinds or sizes of springs, as despite the great improvements in the latter during the period in question, there is no doubt in the mind of any designer at the present day of the necessity of a shock absorber

on the car. In view of this, a description of the Pater-Noster, which is the result of three years' study on the part of the European house of Herz & Company, and is manufactured by the same concern at their works at 203-205 Lafayette street, New York City, will be found of interest. Patents have been taken out in a number of different countries, and the Pater-Noster has been widely adopted on the Continent before its advent on this side of the Atlantic. In its design, both the upward and the downward movement of the car are taken into consideration, so that each movement may be checked separately.

It consists of two brake bands side by side, working on two separate drums. One of these drums is cast integral with a sleeve sliding over a central bronze arbor extending out of the bronze casing which encloses the whole mechanism. The other brake drum is connected with the central arbor only through the medium of a roller clutch. The entire mechanism is encased in a bronze housing which is filled with glycerine. The roller clutch allows the free downward movement of the spring and holds in but one direction, that of the recoil. The downward jar is taken care of by the second brake band, this being a particular feature of the Pater-Noster already made mention of. In the lever connecting the device with axle is inserted a device termed the "auxiliator," permitting short movements of the spring.

Brown Separable Lock Spark Plug.—Simplicity and ease of cleaning are two prime requisites of a good spark plug, and the inventor of the Brown separable lock plug has combined them in the design of his device, which is now being made and marketed by the Progressive Manufacturing Company, Torrington, Conn. As will be plain from the illustration of this

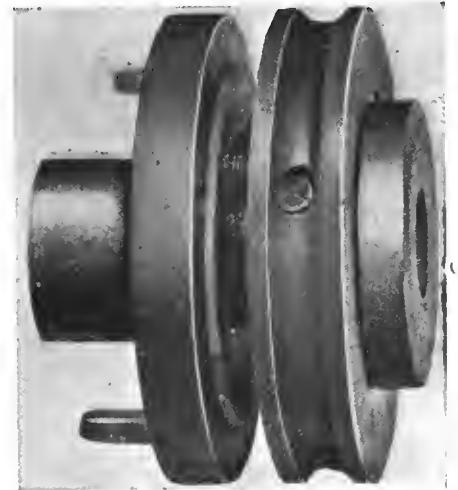


BROWN SEPARABLE LOCK PLUG.

plug showing it apart, the porcelain can be removed with half a turn without disturbing any other part of the plug, and without the aid of a wrench. Nor need the terminals be disconnected, as the porcelain does not turn in releasing. In addition to these advantages, the construction of the plug is designed to prevent carbon reaching the insulation. These plugs have been given a thorough

trial in actual use extending over a lengthy period and have been found to give excellent service. Beside this plug on which patents have been applied for, the same concern also manufactures the Brown regular or standard spark plug, shown in the second illustration.

Kane Self Starting Device.—The fact that the gasoline motor has to be cranked to get it under way has always been considered one of the greatest drawbacks of the automobile. Devices innumerable have been invented to overcome this fault, and more and more attention is being paid to the question of evolving a device that will be at once simple, practical and inexpensive, not to mention that chief requirement of all, re-



KANE SELF-STARTER FOR MOTORS.

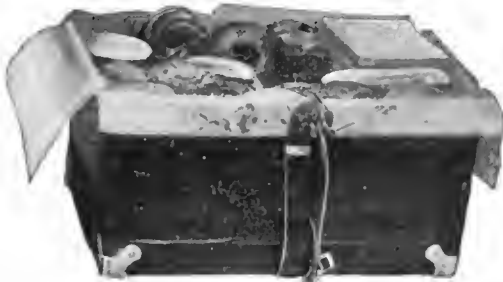
liable. The Kane Starting Device Company, 762 Junction avenue, Detroit, Mich., have just brought out the mechanism shown in the accompanying illustration, which is small and is attached where the starting crank connects with the motor shaft. It is placed under cover and is operated from the driver's seat. It consists of two roller ratchets and a wedge chair so arranged that the slightest backward movement of the motor releases the grip on the shaft entirely. The main or working ratchet is released by wedges which act only on the reverse action of the motor. On the secondary ratchet there are 45-degree grooves, engaging with internally cut grooves of the same pitch in the outer member surrounding the secondary ratchet.

The outer member cannot revolve, being held in position by pins, but reverse action of the motor and the working of the secondary ratchet makes a positive movement of the outer member toward the main ratchet thereby forcing the wedges behind the rollers and causing a positive release of the shaft. When the reverse action of the motor ceases, the wedge chair is returned to its normal position by springs operating between the main ratchet and wedge chair which also force the outer member of the secondary ratchet to its place.

Lubricating Oils for Special Purposes.—The Underhay Oil Company, Boston, Mass., are sending out an attractive folder in colors showing on the outside a Continental soldier aiming his old flint-lock intently at something in the dis-

tance. It is captioned "Our Aim," and the makers go on to state that this is to produce a line of lubricating oils of superior and uniform quality, especially adapted for the purpose to which they are to be applied, and on that account the most economical in service. Some of their brands are "Premium Valve Cylinder," "216 D. Cylinder," "Monarch Cylinder," "Electric Cutting" and a number of others.

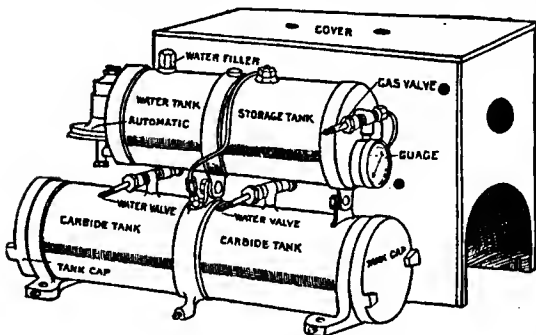
The Auto Folding Lunch Box.—Nothing is quite so conducive to good appetite as a spin over country roads in fine weather, and when it is a question of



A HANDY LUNCH BOX FOR AUTOISTS.

catering to the internal wants of the passengers of a touring car no little space is required to accommodate a sufficient quantity of edibles. To provide a handy means of carrying them, the Atlas Manufacturing Company, Hampton, N. H., has brought out a line of auto folding lunch boxes. They are made in various sizes, operating on the same general principle as is usually employed in collapsible boxes. A high grade of leather board is employed and well braced, the sections being bound together with leather hinges, making them light and strong.

Convenient Acetylene System.—Up to the present, acetylene gas has always been generated as used, or carried in special tanks under pressure on the automobile, but the Eco Manufacturing Company, 53 State street, Boston, Mass., manufactures a device that automatically makes and stores the gas in a tank ready for use—a method that possesses many advantages. The flow of water is con-



AUTOMATIC ACETYLENE GAS SYSTEM.

trolled by a diaphragm regulator operated by the pressure of the gas, but as a further precaution the generator is provided with bronze safety valve set to blow off at a low pressure. The generator proper consists of an upper and lower tube, the latter divided to form two carbide chambers; threaded caps close the ends of these chambers, making them gas tight. Each chamber accommodates

a basket for the carbide. The upper tube is also divided into two parts, consisting of a water tank and a storage tank. The former is provided with a gas-tight filling vent and an outlet level with the bottom of the tank, to which is attached the automatic water valve. From the latter, two pipes lead to the carbide chambers, with shut-off needle valves independent of the automatic valve, to stop the flow of water when the generator is not to be used for some time or when recharging.

The storage tank has a safety valve, gas outlet, pressure gauge connection and reducing valve in piping leading to the lamps. The generator is so designed that no water can possibly reach the carbide except through the automatic regulating valve, so that the vibration of a car or the rolling of a boat does not affect it. The best of Tobin and phosphor bronze is used throughout in its construction, making the generator an ideal device for touring or yachting, as several weeks' supply of gas may be carried in the form of carbide in a small space.

Compression and Valve Tester.—Under the title of the "Compressometer," Henry W. Brown, Syracuse, N. Y., is placing on the market a device that will be found very convenient when the location of a fault in the compression of a cylinder, whether through defective piston rings, or from poorly seated valves, is in ques-

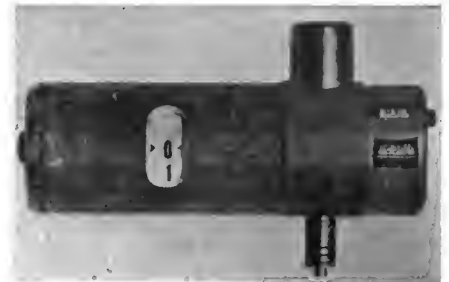


THE BROWN COMPRESSOMETER.

tion. It consists of a frictionless 100-pound gauge, the indicating point of which remains at the highest point reached until returned to zero by hand. A unique ground swivel joint connects the cylinder under test with the instrument. This joint, which permits of placing the gauge face at any angle, is independent of the instrument itself and screws into the cylinder like an ordinary spark plug.

A Radically Novel Speedometer.—The Casgrain speedometer has the decided advantage that the dial movement is practically one-half inch for each mile instead of six miles in every half inch of dial, as is sometimes the case. In other words, the progressive miles on the dial, from 0 to 65, extend over a distance of twenty-eight inches. This not only gives figures of good size and for every mile, but it means that if the figures are out of adjustment 1-4 inch the instrument would not be more than 1-2 mile away from the accurate reading, while on a 5-inch indicator reading the same 1-4 inch out of adjustment would mean nearly six times that inaccuracy, or about three miles. This ought to give thought to those looking for accuracy and a dial easily read because of its slow movement.

To give this long reading, the figures run around a barrel in a helical line of a fraction more than four turns. On the inside of this barrel are inwardly projecting vanes and the barrel itself moves back and forth on a center worm corresponding in pitch to the helix of mile figures. Outside this barrel is the enclosing case with an opening through



FRONT VIEW OF CASGRAIN SPEEDOMETER.

which the reading becomes visible. The usual flexible shaft is used to operate the instrument, but this shaft only moves a second shaft in the instrument itself, there being no mechanical connection between the indicator and this mechanism. This second shaft is at a right angle with the entrance of the flexible shaft, and carries a simple two-bladed paddle wheel. The two blades project inwardly from their driving shaft, moving around the concentric well between the vanes of the barrel and the central worm on which the barrel moves. In this well is carried a liquid which as it is revolved by the paddles, acts as a drag on the vanes of the barrel. From this the barrel moves back and forth on its central worm in proportion to the drag on its vanes, the latter proportioning itself to the speed of the paddle wheel. The instrument also carries a trip and a total reading odometer. The Casgrain Speedometer is made by W. J. Connell, 36 Columbus avenue, Boston Mass

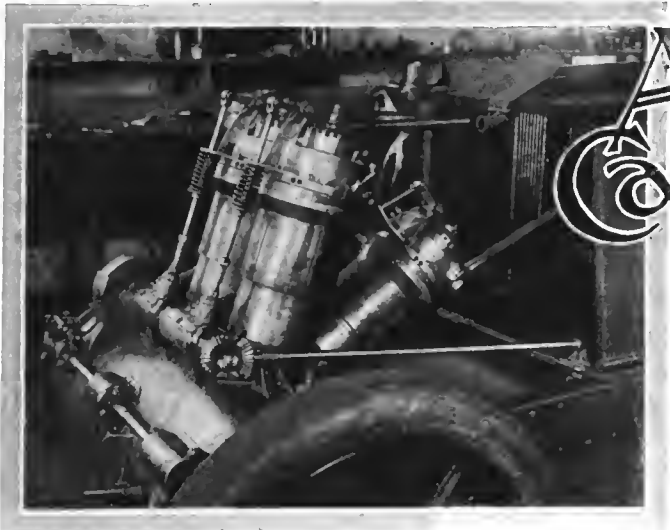
A Handy Tool.—Nothing facilitates repairs and adjustments so much as a tool that "is always on the job." Whether the work in hand be one thing or another, it is apt to consist for the most part of dismantling and reassembling and it is in these operations that a handy tool saves time and temper. One that



IRLAND PIPE WRENCH.

comes in this category is the Ireland pipe wrench, made by the Ireland Pipe Wrench Company, 15 Court Square, Boston, Mass. It has no slow screw adjustment, but is instantaneous in action and firmly grips anything that comes within its range without binding—features that are appreciated when adjustments are being made beneath the car. It is made in sizes designed to grip anything from a 1-8-inch wire up to a 1 1-2-inch pipe, with handles of lengths to correspond.

THE AUTOMOBILE



America's
Candidate
for the
Grand
Prix
By
W. F. Bradley

tubular radiator passes from one side of the frame to the other in the form of an inverted U, the two seats are to the rear of this and the gasoline tank is carried astern. By looking under the radiator the driver obtains a good view of the engine; altogether the racer is compact and accessible and has the advantage of a perfectly clean underbody, for the entire chassis from crankcase rearwards is floored in by thin sheets of aluminum.

The Power Plant.

IT is never safe to prophesy about an automobile race, even if you know. One thing, however, that may be predicted with certainty about the Grand Prix is that the American representative will be watched with more than ordinary interest by constructors and automobilists on both sides of the Atlantic. In designing his car, Walter Christie has remained true to his first love and is more convinced than ever that a front drive and front steering machine is capable of holding its own against European chain or shaft-driven flyers.

No front-drive racer has ever been built in Europe, and, indeed, only one firm in the whole of France has attempted to produce pleasure or commercial automobiles of this type. The French racers in the Grand Prix are conspicuously alike and bear a close resemblance to the machines of last year, despite the radical change in racing rules. It remains for the foreigners engaged in the French race, and for the American entrant in particular to add a little interesting variety.

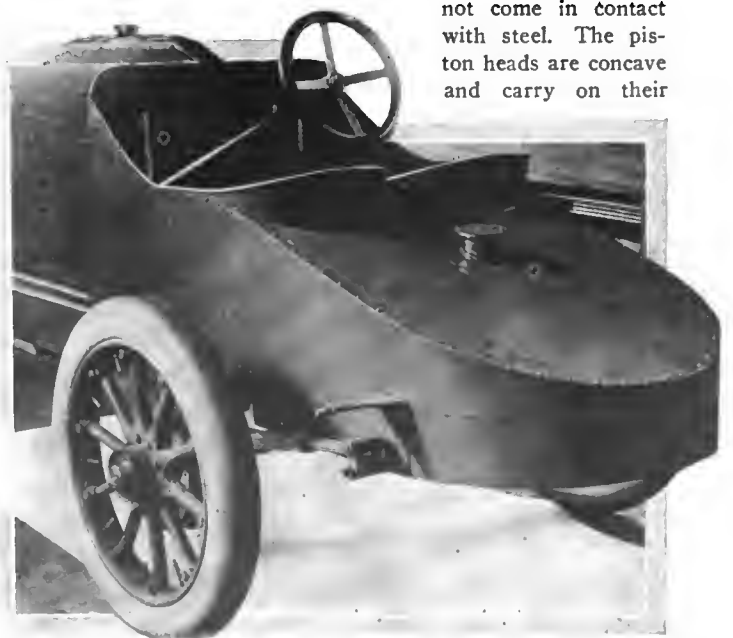
Grand Prix Racer Entirely New Production.

No part of the Christie machine which ran in the last Vanderbilt race has been used in the new automobile. Construction is on similar lines, but greater care has been taken in the selection of the material and a number of improvements suggested by past experience have been carried out. Specially imported Bischoff steel is used very largely in its construction, and many parts which last year were of bronze are now of this metal. The frame is of channel-section pressed steel, with rounded rear, wheel base being 100 inches and track 56 inches. The machine has not yet been weighed in its completed condition, but it is estimated that it will not scale more than 1,700 pounds. In proportion to its horsepower, it will be the smallest and lightest machine in the race.

Being both front-driving and front-steering, the entire motive power of the car is carried forward, the rear portion being absolutely free. The engine is mounted on a circular nickel steel crankcase, carried across the forward end of the chassis, the

circular steel crankcase across the frame fulfilling most of the functions of that organ. The four separate steel cylinders, 7 1-4 inches bore by 7 1-4 inches stroke, are bolted on the crankcase, staggered, with a distinct leaning rearwards. A copper water jacket surrounds each cylinder and a circulation of water is assured around the valves, all of which are in the cylinder head. The steel pistons carry three segments placed close to the head, and on the lower portion of the pistons are two bronze bearing-metal rings each about one and one-half inches in depth. Thus, though the piston and cylinder walls are of the

same metal, steel does not come in contact with steel. The piston heads are concave and carry on their



"CRADLED" GASOLINE TANK AND TIRE PLATFORM.

lower surface a number of radiating fins. All valves are in the head, the exhaust valves being mechanically operated by a rocker arm from a single camshaft mounted outside the crankcase and driven by an intermediate gear from the right-hand side of crankshaft. There are eight small automatic inlet valves for each cylinder arranged circularly in the cylinder head around the single exhaust valve. Over each cylinder head is bolted a manganese bronze inlet valve chamber, to which are connected the intake pipes from the carbureter.

Christie Machine Can Do Two Miles a Minute.

The engine speed is normally 1,000 revolutions per minute, accelerating up to 1,200 revolutions. As one revolution of the crankshaft corresponds to one revolution of the road wheels, the machine will, with the size of wheels now employed, be capable of doing two miles a minute. The Dieppe course being exceedingly fast, this ratio will doubtless be maintained if the practical fuel tests about to be begun accord with theory.

The engine is fitted with a Breeze carbureter modified somewhat to suit the racer. Lubrication is assured by a Pedersen pressure feed oiler. Ignition is by battery and Heinz five-unit coil. The commutator is also of Heinz manufacture. An ignition cut-out is provided on the steering wheel and spark and throttle levers are placed under the wheel.

One of the most interesting features of the car, and the one in which it differs entirely from its competitors, is the method of transmission and drive. Normally the drive is direct from the two-throw camshaft to the front wheels, one revolution of the shaft giving one revolution of the road wheels.

The machine being front steering as well as front driven, a universal joint is provided between each road wheel and the crankshaft. There are two manganese bronze flywheels, grooved and fitted with layers of woven camel's hair, which will give a perfect binding surface and which experiments have proved cannot be burned by slipping of the clutch. Chrome steel is used for the clutch, and this metal is also employed for the keyways, which on last year's machines were of bronze.

Change Speed Gear Shows Individuality.

One low speed and a reverse are provided by sliding gear mounted on the front of the crankcase parallel with the mainshaft. A gear is cut around the face of the flywheels, and for low and reverse drive the transmission is by gears from the crankshaft, through intermediate gears within the crankcase, to the sliding gear and pinion, meshing with gear on the face of the flywheel. All these gears are, of course, enclosed and are remarkably small. Front suspension is necessarily modified by the peculiar front drive, coil springs and a large rubber buffer being used.

There is no driving mechanism whatever rear of the dashboard, the rear axle, made of hollow steel, having only to support the weight of the car. Semi-elliptic springs are consequently employed, attached solid forward and shackled at the rear. Ex-

panding internal and contracting external band brakes, both woven camel's hair against steel, are mounted on drums on the rear axle. Breaking strain, however, comes on the distance rods and not on the rear axle itself. The rear brakes are operated by foot pedals, so placed that the two can be covered with one foot.

Water Cooling System is Distinctive.

The whole of the space between the engine and the dashboard is occupied by a Kell's tubular fin radiator in the shape of an inverted U passing from one side frame to the other. The rear-most radiator tube touches the dashboard, but to reduce the danger of breakage by vibration wood is interposed between the two. Between the lower tubes of the radiator and the side frame on which they rest a strip of leather is inserted with the same object, the radiator being wired to the frame by soft copper wire. A little improvement is noticeable here as the result of past experience. Instead of a single wire being wound through, which, if it should break, would leave the entire side of the radiator free, a separate wire passes between each tube to its hole pierced in the frame. The breaking of a few wires would not interfere with the stability of the radiator. Water circulation is assured by a bucket pump driven by bevel gears from the camshaft. The commutator is driven from the same shaft.

As everyone knows, the Grand Prix is run on a limited fuel allowance. No attention will be paid by the racing board to the weight of the machines or their mechanical features, but the tanks will be examined conscientiously. Walter Christie has placed the gasoline tank behind the seats within a rear cradle lined with



CHRISTIE RACER, SHOWING COMPACTNESS OF POWER PLANT.

wood to prevent friction between the two metals, and completely covered over by a metal shield screwed down for easy removal. The tank filler is the only portion which is exposed. For examination it is only necessary to take out the screws, disconnect the pipes and lift the tank out of its cradle. When all is closed up the metal box protects the tank and the fuel, the loss of even a small quantity of which in the race might decide between victory and defeat. The top of the tank cradle will also serve as a platform for spare tires. Twenty-five gallons of gasoline can be carried in the tank; as the total allowance for the race is about forty gallons, it will only be necessary to stop once to replenish the supply.

Christie Designs His Own Dismountable Rims.

Patent rims of Walter Christie's own design are employed, the feature of which is that there is no felloe, the hollow steel spokes, ten in number, bolting to lugs on the movable rim on which the tire has been previously mounted and inflated.

Engine control is obtained by spark and throttle levers under the steering wheel, the two brakes are operated by left-hand pedals and the clutch by a foot pedal to the right; this reversion of the usual method of placing pedals has been necessary to get a more convenient connection. Change-speed gear is operated by a side lever and the clutch can also be withdrawn by a side lever provided with a rack and notch for keeping the clutch out.

THE GRAND PRIX.

PARIS, March 28.—Ex- cepting the front-drive machine being built by Walter Christie, the Grand Prix racers are constructed on such uniform lines that a tabular comparison of their features is a simple matter. Of the 34 competitors, representing 15 firms and 7 nations, 17 have final drive by side chains and 16 have propeller shaft and rear live axle. The proportion remains about the same from year to year. Brasier, who last year constructed shaft and chain-driven racers, is still experimenting with the two types. Panhard, on the other hand, though building all ordinary touring machines with side chains, has decided to use propeller shaft drive again. In last year's Grand Prix 20 shaft machines started and three finished, the percentage of arrivals being 15. Fourteen chain - driven machines started and 8 of them, or 57 per cent., finished the race.

Makers seem to be equally divided on the qualities of high and low tension ignition. It will be noted that all machines, with the exception of Christie's, are equipped with magnetos.

Leather - faced cone clutches maintain their position, notwithstanding the attacks of different types of metal disc clutches. With such firms as Darracq, Brasier and Renault as its advocates, it cannot be said that the cone clutch has ceased to exist. Mercedes adheres to its particular type of spiral spring clutch.

Shock absorbers are used on nearly all the machines. Darracq and Renault, as last year, have built racers with no differential.

Carbureters are in each case the standard type used by the firms in their stock machines. Doubtless many minor improvements have been made here, for the Grand Prix is a fuel consumption race. There is nothing, however, that can be tabulated, and makers are not very communicative.

CHARACTERISTICS OF RACERS ENGAGED IN THE FRENCH GRAND PRIX.

MAKE	Driver	Type of Motor	Bore inches	Stroke inches	Horse Power	Ignition	Radiator	Cooling	Carburetor	Clutch	Change Speed	Drive	Weights Pounds	Wheelbase inches	Track inches	Rims	Particular Features
Bayard-Clement	A. Clement	4 separate steel jackets, copper cylinders, in pairs	6.2	6.2	125	Simms-Bosch h.t. Magneto	Honeycomb	Cent'f'l pump	Bayard-Clement perpendicular cur rents	Hele Shaw disc steel & bronze cone	4 speeds, sliding gear, reverse by separate lever	Chains	2244	112	53	Dismountable	D. W. F. ball b'gs, Automatic sparking ad.
Darracq	Gauderman	4 cylinders, in pairs	7.08	5.9	130	Simms-Bosch h.t. Magneto	Winged tubes	Gear pump	Darracq parallel currents	Bronze-faced cone	3 speeds, sliding gear	Shaft	2200	106	52	Wire, dismountable	D. W. F. ball b'gs, V-shaped rad'r, no differential
Motobloc	Hannot	4 cylinders, in pairs	6.6	5.9	110	Nilmelior h.t. Magneto	Winged tubes	Cent'f'l pump	Dombret	Metallic seg- ments	4 speeds, sliding gear	Chains	2332	112	55	Dismountable	Motor, clutch & g'r box 1 unit
Corre	Kistmakers	4 cylinders, in pairs	5.9	5.9	80	Simms-Bosch h.t. Magneto	Winged tubes	Thermo pump	Corre parallel currents	Leather-faced cone	3 speeds, sliding gear	Shaft	2099	110	55	Michelin dismountable	Michelin dismountable
Panhard	D'Hespel	4 cylinders, in pairs	7.2	5.6	125	Bissmann h.t. Magneto	Honeycomb	Cent'f'l pump	Lebra perpen. cur rents, Hydraulic governor	Hele Shaw disc steel & bronze cone	4 speeds, sliding gear	Shaft	2376	112	53	Michelin dismountable	Michelin dismountable
Renault	LeBlon	4 cylinders, in pairs	6.4	5.9	115	Simms-Bosch h.t. Magneto	Cop. t'bs behind motor	Thermo pump	Renault parallel currents	Leather-faced cone, inverted	3 speeds, sliding gear, reverse by separate lever	Shaft	2355	112	49	Michelin dismountable	No diff'n'l, Low frame, Autom'c spark advance
Lorraine Dietrich	Renard	4 cylinders, in pairs	7.08	5.6	125	Simms-Bosch h.t. Magneto	Winged tubes	Cent'f'l pump	Lorraine Dietrich perpendicular cur rents	Metallic seg ments	3 speeds, sliding gear	Chains	2355	106	53	Michelin dismountable	D. W. F. ball bearings
Germain	Rouger	4 cylinders, in pairs	6.2	5.9	105	Simms-Bosch h.t. Magneto	Honeycomb	Cent'f'l pump	Lorraine Dietrich perpendicular cur rents	Leather-faced cone	3 speeds, sliding gear	Chains	2170	108	52	Dismountable	Low chas's, Autom'c sp'k'g ad.
Weigel	Gabraud	4 cylinders, in pairs	4.7	5.5	100	Higb tension Magneto	Cellular	Gear pump	Weigel perpendicular cur rents	Leather-faced cone	3 speeds, sliding gear	Shaft	2200	114	52	.....	Eight cylinders in one line
Porthos	Koch-Braut	8 cylinders, in groups	4.3	4.7	80	Simms-Bosch h.t. Magneto	Cellular	Cent'f'l pump	Parallel currents	Leather-faced cone	3 speeds, sliding gear	Shaft	2090	116	53	Peter Simplex	Off set engine, D. W. F. ball bearings
Brasier	Wegel	4 cylinders, in groups	6.4	5.5	120	Simms-Bosch h.t. Magneto	Winged tubes	Cent'f'l pump	Brasier convergent at 120 degrees	Leather-faced cone locking device	3 speeds, sliding gear	Shaft	2310	108	53	Dismountable	.....
Marchand	Stricker	8 cylinders, in groups	4.9	5.9	125	Simms-Bosch h.t. Magneto	Honeycomb	Turbine pump	Dufaux automatic	Hele Shaw disc steel & bronze cone	3 speeds, sliding gear	Chains	2376	114	53	.....	.....
Aquila Italiana	Baras	6 cylinders, in groups	5.1	5.5	90	Simms-Bosch h.t. Magneto	Honeycomb	Turbine pump	Automatic perpen- dicular currents	Hele Shaw disc steel & bronze cone	3 speeds, sliding gear	Shaft	2156	110	58	.....	.....
Mercedes	Batlot	4 cylinders, in pairs	7.08	5.9	130	Simms-Bosch h.t. Magneto	Honeycomb	Cent'f'l pump	Saurer pat., water heated	Spiral spring	4 speeds, sliding gear	Chains	2288	110	55	Continental dismountable	Six cylinders, in one casting
Christie	Barlier	4 separate steel jackets, copper cylinders	7.25	7.25	130	Heinz battery and coil	Winged tubes	Bucket pump	Bresse, auxiliary air inlet	Inverted cone clutches	Direct drive, one low, and reverse	Direct front drive	1780	100	53	Christie dismountable, metal spokes	Frt drive & st- ing, 4 steel cyl's, 2 throw crank

CHARACTERISTICS OF RACERS ENGAGED IN SPORTING COMMISSION CUP.

Gillet-Forest	De la Touloubre	4 cylinders, in pairs	4.3	4.7	40	Simms-Bosch h.t. magneto	Honeycomb	Cent'f'l pump	Sthenos	Metallic seg- ments	4 speeds, sliding gear	Shaft	1848	106	51	Dismountable rims	Elastic transmis- sion
Darracq	Caillous	4 cylinders, in pairs	4.7	4.7	50	Simms-Bosch h.t. magneto	Winged tube	Cent'f'l pump	Darracq	Leather-faced cone	3 speeds, sliding gear	Shaft	1265	104	51	.....	.....
La Buire	Vivet	4 cylinders, in pairs	3.7	4.7	30	Simms-Bosch h.t. magneto	Honeycomb	Cent'f'l pump	Semi-automatic	Metallic seg- ments	4 speeds, sliding gear	Shaft	1710	108	53	.....	.....
Porthos	Dumaine	4 cylinders, in pairs	4.3	4.7	40	Simms-Bosch h.t. magneto	Cellular	Cent'f'l pump	Parallel currents	Leather-faced cone	4 speeds, sliding gear	Shaft	1804	106	55	.....	.....
Hisa	Mottard	4 cylinders, in pairs	4.1	4.7	30	Simms-Bosch h.t. magneto	Winged tube	Cent'f'l pump	Parallel currents	Hele Shaw metallic	4 speeds, sliding gear	Shaft	1700	106	53	.....	V-sh'p'd h'd r'a- diator tubes on h.

The Grand Prix and the Sporting Commission Cup will be run together on July 2. All machines have pressed steel frames. Distances, 500 and 300 miles. Machines in the former event are allowed 6.6 gallons of gasoline per 62.1 miles; those in the latter race have 3.3 gallons per 62.1 miles.

AMERICANS IN BRITISH TEST.

LONDON, April 2.—Everybody was not satisfied with the flexibility competition organized by the Crystal Palace Automobile Club. The idea was good, but the rules had been too hurriedly drawn up and, as events proved, favored too much high-power machines. The program provided for a run from London to Bexhill-on-Sea, 60 1-2 miles distant, and return, to be performed on top gear. In addition all cars had to cover a kilometer flying start at highest speed, and travel over a distance of 110 yards on high gear at the lowest possible speed, it being of course forbidden to slip the clutch.

Of the fourteen entrants ten came to the starting line and there were three six-cylinder cars, six with four cylinders, and one with two cylinders. America was represented by the six-cylinder Ford and the two-cylinder Reo.

Three hours were allowed for the run to Bexhill, all cars arriving safely except the Porthos, the mechanic of which slipped while adjusting the pressure valve on the petrol tank, the car running at high speed, and had his foot crushed by the rear wheel. The mechanic got on board again, despite his injury, but the machine did not officially make the return journey. On a private motor track at the top of Galley hill the machines underwent the speed tests, covering a kilometer course. This accomplished, all attempted the slow test on the high gear without withdrawing the clutch. The event caused much interest and not a little speculation among the spectators as to the reason for a machine, which a few minutes before had been rushing by at fifty miles an hour, reducing to a crawl of four miles.

On the return journey River hill had to be tackled, which, owing to two bends about half way up, made it very difficult to climb without dropping into a lower gear. The Napier, indeed, was the only one to successfully negotiate according to regulations. The six-cylinder Ford, which up to this point had been equal to the British six, considering its lower horsepower, had to change gears and thus lost its position. The Reo, the only two-cylinder machine in the contest, did remarkably well, its fast and slow speeds being better than some of the fours, and even better than one British six, while it only had to change gears three times. The following table shows the bare results for each car; the number of points gained, which determined the official position of the competitors, is given in the last column.

Car	Fast	Slow	Engine	Gear	Marks
	Speed	Speed			
	M.P.H.	M.P.H.	Stops	Changes	
60-h.p. 6-cyl. Napier	57.69	3.48	nil	nil	
40-h.p. 6-cyl. Ford	48.38	6.36	nil	1	1,294
24-h.p. 4-cyl. Courler	46.39	5.28	3	4	844
35-h.p. 4-cyl. Maudsley	40.54	5.16	1	1	416
28-h.p. 4-cyl. Mass	40.18	6.36	1	1	917
14-h.p. 4-cyl. Vulcan	39.13	4.75	nil	2	1,133
30-h.p. 4-cyl. New Engine ...	35.29	7.70	nil	9	499
30-h.p. 6-cyl. Brooke	34.61	6.86	1	13	422
16-h.p. 2-cyl. Reo	34.28	7.03	nil	3	806
24-h.p. 4-cyl. Porthos	34.28	7.70	withdrew.		

THE BOAT RACES AT MONACO.

MONTE CARLO, March 28.—The roar of exhausts now mingles with the murmur of the waves in the cliff-bound bay of Monaco. The first trainload of racers and cruisers arrived on a special train from Paris yesterday, are now being unloaded and tomorrow will have joined their voices to those already heard in the bay. Among them are the *New Trefle*, the Brasier production; *La Rapiere*, in which Panhard and Tellier have fond hopes; the *Pcnhard-Tellier*; *Pilot No. 1*, the steel kerosene-driven pilot boat; two from the Lorraine-Dietrich factory and a few cruisers.

Daimler II. and *Daimler III.*, the two formidable British racers, arrived a few days ago and are now undergoing trials in the bay. They are looked upon as the most serious rivals to the French craft, and will certainly be difficult to beat in rough water. The two boats are forty feet in length and are both owned by Lord Howard de Walden. *Daimler II.* has three Daimler six-cylinder motors of 90 horsepower; its companion, *Daimler III.*, has a couple of 90-horsepower six-cylinder Daimler engines. *Antoinette V.*, with its light twenty-four cylinder 360-horsepower engine, built by Levavasseur, of aeronautical engine fame, has been at work in the open and has given the impression of being able to lower all world's records. Italy's hope is placed in the *Itala* to be piloted by Henry Fournier and driven to victory by a 135-horsepower *Itala* motor. The boat is now in the water, but has not yet given an exhibition of her fastest work. In addition, Fournier will have his own boat, *Itala II.*

On April 2 the boats will be brought ashore and will remain on exhibition in the open-air show one week, racing to begin on April 7. Cruisers are classified according to length and cylinder displacement; racers are in classes according to length.

According to *Herald* cable reports from Monte Carlo, the racing programme opened on Sunday with a contest for 20-foot cruisers with a maximum cylinder capacity of two liters and a half, in which twenty-one boats entered. Barely one-fifth of these succeeded in reaching home under the required conditions. *Capoulou III.*, steered by Despoujols, was the winner; second and third positions were taken by *Nautilus-Mutel I.* and *Gamine*, respectively. The winner covered the 31 miles in 26 minutes less than the winner in a similar race last year.

A 31-mile race for 26-foot racers without any engine limitation united *La Rapiere II.*, steered by Tellier; *Itala*, steered by Henry Fournier; *Fiat IV.*, steered by Gallinari; *Seasick*, with Baron de Caters at the wheel, and *La Mowvette*, with Gallice as pilot. *La Rapiere II.* finished first, covering the 50 kilometers in 50:50, or at the pace of 54 kilometers an hour. *Fiat XV.* was second in 57:36, and *Seasick* third in 1:00:50.

The general impression is that the mark boats dragged slightly, for it is hardly thought possible that the *Rapiere*, swift as she is, could have traveled at 33.53 miles an hour. A stiff land breeze caused a postponement on the second day.



CECIL EDGE IN 6-CYLINDER NAPIER.



E. A. ANTHONY AND 6-CYLINDER FORD.



H. GORDON SHARP, 2-CYLINDER REO.



TRYING out a car, as it is termed by the men in the shops, is a decidedly strenuous form of automobiling, about which the average autoist knows little and can form but faint conception. It is the next to the last step in the long process of evolution, and regardless of the painstaking care attending every advance in the constructional processes and the numerous inspections to which every component must be subjected before being approved, the manufacturer is not willing to stake his reputation on the chance of something having been overlooked—or worse, the ever-present possibility of the unseen and unknown flaw. Every part of a motor is thoroughly inspected before assembling and the motor itself is given a thorough test before it ever reaches the car, but after the latter has received all its mechanism it must be tested as a whole. It is at this point that the tester steps in; his instructions are merely to try the car out. The post is one that is sought by every man at the bench and at the machine tools, for the tester is selected for his ability as an all-around man; he is under less restraint and is better paid than the rest of the men.

Trying Out is a Gruelling Process.

As soon as the chassis is no longer the subject of attention on the part of the assemblers and adjusters, a rough, unpainted seat is bolted on it and it is turned over to the tester to be put through its paces. Rain or shine, he takes it out shortly after 7 A.M., turns up at the noon hour for lunch, and, that over, again resumes the task, which may be likened somewhat to the breaking in of a fractious colt. Though there is usually a "fleet" of these testers at every factory of importance, and they hang together more or less, the job is more or less lonesome and the tester is always glad of company—but the guest is not always anxious to repeat the experience.

One morning last week the writer turned up at the Lozier works at Plattsburg, New York, and having made his mission known to Superintendent William Perrin, was assigned to "Test Car No. 1," this being the sole mark of identification it carried.

Well into the first week in April, one might reasonably have anticipated clear skies and a balmy atmosphere, but winter lingers on the shores of Lake Champlain, much of which was still covered with sheets of ice, and the weather as well as the temperature was more fitting for December than April. Sleet and snow alternated, and, borne on a driving northwest wind, did its best to detract from the small measure of comfort afforded by the perch beside the driver. The testing car carries as its sole ornament this pair of bucket seats, with occasionally a rough box bolted on the rear to accommodate tools—of either steps, footboard or running boards it is totally guiltless. You climb up and stay there as best you may. The driver has the clutch and brake pedals to brace himself against, the guest puts his feet where he can and braces himself like grim death against the suspicion of a footboard that extends below the dash—a bare two or three inches; the rest is yawning pit in which the flywheel and clutch may be seen whirring round—so smoothly as to convey but little hint of the actual speed at which they are turning.

With a quick shift into low, third, and then high, we are off in about the space of time it takes to tell it, and the motor is picking up rapidly over the rutty and frozen road. Before we had covered half a mile I had fully made up my mind that something essential had been omitted from the make-up of that car, and that something was the suspension. Lickety, bang, bang we bumped our way over ruts and thank-you-marms, at the sight of which the average driver would immediately declutch and slacken speed, the tools rattling and banging their way around the box on the rear and the guest doing his level best to maintain an average elevation between heaven and earth which would be bounded by the upper limits of the bucket seat.

Where, Oh, Where, Are the Mudguards?

Another half mile and we are beyond the town limits of Plattsburg; the low hum of the motor takes on a more business-like buzz and the wind and sleet cut keener. Then of a sudden two



CROSSING ONE OF LAKE CHAMPLAIN'S FEEDERS.

well-placed thumps on the back cause me to whirl around in anger, despite the precariousness of my position, to see what yokel has been hurling clods at us with such good aim. Just in the nick of time to make a deft duck and let an even more generous sized one go flying over my head. The driving wheels are the guilty parties; it had been thawing for a day or two previous and now a slight freeze has just congealed the mud enough to make excellent ammunition of it. Going at but the moderate pace of fifteen or twenty miles an hour, a five-inch tire can pick up half pound and pound chunks of the unsavory mixture and hurl it with a force and accuracy of aim that are truly astonishing—to the man who happens to be in their path. I glanced slyly at the driver to see if he were enjoying my discomfort, but his eyes were all for the car and the road, while his ears were strained to catch the faintest out-of-the-way sound on the part of the motor or transmission. I noticed, too, that his coat bore the marks of many a previous plastering of the same order, and said nothing. Then in quick succession two well-directed missiles about the size of three-pound shells landed with vicious plunks on different parts of the camera and I made haste to protect the lens.

"Too much mud for you?" laconically inquired the driver.

Between holding himself and the camera within the limits bounded by the semi-circle of the seat and attempting to protect my face from the cutting wind and the flying chunks of half-frozen "goo" that were landing about me with an unholy swat every now and again, I was too occupied to indulge in needless conversation. An unusually vicious bump sent me skyward just

at that time and in coming down my head piece wagged loosely, which must have been interpreted as a negation by the driver, as he resumed the business of seeing how hard he could make the car bump over that miserable apology for a road—at least, so I judged, for it was impossible to penetrate the all-enveloping hood and goggles. Anyone who thinks such trimmings savor unduly of affectation on the part of a driver needs but to put himself in the same position to appreciate their worth. On the finished car the mudguards blend with its lines and are part and parcel of the vehicle—their true value appears when they are not there.

Scant Time to Heed the Scenery.

We were flying along the edge of historic Lake Champlain with its numerous cedar-covered islands, now on top of a ridge which commanded a sweeping view and the next moment dipping into a ravine which shut the lake from sight, or rolling smoothly across a bridge spanning one of the many streams that empty into Champlain. On the other hand, a few miles back one gets an occasional glimpse of the foothills of the Adirondacks between the rifts in the scudding gray and the swirling snow. But it is a poor time to attempt to appreciate the beauties of scenery; if it be true that the average tourist sees little or nothing of the beauties of nature as he scorches along, it is doubly so of the tester. He has an eye for nothing but the road, and those who



"HOWDY DO!" AND "GOOD-BYE!"

accept an invitation to ride with him must perforce pay attention to other things more intimately connected with their momentary welfare. Thus it is that the scenery comes in for scant attention at best; bad ruts with their twisting turns are frequently interspersed with those transverse gullies that have been so aptly dubbed "thank-you-marms," and an occasional sharp turn adds interest and variety by calling for a bit of side strain that relieves the monotony of everlastingly pushing forward with one's toes on the narrow strip of board to maintain a hold.

A swish out of the beaten rut and we have shot around one of those right-angled turns into a country cross-road. Not expecting it, I sailed skyward when we crossed the ridges of the deep rut and centrifugal force kept me heading the same way when I came down, so that my feet missed the board but fortunately landed on the frame. There is always the alternative of dropping outboard under such circumstances, or sliding into the pit formed by the pan to protect the flywheel, clutch and transmission, but whether there is much to choose between the chance of hitting the grit over hard or being assorted by the rapidly whirling machinery is a question. Neither looked particularly inviting, so I concluded that one hand was enough for the camera and supplemented my strenuous and tiring foot brace by grabbing the back of the bucket seat. Bumpety, bump we flew over the rough and little-traveled surface, heading back from the lake and straight for the mountains. Just enough snow to make things



THREE OF A KIND: TWO "FORTIES" AND A "SIXTY."

slippery and a four-foot ditch on either side of the narrow, high-cambered road added an extra spice of danger. An untimely skid bringing up in the stagnant pool at the bottom of one of those ditches would have meant the end of that test run, for little short of a derrick would suffice to get the car back on the road again. But another mile or two of it and then we began to climb a bit, soon coming out on the road to Peru, N. Y.—a little town about twelve miles from the Lozier factory. This is an almost straightaway stretch of fine, hard macadam that formed part of the route of last year's Glidden Tour. It is here that the Lozier testers make their speed trials.

The Tester Knows No Speed Limit.

I thought we had been covering the ground at a very respectable pace before, all things considered, but once on the smooth way the driver opened the throttle, notch by notch, and the car fairly jumped ahead. There was still two-thirds of the sector for the throttle to travel, but we were flying along with the wind screaming by and the fine, hard grit from the road cutting my face like a whiplash. If the car ate up distance in that fashion

another of the swiftly traveling spots; it was a third tester and his car, this time coming our way. He had a "sixty" and we but a "forty," so that there was small use in trying to run away. With a rush he swept by us and we trailed in to the finish at Peru. A quarter of an hour later a third tester dropped in and they fell to comparing cars and swapping experiences.

Several Days Required for Thorough Tryout.

From the moment that the car is turned over to the tester until having received his final stamp of approval which precedes its wash-up, preparatory to shipment, its history is closely followed. Every drop of gasoline, oil and water that it requires are recorded—every hour that it is on the road and the mileage it covers during its novitiate are all carefully noted and the finished record is of considerable interest. Several days are required to complete the process, on each of which it averages about 100 miles or more over all kinds of roads and at the highest speeds of which it is capable. It is carrying but a relatively small portion of the load for which it is designed in the shape of body and passengers and its springs are stiff.



ON PICTURESQUE CHAMPLAIN'S SHORES—THE STAMPING GROUND OF THE LOZIER TESTERS.

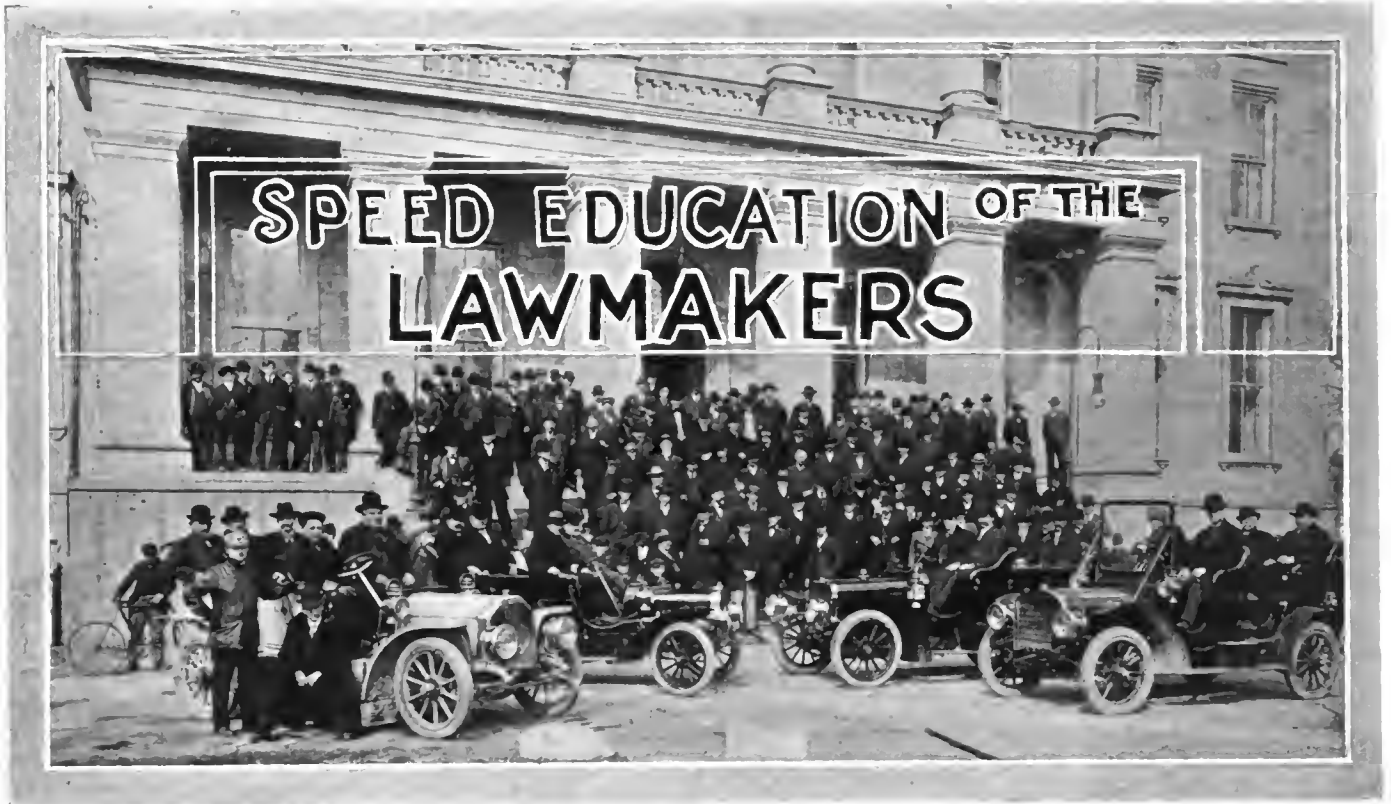
with the throttle but a third of the way open, it seemed like tempting fate to make it possible to open it any more, and I instinctively hoped the muffled and immovable figure beside me, gazing straight ahead, would at least not attempt to fracture any world's records in the same informal way that legal speed restrictions had been strewn by the wayside.

But still another notch and a further spurt on the part of the motor until we seemed no longer to be traveling on terra firma. Anyone who wishes to realize the feelings of the driver of one of the cars in the Vanderbilt Cup race can do so with slight effort—the average tester will take him along, stretch after stretch, at better than a mile per and above a certain limit the sensations become dulled; there is no further appreciation of the rate of travel, regardless of how it be increased.

We were scudding along at this rate when a spot appeared around a bend down the road and came toward us at a similar pace; it was another of the Lozier testers. The slightest nod on the part of the drivers as the sole sign of recognition and we had passed with a swirl and a rush. With confidence born of familiarity, I half turned in my seat and "rubbered" back down the road we had just come over to see how fast the other fellow would disappear. He had hardly gotten a half mile away when he met

If there are any defective leaves or poorly fastened shackles it does not seem possible that they can fail to yield to the unmerciful grueling they are put through day after day on their test; that anything loose or defective can survive this treatment seems beyond belief, for it is putting it mildly to say that in each of its seances in the hands of the tester it receives far more and far harder service condensed into a few hours than it is apt to get in the same number of days at the hands of the average owner. If the latter be sensible, he takes advantage of every opportunity to save his car and his tires, but it is the tester's business to bring out the defects if they exist, and tires mean nothing to him. Not that it is any pleasanter a task for him to jack the unwieldy shoes off and on to replace a tube than for anyone else, particularly in the nasty weather that forms a large part of his lot—it is simply all in the day's work, and unfortunately punctures are many, far too many to please either the driver or the builder of the car, but there is no way to avoid them, and in view of the test that they are put to the wonder is not that they puncture as frequently as they do, but that they manage to stand up at all.

Testing is a strenuous occupation for both car and driver, and after a car has been through such a mill it may well be said that accidents due to defective parts are unavoidable.



HOW DROUGHT TAUGHT THE LAWMAKERS.

MILWAUKEE, Wis., April 8.—Educating legislators in autoing is quite a new proposition, but it was done with some remarkably good results a few days ago. Through the efforts of the Milwaukee Automobile Club and James T. Drought, a practical demonstration was given to the legislators of what the various speeds from six to forty miles an hour really are, and the ease by which an automobile can be stopped and controlled was quite a revelation to the majority of the members. The latter courteously consented to be taken for thirty to forty-five minute spins for practical demonstrations about the city of Madison.

Mr. Drought, who planned and executed this unique campaign, earned for himself the title "Star Lobbyist" of the 1907 season. He assisted greatly in getting and keeping the legislative body in good humor, so that they managed to look pleasant when a photograph was taken. In speaking of the idea recently, Mr. Drought mentioned that much of the credit for the effective work belongs to August Jonas and his Peerless, and Frank Roesler, a seventeen-year-old driver. These two skillfully and convincingly demonstrated the claims made in behalf of the auto, and many of the legislators saw a great light.

CONNECTICUT SUGGESTS LAWS CONFERENCE.

HARTFORD, Conn., April 8.—As a result of the two recent hearings before the Committee on Roads, Bridges and Rivers of the Connecticut Legislature there may be a conference of legislators from New England and adjoining States. It was Senator H. P. Buell, chairman of the committee, who suggested the advisability of such a conference, and he has written to the Secretaries of State of Massachusetts, Rhode Island, New Hampshire and New York, looking forward to a conference in the future.

Judging from the recent hearings at Hartford, it would appear that the Connecticut State Association of the A. A. A. will be successful in securing equitable legislation, there being no outburst of hostility and the committee showing by its attitude a desire to be eminently fair from the standpoint both of the automobilist and the public. Walter S. Schutz, the attorney for the Connecticut association, is at work upon a substitute bill, and,

being particularly fitted for the task, a measure is anticipated which should be satisfactory to the legislators.

At the first hearing the speakers included Mayor George M. Landers of New Britain, who advocates a State tax upon automobiles, providing the money is to be applied to the maintenance of the State roads; J. Howard Morse, president of the Hartford Automobile Club; Frank Miller, president of the Bridgeport Automobile Club; Colonel George Pope, Pope Manufacturing Company; H. P. Maxim, Electric Vehicle Company, and A. L. Riker, Locomobile Company of America. Charles T. Terry, chairman of the A. A. A. Legislative Board, made a splendid address, which included many convincing arguments.

Connecticut automobilists are discovering that a decided sentiment seems to tend toward leaving out entirely the rates per mile per hour, and make the speed provision dependent entirely upon the width, traffic and use of the highway.

HOOSIERS MAY HAVE TO REGISTER AGAIN.

INDIANAPOLIS, Ind., April 8.—The publication of the laws passed by the recent Legislature of this State has disclosed some facts in connection with the new automobile law not generally known. The law was hurried through the closing days of the session and very little attention was paid to it.

Probably the most startling feature that has developed is the one that will require all owners to obtain new registration numbers and in all probability to pay a second fee for registration. The new law changes the system of registration and, as the Secretary of State will be required to issue a new number, it is his opinion that a new fee will also have to be forthcoming.

PREDICTS UNCHANGED NEW JERSEY LAW.

NEWARK, N. J., April 8.—This is from the *Sunday Call*: "With the exception that there are not enough inspectors to properly care for the business arising from the enforcement of its provisions, the New Jersey automobile law which was passed last year has been found to work not so unsatisfactorily as was at first anticipated. Considerable tinkering with the law, through legislative enactments this year, was proposed, but it is not likely that any will be done."

CHAIN DRIVES AND THEIR CARE AND REPAIR

By VICTOR LOUGHEED.

PROBABLY no detail of automobile construction is more strenuously defended or more decidedly denounced than the chain drive, anomalous though such a condition may seem. And concerning nothing else in motordom has there been waged so long and vigorous a drawn battle as that between the chain and the propeller shaft, which never yet has failed to furnish occupation to the statisticians of the industry.

The real crux of the matter, when all comparisons are made and inconsistencies reconciled, seems to be that a chain drive is exceedingly good or astonishingly bad, according to how it is designed and taken care of.

Types of Chain Drives.

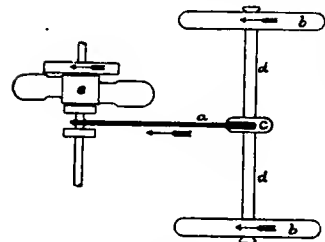


FIG. 1.

There are two common types of chain drives, the single-chain drive and the double-chain drive. The first is applied exclusively to rotating, or "live," rear axles; the second to non-rotating axles. Also, the single chain is now used only on small, light cars, while the double chain finds its chief place on the heaviest and most powerful machines.

The Single-Chain Drive generally conforms to the plan sketched in Fig. 1, in which *a* is the chain driving the rear wheels *bb*, through the sprocket at *c* on the rear axle *dd*. The motor is sketched at *e*, and it will be noticed that this type of drive requires the engine be placed crosswise of the car, so that its mainshaft is parallel to the rear axle. The drive is not necessarily to the center of the axle, as in the case pictured, some few cars having the axle sprocket located very close to one of the wheels.

The Double-Chain Drive, in its most characteristic form, is sketched in Fig. 2, in which *aa* are the chains, driving the rear wheels *bb*, directly through the sprockets *cc*, the rear axle *d* being non-rotating. The engine, *e*, is placed longitudinally in the car, so the power is communicated from it to the chains by the bevel gears at *f*, and thence by way of the countershaft *gg*, and the countershaft sprockets *hh*, which are just outside frame.

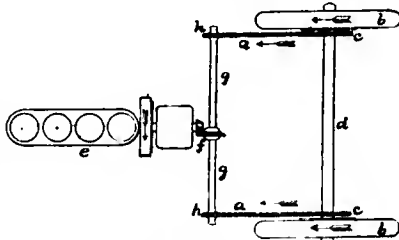


FIG. 2.

Much of the efficiency of the chain transmission is due undoubtedly to its flexibility and to the fact that it transmits power by a perfectly direct pull. A bevel gear, which has to transmit power "around a corner" cannot even in its best condition be quite as efficient as a chain likewise working in its best condition. As for the spur gear, which like the chain acts direct, its failure to show up as well in some tests may be due to the difficulty of maintaining the gears in the absolutely perfect alignment that is essential to the best results with this sort of machinery. A chain, on the other hand, will work just about as well with its sprockets material out of line as it will when every adjustment is perfect.

A great advantage of the double-chain drive is that it permits the use of a very light rear axle, which is relieved of the weight of the bevel and differential gears and therefore is little subject to the danger of bending from hammering over rough roads.

The Disadvantages of Chain Drives practically all result from the one difficulty of keeping the chains clean, though it is sometimes urged as an argument that the many parts and many

bearings of a chain constitute a not-inconsiderable complication. Also, it must be remembered that, whatever the efficiency of the actual chain drive itself, it is usually used in addition to all the gears and bearings that are present with the propeller shaft drive. The single-chain drive, of course, avoids this criticism.

The Different Kinds of Driving Chains.

There are two principal kinds of chains used in automobiles—the block chain and the roller chain. A third type—generally styled the "silent" chain—is used to some extent for a first drive from the engine, or under other conditions that permit of its thorough protection from mud and dirt.

The Block Chain is illustrated in Fig. 3, its characteristic feature being the alternation of the blocks *aa* with the pairs of links *bb*, *cc* and *dd*. Block chains are now little used for vehicle propulsion, except on bicycles and the very lightest automobiles, because when they are dirty the blocks wear very rapidly, besides wearing the sprockets in a similarly serious degree. This objection can be avoided by the use of chain boots.

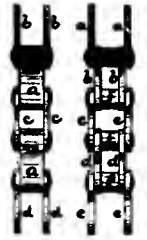


FIG. 3. FIG. 4.

Roller Chains are of the sort shown in Fig. 4, being constituted entirely of links *aa*, *zz*, *cc*, *dd*, and *ee*, with small rollers *fff*, to work against the sprocket teeth.

Theoretically, any good chain, block or roller, will engage with and disengage from the teeth of correctly-cut sprockets without any sliding contact whatever. Practically, it is found impossible to cut sprockets to such perfection, besides which, if they were so cut, the least wear would spoil them. And films of dirt between chain and teeth would cause rubbing and wear. These various difficulties roller chains overcome by providing a smooth-working interior bearing, protected and lubricated, to hold off what otherwise would become destructive abrading forces. Theoretically, the conditions should be such that the rollers would not roll, but practically they do, which proves the necessity for providing the chain with them.

Silent Chains are of the general description sketched in Fig. 5, the teeth being on the chain links and the rollers, if rollers are used, being on the sprockets. Many silent chains work on toothed sprockets. Silent chains can be worked successfully in very much shorter lengths than prove practical with other chains, and can be built to run very fast and to transmit great power. Some of them are literally belt-like in width, being composed of multitudes of adjacent links.

The Material of Chains, while always steel, varies somewhat in quality. Since the highest possible quality is to be desired, most prominent manufacturers are now making chains of the better alloy steels.

Care of Chains.

Proper care, as has been suggested, is vital to success in the use of chains. It is not enough to have correct chains and correct sprockets—proper maintenance is as important as a proper start.

Commencing with a new car, the initial tension on the chain must be maintained, despite "stretching," by occasional readjustment of the radius rods. There is no such a thing as a chain really stretching, in ordinary use, in the sense of an elongation of the metal of which it is composed, but what does occur produces practically the same effect—a hundredth of an inch

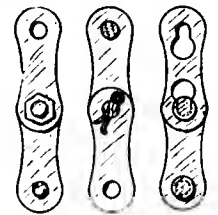


FIG. 6. FIG. 7. FIG. 8.

wear at one hundred rivets making the chain an inch longer. In time, as the chain lengthens, it will have to be replaced, because the space from the bearing point in one link to the bearing point in the next will be so much longer than what should be a corresponding space between the sprocket teeth, that smooth operation will be impossible.

Replacement, in fact, is a very good and sensible policy with chain drives, to apply every so many miles, charging the comparatively small expense against the mileage, just as in the case of tires, fuel, etc. The best modern cars now are made with readily-removable sprocket rims, so replacement of the whole driving aggregation is as simple as it is inexpensive. And certainly nothing could be more expensive than to continue worn parts in use when new ones cost very little.

Protection of some sort, as by the use of chain boots, is much to be commended from every sound standpoint, though it is to be admitted that the generality of chain boots so far produced are somewhat unsightly. A simple expedient for partially protecting chains, which has been to some extent used with motorcycles, requires only a light, soft leather belt, stretched over the chain and allowed to run with it. A belt used in this manner will form itself over the chain until it protects all but the inner surface.

The Adjustment of Chains is very important, for, though a chain will run remarkably well when out of adjustment, it will run much better when in. A very loose chain is particularly bad, because when running it whips up and down in such a way as to flex and wear the joints very considerably. It is also likely to "climb" the sprockets, through a roller or block striking on the top of a sprocket tooth, and this occurrence will certainly result in a broken chain, if in nothing worse.

A chain too tight will wear itself and sprockets rapidly through the heavy stresses it maintains on all rotating parts, and it also is likely to respond so sharply in starting or accelerating as to break through the sheer suddenness with which it takes on loads.

To adjust a chain, a safe general rule to go by is to have it as loose as it may be without its being possible with a stick or rod to pry it free from the first tooth with which it is meshed on either front or rear sprocket.

To Clean a Chain, remove it from the car and, after wiping all surplus grease and dirt that can be removed with some waste or old rags, immerse it in a pan containing gasoline or kerosene—preferably the former, if quick results are desired. After letting the chain soak long enough to loosen the dirt on it, shake it in the fluid, or, if necessary, brush it with a coarse brush, until it is perfectly clean and every link works freely. If very dirty, a final rinsing with gasoline—whether this fluid or kerosene is used for the first bath—will expedite matters. When the chain is dry, it must be lubricated, preferably by working it around in a molten mixture of tallow and graphite—a compound that is to be had of any dealer in automobile supplies. In this way a sort of a bushing of graphite is worked into each joint, where it will remain and lubricate for thousands of miles.

Spare Parts for Chains, in the way of extra links, rivets, etc., always should be carried. Even a complete extra chain does not weigh much nor occupy much space, and always is likely to come in handy.

Chain Fastenings, by which the chain can be separated to remove it, take various forms. That shown in Fig. 6 is very common and very simple, consisting of a small bolt in place of one of the rivets, with a hexagon nut that can be easily removed. The system shown in Fig. 7 is in a way similar, except that an

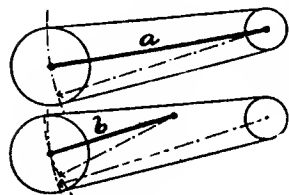


FIG. 9.

elongated rivet is used to link together the chain ends, and is itself held in place by a split pin passed through a small hole in one end. The links in Fig. 8 are alternately provided with slots and headed rivets, so that they can be put together or taken apart by hand, but cannot separate when the chain is under tension.

Oftentimes, when a chain has stretched considerably, it becomes necessary to remove one or more links after the radius rods have been lengthened as far as they will go. To do this, it probably will be necessary to file off some rivet heads, unless the chain is made like Fig. 7 or Fig. 8 throughout its length, in which case the task is a simple one. Be sure not to remove a link before ascertaining whether or not its removal will shorten the chain more than can be allowed for by shortening the radius rods.

The Radius Rods and Their Adjustment.

Radius rods or some equivalent are necessary with all chain drives, to maintain a proper distance between the driving and the driven sprockets. The forward end of a radius rod should be pivoted at or very close to the center of rotation of the front sprocket, as sketched at *a*, Fig. 9. If pivoted as at *b*, Fig. 9—a construction seen on some old cars—the axle will swing along an arc different from the one that would keep the chain at the same tightness, as is shown by the dotted lines.

Radius-Rod Bearings require more attention than is commonly considered necessary and are adjustable or arranged for rebushing on many good cars. The constant motion wears them rather fast and when they are loose they cause a



FIG. 11.

destructive and annoying pound. Regular lubrication, preferably by a grease cup, is desirable.

Springs as Radius Rods are a not uncommon construction, as is shown in Fig. 10, in which the quarter-elliptic spring *a* serves to maintain the chain distance, its movement being practically along the dotted line *bc*.

The Adjustment of Radius Rods usually is effected by a turnbuckle, as at *a*, Fig. 11, or by a screwed-in end, as at *b*, Fig. 11. It is very important not to get the radius-rod adjustment on one side different from the other and if the chains vary in length it is better to have one too loose or too tight than to correct it by putting the rear axle at other than a right angle across the car. Measuring with a tape from front hubs to rear hubs will disclose any error in parallelism between the axles, if the steering is set for straight ahead.

Concerning the Sprockets.

Sprockets, like chains, should be kept as clean as possible, and renewed when worn. Some sprockets are made to reverse, so that they can be turned around and both faces of the teeth used. It is also important to keep sprockets as nearly in line as is possible, though a slight twist in the chains is unavoidable in running over rough roads, or if the rear wheels are cambered and the countershaft is straight. On some cars the countershaft sprockets are allowed some end play on squared shaft ends, to maintain alignment in swinging around curves.

Sprocket Size is very important—the larger the sprockets are within certain limits the better. Large sprockets increase chain speed and reduce chain pull for a given effort transmitted. Besides this, they reduce the angle or flexion between chain links, as shown in Fig. 12, in which the lines *a b* show the bending over a small sprocket, and the lines *c d* show it over a large sprocket, the gear ratio being the same in both cases. This point is of very great importance in reducing chain wear, because such wear is very closely in proportion to the amount of bending in passing over the sprockets. With larger sprockets all trouble from this source disappears.

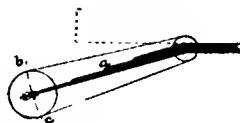


FIG. 10.

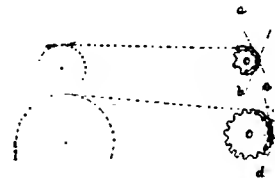


FIG. 12.

LETTERS INTERESTING AND INSTRUCTIVE

Information Wanted Regarding Lava and Porcelain.

Editor THE AUTOMOBILE:

[690.]—Can you tell me through the columns of your paper the following:

What is lava as used in insulators for jump-spark plugs? What is the formula to make same in such forms; how is it hardened and by what process; how do they put a fireproof glaze on porcelain plug insulators, and what degree of heat is used, and what is the mineral used to make such a glaze; why is not lava better than porcelain, and which is the harder? Why is not lava more used than porcelain for automobile plugs?

A detailed answer in your next issue will be appreciated.
Buffalo, N. Y. W. De S.

We find your questions are somewhat out of our province and can hardly give explicit answers, but have no doubt that some subscriber to whose notice this comes may be able to supply the information desired. We have no idea as to the ingredients used in the composition of what is commercially known as lava, except that it is a sort of artificial stone, nor as to the process it goes through, but are under the impression that it is a proprietary compound and that the formula is a trade secret. There are innumerable formulæ for hard porcelain glazes such as you mention, according to the purposes for which the article is to be used, and according to the maker. The following is said to produce a very hard glaze, capable of standing a high temperature: Feldspar 18 parts, Cornwall stone 3 1-2 parts, whiting 1-1-2 parts, oxide of zinc 1 1-2 parts, and plaster Paris 3-4 part; we do not know how high a temperature is used. We do not know to a certainty, but think porcelain is the harder of the two, and have no idea as to why lava should not be the better material for the purpose. Your next question would appear to carry, not alone its own answer, but that to your previous one; we presume that if lava were a superior material from which to make spark plugs it would be used more commonly than porcelain. However, lava has been tried in several instances, so we have no doubt some reader who had had experience with plugs of this kind will come to our rescue by supplying a little more definite answer to the foregoing questions.

Some Queries Regarding a French Motor.

Editor THE AUTOMOBILE:

[691.]—Will you kindly explain under "Letters Interesting and Instructive" of what particular use is the communicating pipe "K" in Fig. 1 of motor under head "A New French Recruit to the Two-Cycle," on page 563, in the issue of March 28. Does the compression in "E," caused by the downwardly-moving piston "A," have any tendency to push down the second piston "B"? If not, would not two openings, one on crankcase and one at high point of entrance of pipe "K" be equally satisfactory?

Then again, what means are taken or could be taken (to advantage) to lubricate the inner wall against which piston "B" is bearing?

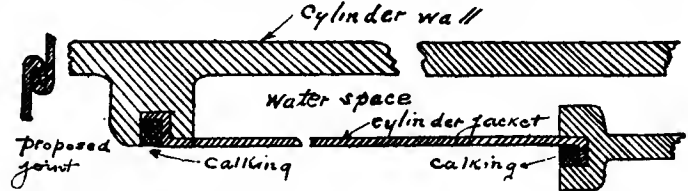
B. M. C.

The object of the pipe *K* is fully explained in the last paragraph of the description referred to, on page 554, in the issue mentioned. We presume the crankcase compression at *E*, caused by the descent of the piston *A*, may have a slight effect on *B*, particularly as the latter causes a certain amount of depression which would tend to increase this action. However, as mentioned in the description, its sole object is that of lubrication; as also outlined in the former, the oil in the crankcase is relied upon for lubrication almost entirely, by splash for the connecting rod ends and by means of the oil carried through *K* by the air circulation for the pistons. Just how this oil is brought into contact with the wall *F* against which *B* bears, does not appear, nor is there any mention made of it in the original French description, which leaves considerable to be desired in the way of detailed explanation.

Putting Copper Water Jacket in Place on Cylinder.

Editor THE AUTOMOBILE:

[692.]—Will you kindly let us know what you think is the best method of attaching an independent copper water-jacket as per accompanying sketch? The cylinders are cast in pairs and the jacket is too small to slip over either the base flanges or the heads



VIEW OF PROPOSED METHOD OF JACKET ATTACHMENT.

on account of the valve pockets. Would you wrap the jacket round the cylinder, making a double seam where the ends meet, and then calk the upper and lower edges into the grooves on the cylinder?

R. W. B.

Bryn Mawr, Pa.

It looks very much to us as if one or the other part of your design would have to be altered in order to carry out the project of using an independent copper water jacket as you propose, as we cannot see how you are going to make a serviceable joint in the jacket itself after wrapping it round the cylinders as you mention. It may be possible to do it, but considerable sleight of hand would be required, and it is doubtful if a good job could be made of it in this way. This would constitute a weak link in the jacket, even if it could be done without a great deal of trouble. It is customary under the circumstances, to make a jacket of one piece so as to be seamless, and slip it on over the lower ends of the pair of cylinders. Either a copper or a soft steel ring may be used for calking, this usually being seated under heavy pressure.

Obtaining Calorific Values of Different Fuels.

Editor THE AUTOMOBILE:

[693.]—Will you kindly inform me how or what formula was used to obtain the B. T. U. which is published on page 469, issue of March 14, in which is given acetylene equals 21,492 B. T. U. when it equals C_2H_2 and gasoline as 21,900 B. T. U. when it equals C_8H_{18} , alcohol equals 28,500 B. T. U. when it equals C_2H_5O , the alcohol must be less owing to the presence of oxygen.

Formulas for the three liquid fuels:

First: $8080C$ plus $34.462H$ per kilogram.

Second: $8080C$ plus $34.462 (H \text{ minus } 1/8 O)$.

Is not this correct?

R. C. MATLACK.

Chicago, Ill.

Your question as to what formulæ were used in obtaining the calorific values you mention is somewhat puzzling. We have never heard of the use of formulæ in this connection, the heat values of different fuels being obtained, as a general rule, by actual test with the aid of a calorimeter, of which the Junker and Sargent instruments are familiar examples. The alcohol referred to on this connection was absolute alcohol and, in consequence, of a very much higher heat value than ordinary commercial alcohol.

Bicycle Not a Good Foundation for Motorcycle.

Editor THE AUTOMOBILE:

[694.]—Will you kindly answer the following questions through your valuable journal and oblige a "would-be motor-cycle builder"?

I have a 1906 model Spalding (Nyack) bicycle, and am contemplating adding a gas engine later in the summer. Do you think the frame of my bicycle is strong enough to hold a gas engine, or would it be necessary to add an additional frame of strong iron pipe, or similar material, suspended from some point near the crown of the frame or the hub of the rear wheel? What would be the best means of transmitting power to the rear wheel? I have a coaster brake. Would it be possible to have a coil spring between

the front fork and the crown of the frame to avoid jars and vibration, or would you consider it more advisable to use a new front fork? Finally, where could I get such an engine that would fill the bill as to weight, etc.? Also, have you any idea as to the price of same, and could it be done any cheaper than to buy a second-hand motorcycle?
H. HART.

New York City.

We should certainly not recommend you to attempt to convert an ordinary bicycle into a motorcycle, for reasons which should be apparent to you on a moment's consideration. Take the matter of weight alone, say your bicycle weighs 25 pounds; the average light motorcycle weighs 110 pounds, more or less, so that it will be evident there is nothing whatever on your present machine designed to carry this weight, not to mention the vibration, which is a very important factor. You would need new spokes, new rims and larger tires as well as a new front fork and a new frame; after deducting these from what you have, it will be somewhat difficult to find any foundation left upon which to build a motorcycle. Of course, it is possible to strengthen the frame you have, but iron pipe is not exactly a suitable material for the purpose; your present wheels and tires might also stand the racket for some time, but the machine would be a poor one at the best and apt to prove dangerous, if it ran very long without shaking to pieces. Buy a second-hand motorcycle, and even though you have to be content with one of two or three years ago, you will doubtless find that its designer knew more about building them even then than you are apt to have acquired through observation; what is much more to the point, you will be considerably in pocket.

An Air-Driven Aspirant for Vanderbilt Cup Honors.

Editor THE AUTOMOBILE:

[695.]—Will you kindly answer the following questions in your "Letters Interesting and Instructive" column?

(a) Would a four-wheeled machine driven by air propellers and fitted with a type of aeroplanes for assistance at corners be classed as an automobile, and would it be eligible to enter the coming Elimination trials for the next Vanderbilt Cup?

(b) Would such a machine or would a car be allowed to carry three men in the race?
McG. D. & CO.

Philadelphia, Pa.

(a) As there is no precedent to be guided by in the matter involved in your first question, we can only give an opinion, but as there is nothing in the rules that prescribes the form of power nor the manner in which it is to be used to propel the car there seems to be little doubt but such a machine as you mentioned would be eligible.

(b) The rules restrict the crew of the car to two—the driver and an assistant or mechanic.

Unequal Compression in Two-Cylinder Motor.

Editor THE AUTOMOBILE:

[696.]—Will you kindly give me some information on the following: A customer of mine has a two-cylinder runabout; several months ago he scored one cylinder; I have had that rebored, now I do not get the power that I ought to. One cylinder is 1-8 of an inch larger than the other, yet I get the most power from the small cylinder. This car has only one carbureter; according to my idea I can't adjust the carbureter to suit both cylinders. I get good compression on both cylinders. Do you think by putting on double carbureters I will get the original power?

Columbia, S. C.

A. T. GIBBES.

We do not favor the idea of two carbureters, as it is extremely difficult to synchronize them so as to get the same results from each cylinder, the only designer that ever resorted to this expedient discarding it after two years' use. While you state that the compression is "good" in both cylinders, with nothing further to go by we are inclined to the opinion that it is not as good in the cylinder that has been rebored as it is in the other, and the only way to test this would be either by using a gauge or taking indicator cards of the two cylinders. The fact that one cylinder is an eighth of an inch larger than the other has little bearing on the case if the compression is poor in the larger one. You

do not mention anything about a new piston being obtained for the larger cylinder after the reboring operation, and if this has not been done no doubt the trouble will be found there. At all events it would do little or no good to multiply evils by attempting to make two engines out of one, which is virtually what you would be doing by using two independent carbureters.

Use of Pickling Solution as a Scale Remover.

Editor THE AUTOMOBILE:

[697.]—In a recent number you advocated the use of a 10 per cent. oil of vitriol (sulphuric acid) solution to clean radiators. Are you sure of your facts in this case? Even 10 per cent. oil of vitriol is very corrosive, it being the most corrosive of all our acids, and it seems to me that it would attack the copper and the solder of the radiator and the iron of the cylinders vigorously and do harm rather than good. If I am right, the recommendation by so prominent a journal of this measure would injure many cars. Please investigate your facts and let me know your results. The only other thing which I know of that works well is a strong solution of carbonate of soda, the washing soda of our household, not the bicarbonate, which is cooking soda.

Asheville, N. C.

CHAS. L. MINOR, M.D.

You are quite correct in stating that even a 10 per cent. solution of sulphuric acid is quite corrosive and will attack metal vigorously, but before it reaches the metal it must attack the furring or scale, and if the draincocks be opened occasionally and the solution drawn off as previously recommended, there is no reason why any injury should accrue. Naturally, if such a solution were poured into a radiator and permitted to stand over night, damage would be apt to result. The mixture is what is known as a pickling solution and is very largely used, particularly by electro-platers, for cleaning articles of brass or copper preparatory to plating. We do not recall the letter in the answer to which the statement you take exception to occurred, but if we remember aright, the request was for a cleaning solution that would be effective in a bad case. Carbonate of soda, especially when used hot, is an efficient cleaner, but there are probably many forms of deposits, such as those resulting from the extremely hard waters prevalent in the West, which would not be affected by it. If you wish to satisfy yourself that such a solution can be put into a radiator with perfect safety, make up some of it in a glass and put a few small pieces of sheet copper, brass and cast iron in the latter, and note the length of time it is possible to let them remain without being seriously corroded. Unless we are mistaken, we believe we recommended the inquirer to draw off some of the solution from time to time to note how it was working and to empty it out as soon as it ran clear, subsequently flushing the circulating system out thoroughly with fresh water to remove every trace of the acid.

What Causes One Cylinder to Make More Noise?

Editor THE AUTOMOBILE:

[698.]—I run a four-cylinder car of popular make, and of late I have discovered that one explosion of the four is considerably louder than the other three. This louder explosion is very much in evidence when the car is climbing hills on the high gear. I know which cylinder gives the louder explosion, which is No. 2, as I have held down the vibrators one at a time and when I hold down the No. 2 vibrator the loud explosion ceases. I thought it was the vibrator spring, so I put a new one in, but it did not help matters at all. I also have tested the plug in cylinder No. 2, and found it all right. If you can give me any light on the cause of this trouble I will be greatly obliged.

Westfield, Mass.

LELAND M. GILMAN.

Though apparently simple on its face, this is in reality a somewhat puzzling thing to account for. If the cams be not made integral with the camshaft, we should suggest taking a look at the latter at the cylinder in question. It may be either that the inlet cam has been shifted somewhat so as to give higher compression and a more violent explosion, or, what seems more probable, that the exhaust valve may have been moved slightly, causing it to open in advance of the

time intended, thus releasing the burning charge at a very much higher pressure than is the case with the other cylinders and making a correspondingly greater amount of noise. Then again, there may be a leak in the exhaust manifold at that cylinder, permitting the escape of the burning charge there, which would tend to make the explosion of that particular cylinder much more audible than the others. Naturally, the foregoing can only be surmises under the circumstances, and we should like to learn what you find to be the cause of the trouble.

The Easiest Way to Repaint an Old Car.

Editor THE AUTOMOBILE:

[899.]—I have a Pope-Toledo car with part of body aluminum, from which the paint or enamel is scaling off. I wish to have it repainted, but being too far away from skilled workmen in this line, I would be very thankful to be informed through "The Automobile" under the heading "Letters Interesting and Instructive" whether there are any prepared paints or enamels to be had that will wear and look well, and which can be applied by a fairly good carriage painter. If, in your opinion, there are such paints on the market, kindly give me the address of some firm in Chicago or Minneapolis from whom the same may be obtained. Also, will you kindly inform me thoroughly about the different coats, from prime coat to finish, and how best to remove the old paint.

Anamoose, N. D.

D. BRENDEL.

There are no doubt many good prepared paints and enamels on the market; you will find some of them advertised in our columns; write to the makers direct. We cannot recommend any of them from personal experience. Good carriage painting involves not only a great many coats, from ten to twenty or more, but also a great deal of care, and the directions involved would greatly exceed our space limits in this department, beside which we hardly think the subject is one of sufficient general interest to our readers. We should recommend buying a book on the subject. Unless you have a considerable fund of patience and leisure time, we should not recommend undertaking the job at all, as it is a very tedious one at the best. The easiest way would be to remove the body and ship it back to the factory, if the latter will do such work; if not, to the nearest carriage painter.

Christie Racing Car Steers by Front Wheels.

Editor THE AUTOMOBILE:

[700.]—Being a reader of your paper, I take the liberty of asking a few questions: Can you tell me whether the Christie car in the last Vanderbilt race steered with the front wheels, or did it steer with the rear wheels?

HARRY WALLACE.

Brooklyn, N. Y.

The Christie racing car referred to in your letter was steered by the front wheels the same as usual, as in fact has been the case with all the cars built by this designer, so far as our knowledge goes.

AN AMERICAN'S ADVICE TO THE "INVADERS."

Editor THE AUTOMOBILE:

[701.]—The American invaders do not expect to be received with open arms, of course, by their European confrères. However, I doubt if they quite realize the degree of hostility that the proposed invasion has provoked among the automobile clubs, as well as among the trade.

As an American automobilist living in France, I can only hope that the coming invasion will hasten the day when American automobiles will be found for sale in every French town. That would mean that the price of French cars had descended from its present lofty altitude.

When I look over the advertisements in "The Automobile" and see the ever-increasing numbers of high-powered runabouts and touring cars offered for sale at what seem here to be incredible prices, I sigh and think of what my poor little 10 horse-power runabout cost last year. The only consolation is that the same runabout costs \$500 more this year than last!

Thus the prospect of being invaded has my entire sympathy.

Judging from the comments of the Parisian press, our American invaders must not look for any good will or kind feeling,

either from the A. C. F., the trade, or from the police. I would, therefore, in friendship advise them to remember once they are in the enemy's country to be very careful not to fall into the hands of the cruel gendarmes nor of the rural gardes-champêtres, who, they may rest assured, will be in ambush for them. Let them make doubly sure that their "papers" are en règle: let there be no racing, especially through villages, and may they halt at the first intimation of anyone, in uniform or not. Otherwise they will make the acquaintance of the "contravention au vol," or, in other words, have their numbers taken, to be followed later on by arrest and fine.

Many villagee in Normandy, about here, have speed-limits of from 8 to 10 kilometres (5 to 6 miles) per hour. Here is where the wicked invaders are going to come to grief unless they are careful.

I do not wish to frighten any timid invader by speaking of Spanish roads, customs, and regulations. By the time they have got across France they will be sufficiently chastened and subdued to submit to anything!

I hope to be on hand at Havre when the invasion arrives. The city will not be illuminated, nor will there be fireworks, but we'll be there just the same!

This time next year there will be a lot of Americans who will know more about Europe than they do now!

As to whether the invasion will result in establishing a trade in American cars, remains to be seen. The French manufacturer already fears the coming of American competition. He is hoping that the poor performance of the American cars will react in his favor. At all events he has decided to ignore the invasion and to kill its evil effects by a "conspiracy of silence," in which he is being aided by the French press, automobile and otherwise.

Let us hope that he will be disappointed and that we soon may see the Avenue de la Grande-Armée lined with American auto shops filled with the marvelous runabouts of our dreams.

Vernon (Eure), France.

PEDALS.

A TANGIBLE OFFER OF HELP FROM KANSAS.

Editor THE AUTOMOBILE:

[702.]—In regard to a communication on page 515, of your issue of March 21, wherein a party from Baltimore, Md., signing himself, Subscriber, complains about carbon forming on the cylinder heads and pistons of an automobile motor, and asking for a preventive therefor, wish to say that while we do not know of any method of preventing this carbon from accumulating, we have found a very simple method of removing it from our own engine, and if his engine has the spark-plug in the center of the cylinder head, he can remove the carbon with a simple tool made for the purpose, in not to exceed ten minutes' time.

If the party has an engine with the spark-plug in the center of the cylinder head, we would be only too glad to send him instructions for making a tool to remove this carbon, or would loan him ours for trial use, in case he would pay the charges back and forth on the same, which would not exceed 25 or 30 cents by mail.

The writer never saw such a tool advertised, and does not think that there is one in existence, except the one he had made.

If all manufacturers of automobiles would make an opening in the center of the head of the cylinder of the dimensions and thread of a spark-plug, whether they used it for inserting the spark-plug or not, the matter of removing the carbon from the piston head would be reduced to such a trifling matter, and yet of such vital importance to the owner, the extra expense and trouble for so making the cylinder would more than be compensated for many times over.

Topeka, Kan.

J. M. PADGETT.

ANOTHER EXPLANATION OF THE MYSTERY.

Editor THE AUTOMOBILE:

[703.]—In answer to letter No. 636, in the issue of March 14, I would say that I have experimented to quite an extent with acetylene gas and generator, and find that acetylene gas leaves an explosive deposit on brass, copper, and silver, which will explode under very slight friction. This deposit seems to be greatly increased if the generators are overworked and the hot, freshly generated gas comes in contact with any of these metals.

This certainly was the cause of the explosions which occurred while Mr. Burtise was bending the copper tubes.

The writer was quite badly burned at one time, five or six years ago, while removing a copper spray pipe from a large generator, the deposit igniting causing the gas to explode, and has since often wondered why generator manufacturers use so much brass and copper under such circumstances.

I would, also, like to ask you how much loss of power there would be in compressing air in a receiver and using it in a simple engine such as is used for steam.

Hovington, Kan.

F. R. COVERT.

AMERICAN MAKERS AND THE EUROPEAN MARKET

R. E. MANSFIELD, U. S. consul at Lucerne, Switzerland, finds that the completion of plans for an American automobile tour through Europe this coming Summer has aroused unusual interest among European manufacturers and dealers in automobiles, concerning which he writes:

"Periodicals devoted to the automobile trade are sounding serious notes of alarm concerning what they are pleased to designate as 'the American automobile invasion.' It is not the tour alone that is causing the protest, but what is regarded as the 'presumption' of American manufacturers, who announce their intention of entering into competition with continental cars in the foreign field. There is a present and constantly increasing demand on the Continent for light and inexpensive motors, a type of car common to the American trade, but one that has up to the present been little exploited in Europe.

"In the construction of big, powerful, and expensive cars, France has always maintained the supremacy; but the increasing and almost universal interest in automobiling, especially in Europe, where good roads invite all classes to indulge in the pleasures of motoring, has created a demand for lighter and less expensive machines. This demand is practically ignored by the European, and especially the French manufacturers, and people who are anxious to enter the arena of the automobile world, to enjoy the delights of motoring at a nominal expense, are looking to America to supply the demand.

"The American manufacturers have arrived at a period when, by standardizing, they are in a position to turn out a machine better calculated to meet the requirements of the motorist, who uses a car for ordinary touring purposes and is content to travel at an ordinary speed, than are any of the European manufacturers, and at a lower price. If good, reliable, serviceable cars of from 12 to 16 horsepower, with touring body, hood, lamps, and tools, complete, can be placed on the European market at a cost of, say, from \$1,200 to \$1,800, according to style and finish, they will prove popular. It is a significant fact, and one that argues well for the American automobile, that many of the European factories, and especially the most modern plants, are equipped with American machinery and tools for the construction of motors.

"The prejudice against American automobiles which exists generally throughout Europe has been created and is maintained

largely by the continental manufacturers. This prejudice, which will continue as a factor in the trade for some time, can only be overcome or eliminated by a combined and systematic effort on the part of American manufacturers. It would not, perhaps, prove profitable for a firm representing one make of machines to establish agencies at various central points throughout Europe, but a general automobile agency representing several American manufactories could establish branches on the continent, where various types of machines could be kept on exhibition and where repairs and supplies for the motors might be kept in stock.

"Provision for promptly supplying repairs and replacing parts for damaged or broken machines is an important factor in considering the automobile trade in Europe. In the event of accident or damage to an American car, if there is no place where the repairs can be promptly supplied, the result is much delay, annoyance, and expense to the owner, which serves to strengthen the claim of the local dealers and manufacturers that it is advisable to purchase a motor manufactured on the continent, where repairs can always be promptly secured. For this reason continental agencies for American machines and supplies should enter into the calculation in the plan to invade the European market for automobiles.

Swiss Automobiles—Zurich Exhibition.

"There are in Switzerland many manufactories engaged in the production of automobiles, but there are no statistics available giving the number or value of motors produced annually in the country. The majority of the Swiss cars are high grade and also high priced. They are constructed especially with the view to ascending steep grades, as the country generally is hilly and mountainous. The automobile industry in Switzerland, while comparatively new, is making rapid progress, several new manufactories having been established within the last year or two. Among other machines produced in the country are various types of motor buses and wagons for transporting freight.

"The manufacturers of automobiles in Switzerland will give an exhibit in Zurich about the middle of May, which will be limited to cars made in the country. A list of automobile manufacturers and agencies in Switzerland is forwarded for the information of those who may be interested." [Copy of list may be obtained from the Bureau of Manufacturers.]

TAXIMETERS RENTED TO BERLIN CAB COMPANIES

CONSUL-GENERAL A. W. THACKARA, in answer to a Chicago inquiry, reports as follows on the use of taximeters on public carriages in Berlin and other German cities:

"With the exception of one firm, the manufacturers of taximeters do not sell the machine outright in Germany, but rent them to the cab companies or to the individual cab drivers. The rental is 5 marks (\$1.19) per month for horse cabs and 7 1-2 marks (\$1.78) for automobile cabs. For these rates the manufacturers deliver the taximeters to the cab owners and guarantee to the city authorities the perfect operation of the machines. The taximeters are given to the cab owners sealed, and neither the cab owner nor the driver is allowed to open the machine, such an action being punished by the authorities as a criminal offense. When the machines require repairs they must be returned to the manufacturers or their agents, who break the seals, make the repairs free of charge, and deliver the taximeters again sealed to the cab owner. To save time the taximeters requiring

repairs are left with the manufacturer or agent, who immediately replaces them with machines which are in good condition.

"The renting system is considered in Berlin as the most satisfactory for all the parties interested. The city authorities are insured against the possibility of the machines being tampered with by the drivers or owners of the cabs, the public is insured against overcharge, and the honest cab owners feel that they have nothing to do with repairs or care of the machine. Naturally the dishonest cab drivers prefer to own their own taximeters. When sold outright the prices for taximeters range from 200 to 400 marks (\$47.60 to \$95.20), depending on the number of schedules or combinations required."

June 1 to 17 has been settled upon for St. Petersburg's first auto show, to be well attended by the majority of the leading French firms. Italy, Belgium, and Germany, too, do not intend to be out of the running.



MA RTINI is a mountain car. The designation does not imply a freak machine built for impossible grades, for, as every student of European automobiles is aware, Martini is an automobile built on correct lines by the most skilled mechanical ability of Europe. Everywhere, however, is evidence of the hilly district in which it has its origin. Nothing is more calculated to develop good points in an automobile than a mountainous region, and it is these points which the Martini has inherited from its native Switzerland. In New York the machine is now handled exclusively by Palmer & Christie, of 239 West Fiftieth street, who are sole agents for the United States and Canada.

In this country the fifty-horsepower model is being sold in preference to the two smaller types constructed by the firm. With a wheelbase of 124 inches this gives room for comfortable side entrance open or closed bodies. The chassis is of pressed steel, narrowed in front to give easier turning and has pressed steel sub-frames, on which are mounted engine and transmission gear. Springs are long semi-elliptic both in front and behind with a transverse spring in the rear. This gives such an easy suspension that shock absorbers are unnecessary.

Engine. Cylinders, which are cast in pairs, are 4.9 inches bore by 5.9 inches stroke. The engine runs at 1,200 revolutions, is capable of being throttled down to 60 revolutions a minute and develop normally fifty horsepower. Valves are on opposite sides, mechanically operated, and all interchangeable. Timing gears are completely inclosed, run in oil and being fibre against bronze are very silent. Large inspection plates are provided in the crankcase, and the lower half of the crank chamber is readily dismountable without disturbing the crankshaft.

Ignition. A low-tension Simms-Bosch magneto driven off the inlet valve gear supplies the current for the make and brake ignition. Each cylinder is provided with a cut-out for verifying the individual units.

Water circulation is assured by centrifugal pump driven off the exhaust valve gear. The radiator is of the honeycomb type with a fan behind it driven by a belt off the main shaft;

the fan bearings are mounted on an eccentric permitting the regulation of the tension of the belt. The flywheel is also fitted with a fan. A cooling system capable of the hardest mountain work is one of the features of the Martini construction.

The carbureter is conveniently located on the right hand side of the engine, with induction pipes leading directly up from the mixing chamber to the two sets of cylinders. It is fitted with

an automatic air regulator, has a gauge screen to air inlet and is heated by a hot water jacket. By means of a small lever on the dashboard the supply of gasoline can be cut off between the float chamber and the mixing chamber, allowing pure air to be drawn into the cylinders and the motor used as a brake. The gasoline tank, carried at the extreme rear of chassis, is under pressure and is provided with a gauge indicating the exact amount of fuel. The gasoline is filtered before reaching the carbureter.

Clutch and Transmission. In the latest Martini model the clutch is of the leather-faced cone type, with a layer of rubber under the leather to give a more progressive hold. Transmission is through a countershaft, with drive to rear wheels through heavy side chains. The gear box is mounted on a sub-frame and provides four forward speeds and reverse, with direct drive on the high gear, all operated by a single lever with locking-gate device. The usual cardan joint is provided in the main shaft from engine to gear box. Ball bearings are employed throughout in the transmission gear, but are not used in the engine.

Brakes. The braking system of the Martini is the nearest approach to perfection it is possible to obtain. In addition to the arrangement already mentioned, by which the motor can be used as a brake, there are two powerful double-acting band brakes on the countershaft operated by separate foot pedals, and internal expanding brakes on rear wheel drums operated by a side lever. All brakes are steel on iron, and the pedal operated brakes are water cooled. If desired, the side lever for the rear brakes can be made to declutch the engine before applying braking power.

Lubrication is well thought out on the Martini. An automatic injection of oil to the four cylinders simultaneously

NO LAW FOR THE KING'S AUTO.

By PHARE.

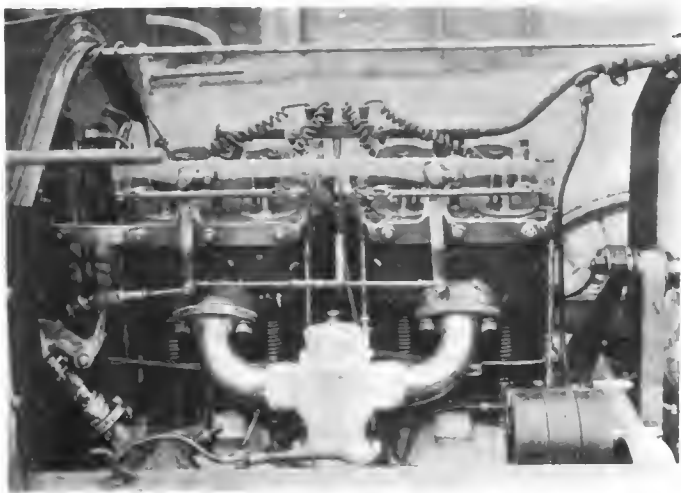
PARIS, March 28.—The King's auto! What a degree of importance attaches to this designation. The Royal Motor Car! What an amount of privilege and prerogative is wrapped up in this titular term. Ordinary automobiles may fill the street and puff their petrol fumes into the nostrils of the entire population without securing any attention at all, aside from the instinct of self-preservation, but when the Royal or Imperial auto comes into sight it becomes what is known in journalistic eloquence as the "cynosure of all eyes" and looms up, by comparison, like a brand new buggy at the Ebenezer fair. The King's auto has more rights and privileges than a fire engine. It can do no wrong. If the Royal auto damages property or kills kids, the damagee or victim is royally honored, the amount of royal smashup or agony depending upon the altitude of the Royal Highness in question. To be run over by the regal limousine of a First Class Power is a high distinction, but to have your breast bone caved in under the touring car of a cheap republic or protectorate is only a vulgar street accident.

The carrosserie of the Royal auto corresponds to the body-work of the ordinary motor car, the difference being only in the name. The carrosserie of the Royal auto bears the crest of His Royal Highness. The Royal auto looks like any good-looking motor car until you come near and observe that it is labeled with a crest and no street address, instead of the name of Hank Hancock, with the street designation of 22 rue Skiddoo.

One of the European Royal Highnesses recently visited Paris—a frequent occurrence, moreover—and his chauffeur, while driving about the streets, was halted by the police and severely interrogated regarding his papers, of which he had none, and also with reference to his driving on the wrong side of the street. He couldn't speak the language, so he was marched off to the police station, where the usual explanations were given. By means of an interpreter it was soon ascertained that the prisoner was the King's chauffeur, the Royal driver, the pilot of His Majesty. Consternation among the police authorities! Humiliation for the policeman who made the arrest! Apologies and excuses! A terrible error had been made. The Royal chauffeur was at once allowed to proceed, and, as for his papers, permit to circulate, or privilege to drive on the right or wrong side of the avenue, all laws were off. As a matter of record, no experience of this kind happened to the chauffeur of the Royal Highness who recently visited Paris, but the fiction of it made an appropriate paragraph for one of the daily papers, showing how important are all things connected with the Royal auto.

THE POLICE AND THE MOTOR OMNIBUS.

Much has been written recently on the subject of the self-propelled omnibus, its advantages, disadvantages, and how it should be operated, says *The Engineer*. London has now over 850 of these vehicles on the road, and it must be admitted by the most biased critic that there has of late been a marked improvement in their working. The smoky exhaust which a few months ago was all-pervading has now ceased to exist to any considerable extent, while the noise of grinding gears and rattling bonnets has been greatly modified. Although the motor omnibus engineer has to be congratulated on these improvements, which came none too soon, Londoners have to thank the Chief Commissioner of the Metropolitan Police for the firm stand which was taken by Great Scotland Yard in refusing to license defective omnibuses. We are well aware that this severe discipline was not effected without hardships to many motor vehicle builders, but it was admitted by the representative of, perhaps, the largest firm of motor vehicle builders on Monday night, in the course of the discussion on Mr. Worby Beaumont's paper before the Society of Motor Omnibus Engineers, that the industry owed a great deal to Sir Edward Henry for the stand he had taken in the matter. Any other would have resulted in filling London's streets with an assortment of broken-down machines that would have worked irreparable injury.



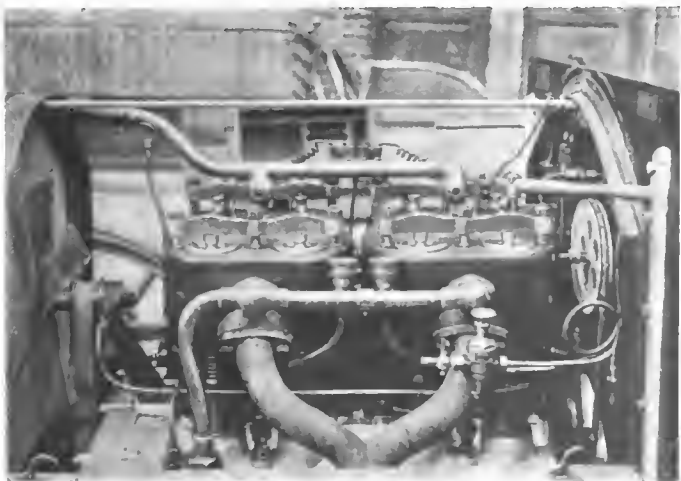
DETAILS OF THE INTAKE SIDE OF MARTINI ENGINE.

is provided by a lubricator on the Dubrulle system driven by belt from the exhaust camshaft, with special leads to main bearing, pump bearing and fan. A supplementary hand injector pump is fitted to the Dubrulle to provide for the motor being supplied with an extra quantity of oil on heavy gradients. There is also a separate compartment in the lubricator for kerosene with a hand pump to force same through the cylinders for cleaning purposes. An arrangement is provided to keep the oil at a proper consistency under varying conditions of temperature.

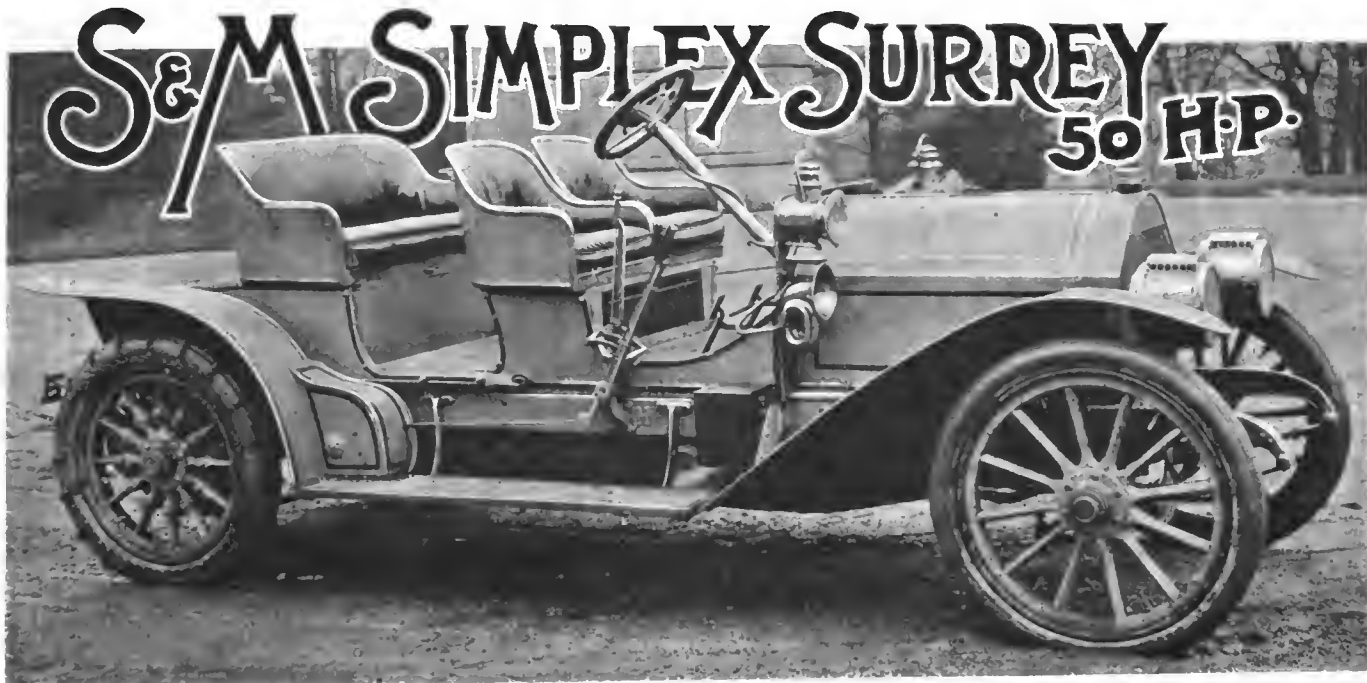
Control. Spark and throttle levers on the steering wheel give complete engine control; in addition the clutch pedal automatically throttles down the engine as the clutch is withdrawn. There are four foot pedals; decelerator, clutch, and two separate pedals for the independent brakes on the countershaft. On the dashboard are carried the pressure feed gasoline pump, lubricator, lever for shutting off gasoline supply to allow motor to aspire pure air, water-cooling control for brakes, and switch. The steering gear is of the irreversible type, considerably strengthened on the new model, with connecting bar behind the front axle.

A complete dust pan from the front of the engine to the rear of the gear box protects the motor and all menchanical parts from projections from the road. Inspection holes are provided in the pan at convenient positions. The muffler is carried transversely between the gear box and the gasoline tank, with exhaust pipes projecting at the rear at each side of the tank.

Body work is in all cases supplied independently and according to the taste of purchasers.



EXHAUST SIDE OF 50-HORSEPOWER MARTINI MOTOR.



As a summer touring car, or runabout, the new Smith & Mabley Simplex Surrey has much to commend it. This type has all the advantages of a two-seater runabout, and with its 40-horsepower engine is capable of a fast clip, without the disadvantage of very limited seating capacity which may be objected against the former. As will be seen from the illustration, the surrey model is of graceful appearance and has all the lines of a fast roadster for either two or four people.

Examining the mechanical features of the machine, we find much that is of interest, the construction throughout being of the highest quality and very best finish. A pressed steel frame of usual channel section narrowed in front to give convenient steering is mounted on 53-inch by 2½-inch and 36-inch by 2-inch semi-elliptic springs, having respectively 10 and 7 leaves. Wheel base is 124 inches and track 56 inches. Tires are 935 mm. by 135 mm. and 915 mm. by 105 mm.

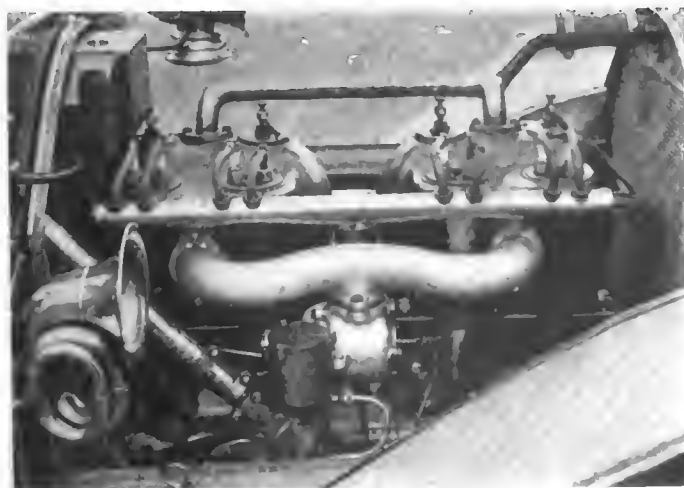
The four-cylinder engine, with cylinders cast in pairs, cylinder dimensions 5¼ inches bore by 5¼ inches stroke, is carried forward under the well-known S. & M. type of bonnet. Valves are on opposite sides and are all interchangeable. The engine is water cooled, circulation being assured by a gear-driven centrifugal pump, and the radiator being of the honeycomb type. A current of air is assured by a fan in the flywheel, the dimensions of which are 20 inches by 6 inches.

There is a double ignition system by Bosch high-tension magneto with automatic advance, and by storage battery and high-

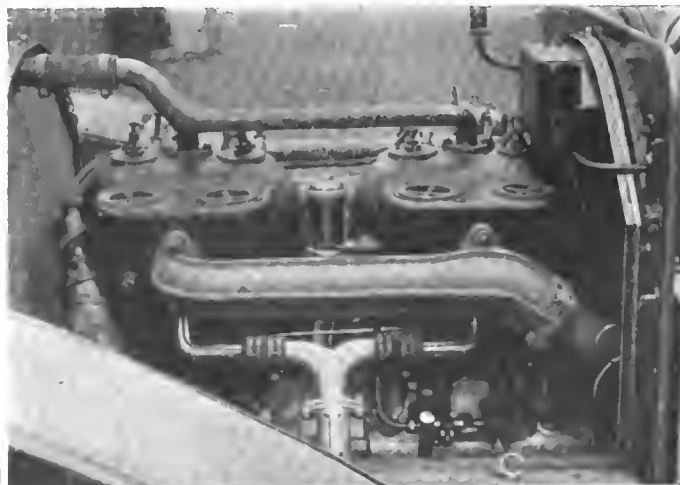
tension distributor. The two systems are quite distinct, being provided with two sets of plugs and two-way switches on dashboard. An automatic carbureter renders the motor exceedingly supple and makes possible a wide range of speeds. Mechanical lubricator is employed.

The clutch is of the multiple disc type, now so popular on high-grade machines, the advantage of which is that there is practically no wear and that the load can be taken up more progressively than with any other type. Two speeds and reverse are provided by sliding gear of the selective type, operated by one hand lever on the side of the car. All gears are of chrome nickel steel cut on special gear shapers to produce a perfect line of contact. Final drive is by side chains from sprockets on the counter shaft to the rear wheels. The number of teeth on the countershaft sprockets is 23, 25 or 27; those on the rear wheel sprockets are 44. Diamond chrome nickel steel chains are 1¼ by ½ by ¾ inches. Direct drive is obtained on the high gear. Ball bearings are employed throughout in the transmission.

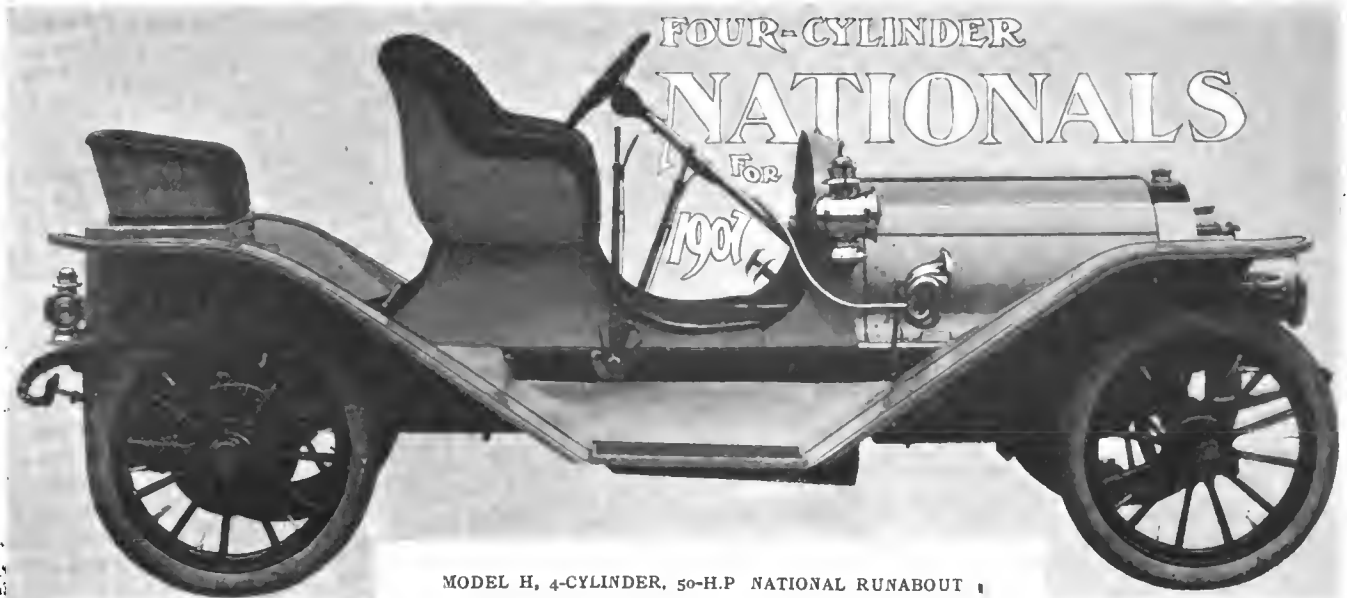
The braking system is very complete. On the rear wheels are two emergency brakes, 14 inches by 2 inches, of the internal expanding type, operated by lever on the side of car. Two pedal brakes on the differential, 11 inches by 3 inches, are operated by a foot pedal. The differential brakes are equalized and so arranged that in case one should get out of order the other can still be used. All brakes are absolutely protected from oil and are so constructed that no deformation can take place through heating.



INLET SIDE OF 50-HORSEPOWER SIMPLEX MOTOR.



EXHAUST SIDE OF SIMPLEX POWER PLANT.



MODEL H, 4-CYLINDER, 50-H.P NATIONAL RUNABOUT 1

THE motors used in Model H runabouts, touring cars and limousines of the National Motor Vehicle Company, are of the four-cycle four-cylinder type with separately cast, vertical, water-cooled cylinders 4.7-8 by 5 inches bore and stroke, developing 50 horsepower. The cylinders are mounted on an aluminum crankcase attached to a pressed steel sub-frame. Nickel steel admission and exhaust valves, all interchangeable, are mechanically operated by separate ball bearing camshafts, with valve levers adjustable to wear. The crankshaft is a steel bar hammered and bent into shape, revolving in five large imported D. W. F. annular ball bearings and has a ball thrust bearing at its forward end. The drop forged connecting rods are fitted with Parson's white bronze adjustable bearings, each bearing being held by four studs readily accessible through two large inspection ports on the side of the crankcase. There are four compression rings on each piston and exceptionally large hardened hollow wrist pins are employed. To dispense with keyways, the flywheel is bolted to a flange on the crankshaft.

Six and one-half gallons of water are carried in the water system and flat tube radiator, circulated by a gear-driven pump direct connected to the camshaft. A large ball bearing fan, mounted on the engine base behind the radiator, draws a powerful current of air through its entire area.

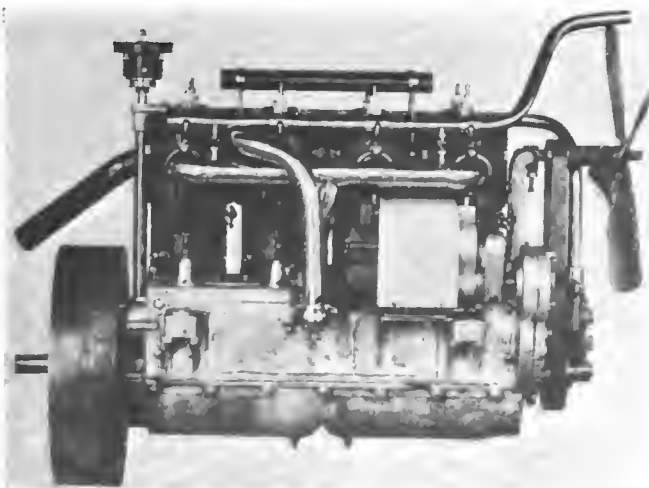
The aluminum leather-face cone clutch is fitted with eight flat springs placed under the leather in recesses cut in its face. These

permit the starting of the car gradually and eliminate sudden strain on the driving mechanism. Transmission is of the selective sliding gear type with three speeds forward and one reverse, giving direct drive on the high speed. Large annular non-adjustable ball bearings are employed on the main and counter shafts; the rear bearings on the main shaft are self-contained in a tubular cylinder and the whole enclosed in an oil-tight aluminum case.

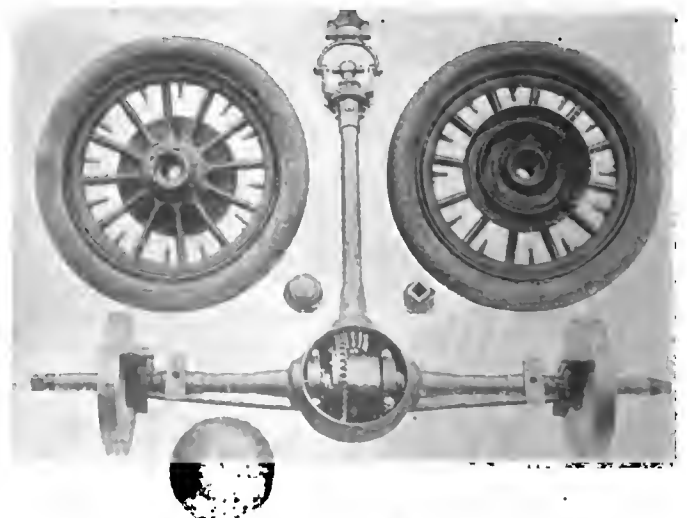
An enclosed, sliding universal joint connects the main transmission shaft and the driving shaft, transmitting power from the motor to the rear axle in nearly a horizontal line. The driving or propeller shaft is enclosed in an extra heavy seamless tube brazed into the spherical gearcase and revolves on two rows of large annular type ball bearings. An excellent feature of the National Model H is the provision made for examining the driving gear and differential.

There are four powerful internal expanding double-acting hub brakes engaging 11 and 15-inch drums cast integral with the hubs of the rear wheels. Two of these are operated by a hand lever and the two others are applied by means of a foot pedal.

Double ignition is employed, with separate sets of spark plugs, one consisting of a gear-driven magneto with its high-tension coil, the other of a storage battery with single vibratory coil and distributor. A third combination can be made by switching the battery current through the distributor of the magneto.



FOUR-CYLINDER, 50-HORSEPOWER NATIONAL MOTOR.



DETAIL OF THE REAR SYSTEM OF THE NATIONAL.

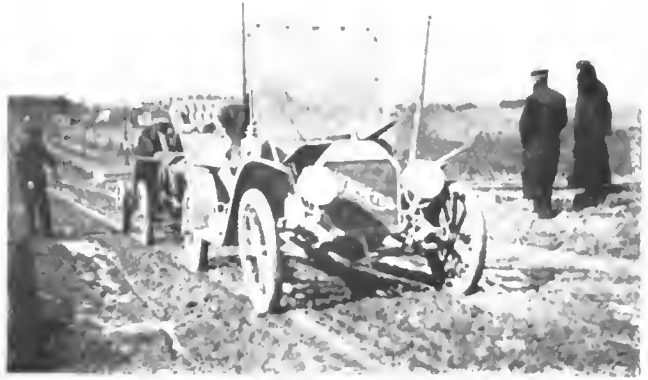
THE JOYS OF THE TESTING RUN.

By AN OCCASIONAL OFFENDER.

Ever experience the joys—and other sensations—of a mid-Winter or early Spring cross-country testing run? If not, you still have much to learn—and it is all practical—regarding autoing. Possibly you are a seasoned driver, on whom, through excessive indulgence, the sport has begun to pall. Perhaps the novelty of guiding a swiftly speeding car has not yet given way to that matter-of-fact state of mind that comes with the passing of time. You may even qualify in the amateur class. It matters little, for, whatever your standing as an automobilist, a century run through a rural district at this time of the year will bring you face to face with conditions hitherto unknown, and your fund of knowledge will be appreciably augmented.

The requirements are not many—at the outset. The standard formula, epitomized, would read something like this: One country road, one bright day, one testing car, one good mechanic (if you are an amateur it is well to dignify him with the title of driver, permitting him to officiate in that capacity), heavy overcoat, boots and other paraphernalia sufficient to protect you from the pranks of the weather man.

Care should be taken to select, if possible, a machine fresh from the testing room, sans fenders, mudguards and body, aside



LOOKING BACKWARD OVER THE FROZEN ROUTE.

motor as it settles down to the task of plowing a path through a sea of mud that is contagious. One instant you marvel at the strength displayed, and the next accept the accomplishment as a matter of course, looking forward with all the eagerness of a trained warrior to new fields of conquest. Hills that from a distance seemed to present an effective barrier become commonplace. You note the ease with which the car winds its way through ruts and wish they were deeper so you could test the full power of the machine, forgetting that it is doing more than could reasonably be expected.

In the distance appears a farmer, driving a spirited team. There is an exchange of signals, the machine is stopped and you pick your way carefully along the roadside, take a firm grip on the bridles and assist the anxious ruralite in guiding his fractious steeds by the new terror. Another dash down the highway, past farm houses where snarling dogs dash forth madly and vainly pursue you, barking wildly at the exhaust, dodging frightened poultry scurrying for safety, startling the bovines resting peacefully in the barnyard. There is the wave of a hand at the tiller of the soil who suddenly emerges from the cavernous depths of the barn—for your farmer, be it understood, is at all times a sociable mortal; a fleeting glimpse of faces pressed against the windows of the farm house, for the passing of an automobile, particularly in mid-winter, is still an event, and you are once more amid solitude.

A mile down the road the "honk honk" of your horn arouses from their slumbers the occupants of a covered buggy, jogging along contentedly behind the family steed. A frantic waving of arms gives the wholly unnecessary warning not to attempt to pass, for the single track would make such a move on your part



WHEN THE AUTOS COME TO TOWN BY TWOS.

from the none-too-secure seat upon which the driver and one other daring mortal may find a precarious resting place. The advantages of such a course become apparent before many miles have been traversed, if you are desirous of taking the seasoning treatment in allopathic doses. The acrobatic stunts performed in what at times bids fair to prove a vain endeavor to maintain your seat as you jolt along over the rough roads at a lively clip, the unobstructed sweep of the wintry wind, the stinging blows delivered the exposed portions of your face as in the teeth of a gale the machine splashes through water half way to the hub, burying you beneath a coating of mud until all resemblance to anything human has disappeared—these are some of the things that cause you to speculate on whether it is really worth while. You jolt about, discovering anatomical points of contact of whose existence you were hitherto unaware; the seat comes up to meet you in your downward plunge with startling regularity, you splutter and say unkind things as a sheet of muddy water envelops you—and then, almost unconsciously, you find yourself entering into the spirit of the occasion, and the earlier discomforts give way to a feeling of exhilaration and a sense of satisfaction at the way in which obstacles are overcome.

And there are compensations in plenty for any inconveniences encountered. It is worth many times the effort involved to observe the manner in which seemingly impassable stretches of road are left behind. There is a cheerfulness about the hum of the



A SLIGHT VARIATION FROM THE BEATEN PATH.

disastrous. Meanwhile Dobbin plods peacefully along, keeping in the middle of the course, while you throttle your motor, reduce speed and indulge in some pointed remarks regarding the outfit ahead. Ever and anon there comes a warning, and it is with a sigh of relief you see a cross road loom into view. At last the suspense is over. The faithful steed is turned aside, you open up the motor, preparing meantime to go to the assistance of the distressed female if necessary. A burst of speed, a pair of bulging eyes peer out from under the cover, old Dobbin leisurely turns his head and surveys you, not even deigning to prick up his ears, and you discover that the fright was all in the buggy instead of ahead of it.

Incidents multiply with astonishing rapidity. The stop at a country store for a supply of rope fillers masquerading under the name of Havanas, the halt for lunch at a wayside inn, where curious throngs surround the machine and give utterance to exclamations of wonderment and advance strange theories, putting the best of joke books into the same class as the patent office reports when it comes to provoking hilarity, all contribute to the full measure of enjoyment.

But it is only when, tired and stiff, creaking in every joint, plastered with mud until you are unrecognizable, possessed of a ravenous appetite, you alight from the machine, upon completing the trip, that there comes an appreciation of what the car has accomplished, and your previous estimation of automobiles is revised upward.

It is all in the game, this seasoning process. You may never be permitted to share its joys, its sorrows—for they are occasionally encountered. But unless it has been your good fortune to participate in one of these cross-country tryouts your autoing experience has not been fully rounded out, and marvel as you may at the satisfactory performance of your car, your knowledge of the stages through which it progressed before leaving the factory will be incomplete. You can only know it as it is, and though you may have some conception of the many processes involved in its make-up, the chief essential is lacking.

ST. LOUIS' FIRST SHOW PRECEDED BY PARADE.

St. Louis, April 8.—This city is entirely new to the business of holding automobile shows, and in order to call public attention to the first event of the kind which was held there last week it inaugurated the practise of preceding the show by an automobile parade somewhat after the manner of the circus. This was held under the auspices of the Automobile Club of St. Louis, and first, second and third prizes were awarded in each of three different classes—for machines having the best decorative scheme generally, the best floral decoration and the best comic decoration. The start was made shortly after noon on Monday last, and the route covered many of the most important streets of the city, disbanding at Forest Park.

The show opened a few hours later, and though it is the first effort of its kind in St. Louis both the city and the sponsors of the affair may well be proud of its success. The Jai-Alai Building offered about the only suitable housing for the affair, and its 20,000 square feet of floor space were taken advantage of to the best effect. Forty-four spaces were laid out on the main floor and were devoted entirely to complete cars. There was an overflow of cars in the annex, together with a liberal showing of motor cycles and motor boats. The balconies were turned over to the dealers and makers of accessories and parts, while that ubiquitous side-show—the moving picture exhibit—was also on deck. The main floor and annex mustered 29 exhibits of cars in all, with 14 accessory exhibitors, which, together with those of motorcycles and boats, brought the total up to 45. Contrary to long-established precedent, Monday was the opening day, although the show was in readiness and the doors could have been thrown open the Saturday night previous. The decorations were of an attractive order and well installed, the predominating motive being white, which was used as a floor covering, with flags and bunting to set it off, not to overlook the suspended balloon, for St. Louis wishes to assert her pre-eminence in the aeronautic field. The attendance was extremely satisfactory on the opening night.



INTERIOR OF THE HUGE JAI ALAI BUILDING, WHERE ST. LOUIS HELD ITS FIRST AUTO SHOW LAST WEEK.

THE SCIENTIFIC REGULATION OF TRAFFIC*

By EARL RUSSELL.

I AM fully aware that the scientific regulation of anything and the application of the principles of logic to legislation are naturally abhorrent to the mind of every Englishman. I am also fully aware that the recommendations and suggestions which I shall venture to make have no prospect whatever of being carried into operation in practice. Even so, I think it may be worth our while to consider for a short time what ideal regulations might fittingly be made to control the traffic of this country. The validity of one objection I fully admit, and that is that no paper schemes can carry any real weight until they have stood the test of experience. But some of the obvious faults of a scheme emanating from an individual may be removed by the full discussion and candid criticism which it will no doubt receive from many of the experts in this room. Let us then consider the ideal regulations that could be framed for traffic if we had the minute law-making and law-abiding character of the German coupled with the logical mind of the doctrinaire Frenchman.

Let me first then lay down certain postulates upon which to rear the logical superstructure. I do not wish to suggest that the postulates themselves might not be open to attack (in this age even Euclid is not sacred), but it is necessary to begin somewhere, and to take as our major premises some things on which we may be supposed to be agreed. I postulate therefore:—

1. That the primary object for which the money of the rate-payer is spent upon roads and streets is to provide channels for traffic.

2. That such traffic consists of vehicles of various classes, pedestrians and animals moving from one place to another place.

3. That it is an advantage to the community that such traffic should be conducted:

(a) With safety;

(b) With celerity;

(c) Without congestion or friction;

(d) With the minimum of expense or effort to the traffic itself, and with the minimum of burden to the rate-payers.

Next let us consider the classes into which this traffic may be divided for the purpose of this discussion, say, for example:—

A. Fast-moving traffic; including motor cars, motorcycles, bicycles, and gigs, hansom and broughams fitted with rubber tires.

B. Moderately fast traffic; including tradesmen's carts, light delivery vans, railway parcel vans, post office vans, and all classes of omnibuses—generally, in fact, all vehicles which habitually move at speeds between seven and twelve miles an hour.

C. Slow traffic; such as carters' carts, heavy vans, farm carts, traction engines, and the like.

D. Pedestrians; including dogs walking to heel or attached by a leash and led horses.

E. Animals; including cows, sheep, pigs, dogs not under control, donkeys, and all domestic poultry, and horses running loose.

It is obvious that the problem differs greatly in complexity and difficulty in town and in the country, and it would be convenient to take the country first. I do not think it can be said that the by-roads of the country are so full of traffic that any special regulations are necessary. All that is required is that fast vehicles should be driven with care, and that no persons should come round sharp corners on the wrong side in a reckless manner. Let us, then, exclude all by-roads in the country from our consideration, and confine our attention to main roads. The first observation to be made about the main roads in this country is that they would be much better for a little engineering. In their present form, with unnecessary hills, unnecessary corners, bad material for the road surface, carelessness in camber and super-elevation, they are a standing disgrace to a civilized and wealthy country, and they entirely fail to fulfil the conditions required by Postulate 3 (d). The ratepayers pay a larger sum than is necessary for the upkeep of a properly-made road, and the

users of the road have a more expensive and a more dangerous track than the configuration of the country requires. However, my purpose is rather to discuss the traffic itself than the roads upon which it runs; and the following are the regulations that I would suggest for traffic on main roads in the country:

1. Danger is caused by sharp corners; therefore, every such corner should be indicated by a sign, and every person or vehicle should keep to the proper side of the road at all times, and should not overtake another vehicle going the same way at corners. The corners themselves should be softened where possible, and hedges and other obstructions to the view should be removed.

2. Danger is caused by the unexpected emergencies of vehicles from a side road, and no vehicle should therefore be allowed to come from a side road on to a main road without coming to rest. Where two main roads cross, the speed should be reduced to ten miles an hour, or less in the case of horse-drawn vehicles.

3. The presence of animals not under control, or under imperfect control, upon the main roads is a danger, and no person should, therefore, be allowed to drive flocks of sheep or herds of cows upon a main road without the assistance of a second person at a distance to signal approaching vehicles and to assist in controlling the animals. Nor, as a general rule, should animals be allowed upon the main road at all between 9 A. M. and sunrise next day, except on the market day of the particular town. It would not, of course, be necessary to apply this prohibition to a single cow or single pig or single sheep, which was under adequate control by a rope or otherwise.

4. Pedestrians on main roads are dangerous both to themselves and to fast traffic, and where possible a raised footpath should be provided for their accommodation. In the absence of a footpath they should walk upon the side of the road facing the approaching traffic. Children playing or persons gossiping in the main road should be subject to heavy penalties for obstructing the traffic.

5. No person should be allowed to drive a vehicle on a main road without possessing a license, to be granted after examination in the regulations, and to be revocable for misconduct.

6. All vehicles traveling at night should be lighted both back and front.

By the adoption of regulations such as these fast motor cars could travel with safety to themselves and others on all the main roads of the country, and the average speed and comfort of all travelers upon the main roads could be sensibly increased, while I venture to say that the number of fatal accidents and personal injuries due to vehicles, whether motor or horse-drawn, would be decreased by something like three-fourths.

The alternative suggestion of motor tracks throughout the country has its fascinations both for motorists and their assailants. But with the precautions I suggest, it would be possible with safety on main roads of good surface to maintain an average speed ample for all requirements. Moreover, it is not good economics to incur expenditure—no matter who finds the money—which can be avoided by making a proper use of the plant you already have. From the tourist point of view a straight motor way, with no obstructions, would be very tedious, and only of real use to powerful cars going long distances in a hurry, or to passenger cars. For every thousand pounds per mile spent on the construction of the road, sixty-six cars per day, all the year round, at a toll of a penny per mile, would be required to pay interest and depreciation, not considering working expenses.

We now come to the much more difficult question of regulation in towns, and as we are all familiar with London, it will, perhaps, be convenient to take it as an example. The trouble from which traffic suffers in London is chiefly that of congestion, and this congestion is due to various causes. Sometimes, but comparatively rarely, it is due to the fact that a larger number of vehicles wish to proceed along the street in one direction than the street is physically able to accommodate. More often it is due to a string of vehicles being held back by some slow-moving vehicle in front, and being unable to pull out and overtake it on account either of the presence of central standards, or of a

*Paper read before the Royal Automobile Club of Great Britain and Ireland.

vehicle coming in the opposite direction. The dangers in London do not seem great, on account of the slow average speed of the traffic, except at night, when the streets are comparatively empty, and hansoms and other fast vehicles may often be seen dashing round right-angled corners on the wrong side. In spite, however, of the comparatively slow speed, there are very many numerous accidents, indeed, in London. The cost of the delay to traffic has often been roughly estimated by writers, but none put it at less than several million pounds in the course of each year. The making of new streets or the widening of existing streets is an enormously expensive process in any large town, and any scheme which doubles or trebles the existing capacity of the streets without any cost to the ratepayers *ought*, therefore, to receive enthusiastic support. What, then, is the remedy? In the first place, if the greater part of the confusion is caused by the mingling of traffic of all sizes and all speeds, let the traffic be separated into three classes, A, B, C. In the second place, let every wanton obstruction of the street space in the shape of refuges and cab ranks in the middle of the street be swept away, and, as a consequence of this, it will be necessary for the safety of the traffic itself to provide that it shall flow only in one direction, and for the safety of pedestrians it will be necessary to provide either bridges or tunnels. If traffic in any given street is to be only in one direction, it follows that some parallel route must be found to accommodate the traffic in the reverse direction. The danger from corners can be almost entirely abolished by causing all corners to be taken on the near side, and where this is not possible an inlaid white line should be put in the street surface which would have the effect of preventing a vehicle from cutting the corner. Imagine the pleasure of having no refuges and no traffic in the opposite direction to look out for, no danger in pulling to the off side to overtake another vehicle, no difficulty in keeping to the curb because of the vehicle already standing there. Picture also the diminution in accidents owing to nearly all corners being turned on the natural side, and the few exceptions being turned in such a manner as to make a collision almost impossible. Of course, a necessary incident of such a system would be that every driver should be licensed, and should pass an examination in the regulations applicable to London traffic. Having disarmed my critics by insisting so frequently upon the Utopian character of these proposals, I append for my own satisfaction a draft bill showing how easy it would be to give legislative effect to them, should the community ever decide to conduct its traffic on business principles.

AN ACT FOR THE REGULATION OF TRAFFIC IN THE UNITED KINGDOM.

PART I.—COUNTRY.

1. A person in charge of a vehicle upon a main road shall keep upon the left or near side of such main road and shall not at any time permit the off side of his vehicle to project more than two feet beyond an imaginary line drawn along the center of such main road except for the purpose of overtaking another vehicle going in the same direction.

Provided that he shall not overtake or attempt to overtake any other vehicle going in the same direction within fifty yards of any corner on such road which would prevent traffic approaching in the other direction from having a clear view.

2. Any person in charge of a vehicle on a main road who is overtaken as provided in the last section shall keep his left or near wheel within not less than one foot of the edge of the metaled portion of the road.

3. No person in charge of a vehicle shall come upon a main road from any other road without bringing his vehicle to rest at the junction with the main road.

4. No person shall suffer any animal which is not under the control of some person to be or remain upon any main road between the hours of 9 A. M. and sunrise on the next day.

Provided that this section shall not apply on market day within ten miles of a market town to animals being driven to or from market under the charge of some person with the assistance of a second person to warn approaching vehicles.

5. No person in charge of a vehicle on a main road shall cross another main road without reducing speed and taking such other precautions as may be necessary.

6. No person on foot shall walk upon the metaled portion of a

main road at a greater distance than three feet from the right hand edge of the metaled portion. No person on foot shall be permitted to loiter or play games upon the metaled surface of any main road.

7. (1) A person shall not drive or conduct a vehicle on a main road unless he is licensed for the purpose under this section and a person shall not employ any person who is not so licensed to drive or conduct a vehicle.

(2) The provisions of Section 3 (2) (3) and (4) and of Section 4 of the Motor Car Act 1903 shall apply to the granting, endorsing and suspending of licenses and the disqualification of license holders so far as applicable as if the word vehicle were substituted for the word motor car.

(3) The authority granting the license shall examine the applicant in such way as they may think fit and may for this purpose appoint any person or committee as examiner or examiners and pay such fees as they may fix, not exceeding 5s. per candidate.

PART II.—TOWNS.

8. In boroughs exceeding in population 250,000 the Local Government Board may, on the application of the Town Council, declare the whole or a limited portion of the borough or certain specified streets in the borough to be a special area.

9. (1) In such special areas it shall be lawful for the Town Council to make such regulations for traffic to apply during the whole or any specified portion of the day providing inter alia:—

(a) For defining or limiting the classes of traffic to be allowed along particular streets;

(b) For traffic to be limited to flow in one direction only;

(c) For prohibiting the loading or unloading or stopping of vehicles in the street;

(d) For regulating the routes and stopping places of omnibuses and for providing standings for other public service vehicles.

(e) For marking the centers of streets and the angle at which corners may be turned by vehicles where necessary;

(f) For any detailed regulations ancillary to the above.

(2) Any regulations made under this section may be altered, amended or added to at any time.

(3) Regulations made under this section shall not come into force until one month's public notice has been given by posting in the streets to be affected and by publication in the newspapers circulating in the district.

(4) Regulations for driving traffic into five classes to be known as fast traffic, moderately fast traffic, slow traffic, pedestrians, and animals, shall be made by the Local Government Board. Any dispute or difference as to the class of traffic to which any particular kind of vehicle or animal belongs shall be settled by the Local Government Board, whose order shall be final.

(5) A copy of all regulations in force shall be given to every person who receives a license under Section 10.

10. A separate license, to be granted and obtained in the same manner and subject to the same provisions as enacted by Section 7, shall be necessary for any person in charge of a vehicle in a special area, and no person shall be entitled to drive or conduct a vehicle in a special area by virtue of a license granted under Section 7, but a license under this section shall be valid for any special area.

SPECIAL PROVISIONS APPLICABLE TO LONDON.

11. The area contained within a radius of four miles from Charing Cross shall be deemed to be a special area within the meaning of Section 8, and shall be called the Metropolitan Special Area.

12. The powers exercisable by a Town Council under Section 9 shall be exercised within the Metropolitan Special Area by the Commissioner of Police for the metropolis, with the advice and consent of the London County Council.

PART III.—GENERAL PROVISIONS.

13. No person shall be entitled to recover damages for loss or injury to any vehicle or animal if at the time of the happening of such loss or injury the vehicle or animal was suffered by the owner or person in charge to contravene any of the provisions of this act, or of any regulations made under this act. In any civil action proof of such contravention shall be sufficient to establish liability without further proof of negligence, and shall entitle any person who has suffered loss or injury owing to a contravention in respect of any vehicle or animal to recover damages as if negligence had been proved.

14. Any person failing to observe any of the provisions of this act or any regulation made under this act shall be guilty of an offense under this act, and shall be liable on summary conviction in respect to such offense to a fine not exceeding £50, or in the discretion of the court, to imprisonment not exceeding three months.

15. It shall be lawful for any local authority to incur expenditure in advertising or posting the provisions of this act or of any regulations made under this act.

16. (1) In this act the expression "vehicle" shall mean anything running on wheels other than perambulators and wheel-barrows.

(2) This act may be cited as the Traffic Regulation Act, 1907.

HELPFUL HINTS FOR THOSE TOURING ABROAD

By W. F. BRADLEY.

If a tour through Europe involved no more formalities than a run to Chicago, automobilists would not hesitate long before deciding to cross the Atlantic. But the prospect of a voyage to France, Italy, Germany, and other countries of the Old World brings visions of customs officials, registration laws, duties, any of which slighted may entrain undesirable acquaintance with the merciless gendarme. In reality touring through the old country is no more difficult for an American than for a native, if only advantage is taken of the facilities offered by the various European associations and clubs for those who travel by automobile.

Nine-tenths of the Americans who make an automobile tour through Europe start from France. Some account, then, of how French associations aid automobilists will be of use to the greatest number. The Touring Club of France, the largest organization of its kind in the world, renders invaluable aid to the foreign visitor. By an understanding between the American Automobile Association and the T. C. F., any member of the former can become a member of the French body on simple request in writing and a payment of the annual fee of one dollar. One of the most valuable services the T. C. F. can offer is the entry of the machine into nearly all European countries without any formalities at the customs house.

To Obtain the Greatest T. C. F. Convenience.

Thus a member before leaving New York could arrange for his automobile to pass into almost every country in Europe merely on presentation of a paper known as a tryptique. To obtain this, particulars of the car must be furnished and the amount of custom duty levied by the countries about to be visited deposited with the club, which amount will be refunded by the club at the end of the tour. If the traveler knows what his plans are a couple of months in advance, he can arrange all this before leaving home and pass from one European country to another more easily than here from one State to another.

At the club's headquarters in the Avenue de la Grande Armée, Paris, maps and guide books dealing with every quarter of Europe in which the tourist has, or ought to wander, can be consulted and purchased. In addition there are always secretaries present to give advice on routes and aid in mapping out tours. There are quite a number of general advantages which the T. C. F. bestows on all who have the traveling habit, whether they pay their annual dollar or not, such as sign posts, improved roads, improved hotels, and generally improved conduct on the part of those who own the hotels.

Benefits Obtainable from the A. G. A.

If the automobilist intends starting his tour from Paris, and a very large number do, notwithstanding the evil reputation which the roads in the neighborhood of the capital have earned (which reputation, by the bye, is most frequently due to the mistakes of strangers in picking out old paved roads instead of the more indirect macadamized surfaces) he can obtain considerable benefit from membership in the Association Générale Automobile. This body is an offshoot of the Automobile Club of France, and has its offices in the same building.

One of the first and one of the most important matters on arriving in France is to obtain a driving license. Ordinarily this will involve a delay of two or three days, according to the idea the official has of the value of time or his inclination to work. The A. G. A. is empowered by the national authorities to hold examinations and grant temporary operating licenses, which can be exchanged at leisure for the official document. A stranger arriving would present himself at the Association headquarters with his car, a few unmounted photographs of himself, and the

necessary documents to prove his identity. Immediately an examiner takes him in hand, and, if satisfied with his ability to handle an automobile, grants him a certificate which will be accepted by any sergent de ville or gendarme in France, or almost every other country of Europe for that matter. When the clerks in the Mining Department have gone through their leisurely routine the official papers will be forwarded to you, probably three weeks later, but so long as you have the A. G. A. license in your breast pocket you can look any man—or gendarme—in the face. The A. G. A. is also empowered to issue the tryptique to its members, as is done by the Touring Club of France.

How the A. G. A. Recommends and Supplies Chauffeurs.

Many an American has engaged a chauffeur in Paris—and regretted it. There are a special class of polyglots hanging around the garages of the gay city who find it easier to get an operating certificate than a good character recommendation. American millionaires are their best friends. If a member of the Association Générale Automobile, you can obtain a chauffeur whose ability has been proved and whose moral character is vouched for by that body. The A. G. A. keeps close watch over the men it recommends, causes them to report to headquarters whenever out of employment, and withdraws their diploma on any proved case of misdemeanor.

Further advantages of the association are information on tours, maps, etc., a discount on tires, spare parts, and automobile assurance, by arrangement with a number of firms. The annual subscription of the association is \$4, reduced to \$2 for members of the Automobile Club of France or affiliated bodies. In a conversation with the secretary of the association last year the writer was informed that any member of an American Automobile Association club would be accepted as a member of the A. G. A. on simple payment of fees.

Not Much Obtainable from A. C. F.

That august body, the Automobile Club of France, housed in a former abode of royalty, has less to offer the simple tourist than some of the more humble clubs. Its Touring Commission, however, has done and is doing useful work in the collection of information on tours, roads, foreign regulations, and custom duties. It is generally more concerned with improvements in general, improvements which benefit the mass of tourists, than in giving help to individuals. Recently, under the secretaryship of E. Andrieu, the work of the Touring Commission has been considerably extended and the publication of a weekly official journal on automobile matters has been undertaken.

The Motor Club of Belgium offers in its territory almost all the advantages given by the Touring Club of France. An understanding between the Belgium body and the A. A. A. gives reciprocal benefits between these two organizations.

NO CAUSE FOR ACTION, OWNER NOT IN CAR.

SEATTLE, WASH., April 8.—Owners of automobiles are not responsible for all acts of their chauffeurs, according to a decision handed down by Judge Griffin in the King County Superior Court. Suit was brought against James D. Hoge to recover \$8,200. During the progress of the trial it was shown that the driver was out for his own pleasure when the plaintiff was struck by the machine. Judge Griffin immediately took the case out of the hands of the jury and ordered dismissal of the action. Seattle automobile owners have had considerable trouble because of acts of their drivers. Contrary to orders they have taken surreptitious trips with friends. Carelessness often prevails during such trips. Owners here are now putting a stop to this.



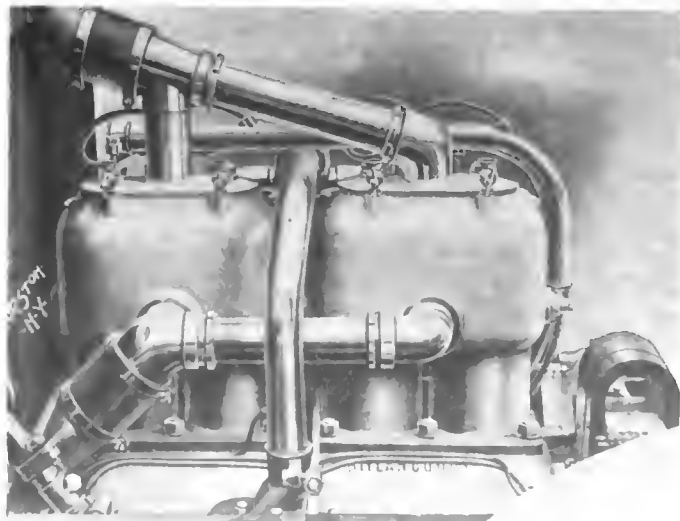
LE GAULOIS TIRE WAGON ON ITS DAILY ROUND.

TIRE FIRM PREFERS MOTOR VEHICLE.

As illustrative of how tires are delivered and repairs collected in Paris, the accompanying illustration will be noted with interest. The tires are Le Gaulois, manufactured by Bergougnan & Co., a firm which has made enormous progress in recent years, and now has a large establishment close to the Avenue de la Grande-Armée. The truck is a Lacoste & Batemann fitted with Bergougnan solid tires. The headlights are of American manufacture.

ACCESSIBILITY IS A RENAULT FEATURE.

One of the most admired engines at the last Paris automobile Salon was the new four-cylinder Renault, an illustration of which is given herewith. A feature which must be apparent even to those little acquainted with the detail of engine construction is the accessibility and neat arrangement of the Renault motor. With the radiator carried behind the engine against the dashboard the maximum of accessibility is obtained, and water circulation piping considerably simplified; this principle first adopted by Renault three years ago is now being followed by several prominent French builders. Valves are all on one side, and are mechanically operated. The magneto is carried in front of the motor and is driven by gears off the camshaft, all of which are completely enclosed in the crankcase. It will be noticed also that the carbureter is carried on the right-hand side of the engine with induction pipe leading up between the two sets of cylinders and passing to the opposite side, where the inlet ports are centrally located between the exhaust ports. Engine control is entirely by throttle.



A MUCH ADMIRER CLEAN-CUT FRENCH MOTOR.

HOW ONE CONCERN HAS UTILIZED AUTOS.

Boston, April 8.—Starting in 1902 with four steam runabouts, the Moxie Nerve Food Company now has a score of cars, mostly gasoline, for the use of its salesmen, and also employs several big trucks for freighting purposes and a number of cars for new cross country advertising and inspection trips. More cars will be added this year, and one of the Moxie autos will do some valuable work in placing road signs over many of the country roads of New England. These signs will be distributed by special men, who will cover the territory in a 40-horsepower Matheson with a light delivery body.

As to where the automobile service saves, F. E. Thompson, the man whose far-sighted enthusiasm for the automobile is principally responsible for the Moxie Company's successful experiments, said to THE AUTOMOBILE correspondent the other day: "The cost of using the autos amounts in a year to about what it would cost to keep the same number of horse-rigs in our territory. But the autos cover the ground twice where the horses would get over it once. Our salesmen formerly kept closer to the railroads than now, and after they began using the autos they reached a good many small villages and cross-roads stores that had never done much business with us before. In the heavy business the trucks do work which horses could not be expected to attempt, because they make such long runs.



LAST YEAR'S MOXIE PARADE THAT STARTLED NEW ENGLAND.

But the Boston truck, which makes runs of reasonable city length, does the work of two two-horse vans."

Mr. Thompson himself knows how to get a good deal of enjoyment, as well as profit, out of automobiles. He has Stanley, Knox, Locomobile, Rambler and Matheson cars for his own use, and has made numerous tours. Counting business and pleasure, he has covered probably 50,000 miles by automobile since he became addicted to that kind of locomotion. Last winter he shipped his car to Florida, toured around Jacksonville for a time, then reshipped to Ormond and had his car on the beach at racing time. His experience has made him a good judge of the road building in various sections of the country. He says Massachusetts has by all odds the best system of highways; New Jersey is next, and Connecticut he places third. Southern roads, as a rule, he denominates bad, on account of lack of care and surplus of red clay. The roads between Schenectady and Rochester, in New York, come in for some pretty earnest condemnation from Mr. Thompson's lips. He thinks a big State like New York ought to do better.

TRACTION BLOCKS MOTOR 'BUS FRANCHISE.

PHILADELPHIA, PA., April 8.—The city of "brotherly love" wants the motor 'bus and the Auto Traction Company has been organized to fill the want. As yet it lacks a franchise and a bill granting it is now pending before the city council—at least it was until the last meeting of that august body, when it was finally referred back to the Highways Committee. It is thought that the blocking of the bill is a practical acknowledgment on the part of the local transit company that the motor 'bus is not looked upon with favor in that quarter.

SPRINGTIME ACTIVITIES WITH THE CLUBS

Worcester Club to Re-elect President Coughlin.

WORCESTER, MASS., April 8.—The annual nomination of officers for the ensuing year have been made by the Worcester Automobile Club. The nominations, which will go through unopposed next month, are: President, John P. Coughlin; vice-president, Daniel F. Gay; treasurer, William N. Stark; secretary, Frederick E. Frost. President Coughlin and Mr. Gay were appointed to secure a man to be known as assistant secretary, who will make his headquarters at the club and in reality be secretary. Mr. Frost finds that he cannot devote to the constantly increasing membership of the club and to his business the attention that each deserves, so Robert M. Pratt, a newspaper man, will become assistant secretary. He is well known in auto circles.

Worcester's automobile club is representative in every sense of the word. The club has roomy and comfortable quarters in the heart of the city, and a constantly increasing membership that now totals over 400. The policy of the club has been changed from a distinctly garage club so that now its activities include numerous social features, when the wives and daughters of members are admitted to the privileges of the club. It is affiliated with the Massachusetts State Association of the A. A. A.

The disposition of the club to make a campaign as a whole of educating the residents of the rural districts to the automobile all brought members into the fold, and with an increased membership it was possible to secure the entire top floor of the Chase building. The club this summer will have a roof garden.

The Worcester Automobile Club was organized February 16, 1901, when less than a dozen automobilists gathered at the agency for the Locomobile here and perfected an organization. J. W. Bigelow was president; B. A. Robinson, treasurer, and H. E. Shiland, secretary. From this time on the meetings of the club were of the happy-go-lucky sort, there being but little interest in the club manifested. In September of the following year the club held an annual meeting. George B. Cutting was then elected president; Dr. R. M. Gardfied, vice-president; H. E. Shiland, treasurer, and John S. Harrington, secretary.

The club then voted that its annual meeting should be held thereafter in May, and on the third of that month, the following year, Asa Goddard was elected president. From his election the club began to wake up. It was Mr. Goddard who thought and planned the hill climb of 1905. Unaided, practically, he managed the climb on Dead Horse Hill, overcoming the opposition of the civic authorities of Worcester, and, what was harder, the authorities in Leicester, who have jurisdiction over the greater part of the hill course. Before the first hill climb, Mr. Goddard managed and carried out successfully the Memorial Day meet of Greendale track.

Until November, 1904, the club held its meetings at any convenient office or clubroom, but during the month Mr. Goddard made arrangements to have the club headquarters at the Bay State Hotel. It may not be amiss to relate a story told among the members, which shows just how Mr. Goddard made arrangements that turned out for the best interests of the club. He arranged with the hotel management for the club to pay a certain reduced price, it is said, for its quarters. Anticipating the business that would fall to the hotel from visiting automobilists and club members, Mr. Goddard arranged that the club was to receive a certain percentage on all sales made in its rooms. It's easy to guess the result. In a very short time the club was not only getting its headquarters rent free, but the hotel management was owing the club money at the end of the month. The story may be a little overdrawn by continued repetition among automobilists, but in the main it is true.

Besides the hill climb, which is now an annual affair, the club holds an Orphans' parade annually, as well as a gymkhana at the Grafton club.

Ontario Motor League Formed by Canadians.

TORONTO, ONT., April 8.—At the annual meeting of the Toronto Automobile Club a very important step was taken in the formation of what will be known as the Ontario Motor League. With the organization of this body the corporate existence of the Toronto Automobile Club ceases, the club being taken over by the Ontario Motor League, in which all motorists in the province of Ontario are eligible for membership, and with which other local clubs will be affiliated.

The following officers were elected: President, Noel Marshall; vice-president, T. A. Russell; secretary-treasurer, E. M. Wilcox; directors, William Doble, R. J. Christie, M. C. Ellis, G. H. Gooderham, A. E. Chatterson, Dr. P. E. Doolittle, F. F. Miller, W. W. Doran and Lloyd Harris.

The principal object of the league is to promote a good roads movement throughout the province. Very tangible progress has already been made by the Toronto Automobile Club in offering a number of prizes aggregating \$1,000 for the best improved mile of roadway within a certain period to the various municipalities in the County of York. The roads in this country are greatly in need of improvement. The county has been backward in the past in spending money on them. Ten entries have been made and very considerable interest is being taken in the competition by the competing municipalities. The Ontario Motor League has taken over the work in connection with this competition and is taking steps to co-operate with other bodies in spreading the good roads movement throughout the province.

The following committees have been elected:

Good Roads: William Doble, chairman; F. F. Miller, E. J. Christie, Lloyd Harris, T. A. Russell, J. C. Eaton.

Membership: G. H. Gooderham, chairman; F. E. Mutton, W. W. Doran, A. E. Chatterson.

Legislation: M. C. Mills, chairman; T. A. Russell, G. H. Gooderham, Dr. P. E. Doolittle.

Publication: A. E. Chatterson, chairman; R. J. Christie, F. F. Miller, M. C. Ellis.

Rejuvenation of the Grand Rapids Club.

GRAND RAPIDS, MICH., April 8.—The Grand Rapids Automobile Club, at its recent meeting, elected thirteen new members, making the membership of the club now eighty-four. Considerable enthusiasm was aroused over club matters, especially a new clubhouse, and it looks as if the club, which has laid dormant for some time, intended to do something this summer. It is definitely settled that a clubhouse will be bought at Cascade, a delightful country place eight miles from the city, just a nice run for a dinner party on hot summer evenings.

Another matter which has been practically settled is the formation of a State Automobile Association for Michigan. The local club is in favor of it, and has appointed a committee to confer with the Detroit club at their next meeting, April 16. It is necessary, in order to have the association formed, for only three clubs to get together. If Detroit is not in favor of the proposition, it is believed that it will be an easy matter to get two other clubs, such as those at Muskegon and Kalamazoo, to join with the local club. So the association is practically assured.

J. R. Jackson, a Grand Rapids man, has just recently been appointed a member of the A. A. A. Touring Board.

Quaker City Club to Aid Members Unjustly Arrested.

PHILADELPHIA, April 8.—G. Douglas Bartlett, chairman of the law committee of the Quaker City Motor Club, has announced that his committee will defend, free of charge, all members of the club who think they have been unjustly dealt with by the police authorities of Philadelphia and adjoining counties in the matter of arrests and fines for alleged overspeeding or in mix-ups

over the tag question. This action was taken in view of the fact that many members, rather than suffer delays and incur additional expense for counsel fees, have been in the habit of meekly "ponying up" to the authorities, although convinced that they have been imposed upon. The ease with which some motorists "cough up," Mr. Bartlett claims, has a tendency to make the Vidocqs of the countryside all the more eager for easy money, with the result that what was at one time only an occasional nuisance is likely to develop into a constant menace to automobilists in general if something is not done to immediately check it. The bare announcement that such unjust arrests and finings will be fought to a finish will doubtless have the effect of making the village Sherlock Holmeses more circumspect.

Indiana Clubs Are Awakening.

INDIANAPOLIS, IND., April 8.—There are indications that a number of automobile clubs that were dormant last year will be rejuvenated this season. For some reason there was practically no interest in clubs through Indiana last year. On Saturday night a meeting was held at which plans were discussed for reviving the Indiana Automobile Club. At one time this was a prosperous organization with about 300 members. Later in the season an election of officers will be held. The president elected last year has not been located, as few of the members can recall who he was.

The Indiana Motor Club, which started an elaborate clubhouse at Broad Ripple last season, will endeavor to complete it this spring. Interest in the club will also be revived. Owners of Indianapolis and Terre Haute are planning to build a clubhouse midway between the two cities.

The interest in clubs at the present time is due largely to the fact that it is believed the A. A. A. tour will include Indianapolis in its schedule. An Indiana State body of the national organization seems to be assured.

Aero Club Entertains Wellman and Hersey.

NEW YORK, April 8.—Walter Wellman, the explorer who is planning to reach the North Pole with an airship, arrived in this country last week for a short visit. Wednesday night he was a guest of the Aero Club of America at its clubrooms, No. 12 East Forty-second street, and a fellow guest was Major Hersey, who with Frank Lahm won the Gordon Bennett balloon trophy for America. Mr. Wellman gave an extensive talk of a most sanguine sort in relation to his hope of traveling to the North Pole in his gigantic airship now being constructed in Paris. Major Hersey sailed Thursday morning last, in company with Dr. Fowler, another member of the expedition, and Mr. Wellman expects to return on the French line boat leaving this week. The party will leave Paris for Spitzbergen early in May, and the actual start for the Pole will be in the latter part of June.

Long Island A. C. Selects Route Across Brooklyn.

BROOKLYN, N. Y., April 8.—The Long Island Automobile Club has selected a direct route for automobilists driving from Brooklyn Bridge to Prospect Park. The telephone and telegraph companies have given permission for the use of their poles, and the signboards, two feet long by one foot wide, are now being placed by the Runs and Tours Committee, of which Alex Schwalbach is the chairman. The route from the Brooklyn Bridge plaza is up Liberty street, across Fulton, passing under the elevated railroad into Clinton street, then to Pacific street, turning left into Fourth avenue, and then left into Degraw street, which leads up to the Prospect Park Plaza.

Annual Dinner of the Peorians of Illinois.

PEORIA, ILL., April 8.—The Peoria Automobile Club gave its third annual dinner at the National Hotel. Sidney S. Gorham,

president of the Illinois State Automobile Association, was present and spoke on the new State automobile bill now before the Legislature. The dinner was well attended and prospects are good for club activity in Central Illinois during the coming season. The present officers of the club are: President, B. H. Onken; vice-president, A. E. Augerson; secretary, R. A. Whitney; treasurer, W. H. Rees; directors, J. B. Bartholomew, M. E. Ma-gruder, S. K. Hatfield, L. C. Wheeler.

Marylanders Will Have Tour to Jamestown Exposition.

BALTIMORE, April 8.—The Automobile Club of Maryland is planning a tour to the Jamestown Exposition this summer. While the plans for the run have not as yet been thoroughly completed, the prospects are that at the next meeting of the club the date for the tour will be determined and the final arrangements made. Howard W. Gill was in Norfolk and Richmond last week looking over the ground that will have to be covered. He reports that from Stanton to Baltimore there is excellent prospects for a comfortable run, but from Stanton on the roads would stagger a mule.

Entries Will be Plentiful for the New Jersey Run.

NEWARK, N. J., April 8.—Secretary Bonnell, of the New Jersey Automobile and Motor Club, is receiving numerous entries for the three-day endurance run, May 30-June 1. Morristown, German Valley, Washington, Somerville and Newark have been selected as controls for the first day. Thirty-three new members were elected at the last club meeting.

NEW CLUBS ADDED TO THE ROSTER.

Peoria, Ill.—The Pup-St. Louis Auto Club has been formed in this city with the following board of officers: President, Richard Lawrence; vice-president, J. R. Jobst; secretary, Charles Kolmenstetter; treasurer, R. M. Dunham.

Iowa Falls, Ia.—One of the first automobile clubs in this part of the State has been formed by automobilists residing in Wright county. J. Fitzmaurice, of Eagle Grove, is president and Eugene Schaffer fills the office of secretary.

Logansport, Ind.—An automobile club has been formed here to arrange for the reception of the Glidden tourists who will pass through the city shortly after the A. A. A. tour departs east from Chicago. The name of the new organization is the Logansport Automobile Club.

Atlanta, Ga.—The Automobile Country Club, with a membership limited to 100, is the latest addition to this city's representative organizations. Pending permanent organization, Edward H. Inman has been elected temporary president and Charles I. Ryan, secretary-treasurer.

St. Joseph, Mo.—Permanent organization of the St. Joseph Automobile Club has been effected with the following officers: President, Huston Wyeth; vice-president, Charles A. Kelly; secretary, Harry D. Todd; treasurer, E. A. Zimmerman. A miniature automobile wheel, in grass, has been adopted as the club emblem.

St. Louis, Mo.—The St. Louis County Automobile Club has been incorporated. Edward E. Doss, Ellisville, president; Peter Gluck, Gumbo, vice-president, and James Staebell, Manchester, secretary-treasurer. The club, which is composed of autoists in St. Louis county outside the city proper, will make a strong effort for improvement of the suburban roads.

Greenville, S. C.—A club is in process of formation here which will include all automobilists in the county. At the preliminary meeting Perry Beattie presided, and a committee was appointed to draw up a constitution and by-laws. Another committee was selected to nominate permanent officers for the permanent organization, which will be effected within the next ten days.



WAGNER READY FOR SICILY'S MOUNTAIN ROADS.

RADIA, ANOTHER CANDIDATE FOR THE TARGA FLORIO.

AUSTRIAN CLUB TO HOLD INTERNATIONAL RUN.

May 24, 25 and 26 the Austrian Automobile Club will hold an international contest for light touring cars over a circuit of 715 kilometers, starting and finishing at Vienna and passing through Leoben, Klagenfurt and Graz. Only stock cars using internal combustion motors will be eligible. They will be divided into three classes, as follows:

Class 1. Single-cylinder motors having a cylinder capacity not to exceed 1.5 liters.

Class 2. Two-cylinder motors having a cylinder capacity not to exceed 2.5 liters.

Class 3. Four-cylinder motors having an aggregate cylinder capacity not to exceed 2.6 liters.

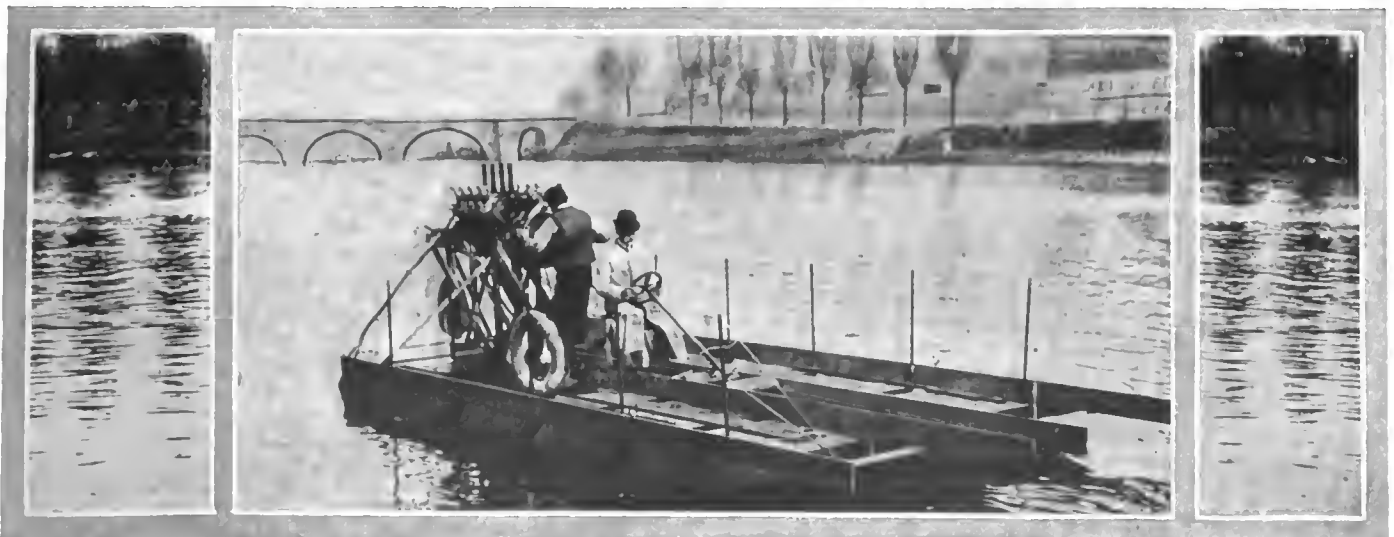
Cars having two-cylinder motors with an aggregate cylinder capacity not to exceed 1.5 liters will be included in Class 1. All cars must carry regular equipment, be provided with two or more comfortable seats, mudguards, muffler, two brakes, three lamps and a regular touring body. Single-cylinder cars must carry two, twin-cylinder cars three, and four-cylinder cars four passengers or their equivalent in ballast. The run is to extend over three days and on each the "durchschnittsgeschwindigkeit," or mean speed, must be not less than 25 kilometers per hour for single-cylinder cars, 28 for two-cylinder cars, and 30 kilometers per hour for four-cylinder cars. A speed above 40 kilometers per hour is prohibited. The prizes will be awarded on a point system, figuring one point per minute whether overdue or too early in arriving at checking stations. Three minutes will be allowed in controls.

RECORD AUTO RUN FROM PARIS TO NICE.

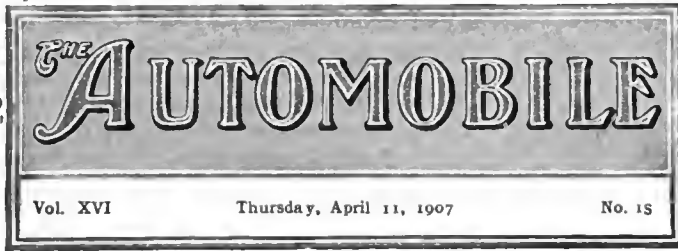
PARIS, April 1.—Sorel, the Anglo-Saxon who converted Indian rajahs to automobiling, has set all Paris a-talking by a fast run to Nice on a 60-horsepower stripped touring car. He started from the capital at 2 o'clock in the morning, officially timed, and despite the darkness rushed along at an average of 35 to 40 miles an hour, guided by powerful headlights. Auxerre was reached at daybreak, Avallon, 140 miles from the capital, was rushed through at twenty minutes past 5, and Lyons was traversed at twenty-seven minutes past 9. Passing by way of Aix-en-Provence and Fréjus, the Casino at Nice was reached at seven minutes past 6, the entire distance of 611 miles having been covered in 16 hours 15 minutes. Deducting one hour and twenty minutes on the road for food and gasoline, the actual running time was 14.5 hours, and the average speed over 42 miles an hour. Sorel has broken all Paris to Nice records by this run.

HYDROPLANE BURNS AT MONACO MEET.

MONTE CARLO, April 9.—Excitement was caused here to-day when the ten kilometer hydroplane race was started. There were four competitors, *Nautilus*, *Motogodille*, *Glisseur*, and Comte de Lambert's boat with an aerial propeller. Just over the line the last named craft burst into flames owing to a broken feed pipe allowing the gasoline to escape. Attempts to put out the flames with water proved unsuccessful, and had not a committee boat rushed up with a patent fire extinguisher there would have been a disaster.



COMTE DE LAMBERT'S UNIQUE HYDROPLANE ON THE SEINE, PREPARING FOR THE MONACO RACES.



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Balance of Trade Seen to Favor American Makers. Statistics can hardly be said to form reading of a wildly interesting nature, as a general rule, so that the message they convey is all too frequently lost on the man in the street. To him they are usually forbidding arrays of figures—meaningless except to those directly interested in their compilation. It is hardly necessary, however, to emphasize the vital significance of the message conveyed by a comparison of the import and export returns for the month of February of the present, as well as for the period of eight months preceding the latter, the detailed figures of which are given elsewhere in this issue. The fact that placing these totals together shows an excess of some \$165,000 in favor of the American builder means a great deal more than can be conveyed in a few words. It is not such a great while ago that there were no American automobiles at all, and for some time after that there was a period when there were no real automobiles built in this country—even their creators could not stretch natural pride in their own offspring to the extent of placing them in the same class as the foreign machines.

In the few years that have elapsed the whole face of things has been changed. The United States can boast of a greater number of automobiles in constant use than any other country in the world, and in consequence a greater annual output of machines. Judging from the steady upward trend of the American exports in this field, it will not be very long before a similar claim to supremacy may be established here also. The present showing means that in less than five years there has been created a vast American industry—so great that its surplus products are al-

ready to be found in every part of the globe in competition with those of French and German makers, who were already well experienced long before the American maker decided to take a hand. It means further that the value of the automobiles now sent abroad every month exceeds that of the foreign cars brought here, though the buying of the latter has increased enormously in the same period. There will be noticed a startling disparity between the number of cars which go to make up the valuation in each case—a fact that may be taken to indicate that the American maker caters largely to what foresight tells him will ultimately constitute the bulk of the demand—the popular-priced car.



Thorough Testing Out on a Safe Side the Industry. There is one thing that every well-established automobile builder in this country dreads—the specter of overproduction. That it stalks abroad most prominently when the industry as a whole finds itself at the opposite extreme—with well-filled order books, plants running full-handed and overtime in the attempt to keep up with the demand; is quite evident. It is from such conditions that overproduction is most apt to spring. The evil is one that has threatened the industry from time to time throughout the course of its existence—on occasion, seriously, but never less than at the present moment, and as long as present influences retain their power as controlling factors in this direction the danger could hardly be more remote and yet exist.

As an evidence of what is intended by influences in this respect, there may be cited the single illustration of the great pains taken by the makers of high-grade automobiles, not to mention the amount of time and money that are expended, that they may merely satisfy themselves that the cars are fully up to the high standard set, and that they may conscientiously say that nothing in reason has been left undone to make certain of the fact that the car is a perfectly built and perfect-running machine when it leaves their hands. If this alone were the only means taken, it would still remain a powerful factor—in reality it is but the culmination of an almost endless chain of inspections and tests through which every part of the car has passed. As long as every component that enters into the finished automobile is conscientiously inspected and tested and as long as the chassis is put through a trying-out process that thoroughly guarantees its integrity, there is little fear of overproduction—such methods are not consistent with an excess output.



Auto Publicity Exports Are Busy These Days. The constant repetition of a name in print is cumulative advertising that unquestionably results in making the public acquainted with the object so persistently referred to. Some of the publicity experts of automobiling, in their endeavors to bring forth something new and startling which will result in the appearance of the much desired name before the public, are hard put these days for inventing something which has not already been utilized and worn more or less threadbare. If these indefatigable seekers of attention succeed in whatever they undertake, none should begrudge them the results of their labor.

But the general public is beginning to discriminate between what might be designated as substantial publicity and that which is of the frothy sort. The automobile is asked to do all sorts of stunts, and some of these performances prove little and perhaps give an erroneous impression. For instance, of what actual value is it to quote but one instance, to be able to say that the motor of a car ran so many hours and so many days with the bonnet sealed up? Is it a guarantee to every one who buys a car of the same make that he can safely do likewise? Hardly. True it is that a motor which can perform its duty for continuous hours without attention of any sort has performed creditably, but at the same time simply because it may have had some trifling minor trouble, remedied in a few seconds, it should not be given a black mark and its efficiency questioned.

AUTO BILLS IN NEW YORK'S LAW MILL.

ALBANY, N. Y., April 8.—But three motor vehicle bills have been moving in the Legislature the past week, and one of them to which auto owners had no objections has become a law as Chapter 127, laws of 1907, by the Governor's signature. This was G. H. Whitney's bill relating to charge of tolls on bridges and toll roads. As it is a law, automobilists should be acquainted with its provisions. It provides that the owners of toll roads and bridges may collect from "every vehicle propelled by other than animal power, passing over the same, a toll rate not greater than the maximum rate allowed by law to be charged for the passage of vehicles drawn by two animals, provided that for such motor vehicles designed to carry only two persons the rate of toll shall not exceed the maximum rate allowed by law to be charged for the passage of a vehicle drawn over such a road or bridge, without a load, by a single animal."

Of the other two bills only one is actively moving and out of committee, and that is the Young auto-insurance bill. This is a perfected substitute copy of the bill which Mr. Young introduced and passed through the Assembly only to have it amended and finally stopped on third reading in the Senate to enable him and Senator Saxe to introduce the new substitute bill. The same idea of permitting the formation of companies to insure automobiles is involved, but this is the wording of the new section to cover it which is now said to be satisfactory: "against loss or damage to an automobile resulting from collision, and against loss by legal liability or damage to property resulting from collision of an automobile with another automobile, or vehicle, or object."

The Brough bill, amending the impounding and bail section of the present motor vehicle law, is reprinted as last changed and back in house committee on general laws, where it awaits an agreement between the introducer and President O. A. Quayle, of the New York State Automobile Association as to date of further hearing.

The latest freak bill introduced was that of Assemblyman Brooks, of Erie, which requires motor vehicles to be equipped with fenders when using the highways for the protection of life and limb of persons coming in contact with them. It has been referred to the general laws committee.

All other bills are resting in committees.

NEWS OF THE AERO CLUB OF AMERICA.

At the weekly Monday night session at the clubrooms, No. 12 East Forty-second street, New York City, Capt. T. T. Lovelace gave an illustrated lecture on Jamaica a few days after the earthquake. Some of the views were taken from a balloon.

Next Monday night A. M. Herring, a well-known aeronaut, will give a lecture on aeroplanes. Nikola Tesla is one of the speakers of the near future.

On the opening day of the Jamestown Exposition Capt. Lovelace, Alan R. Hawley and A. N. Chandler are to participate in a balloon race. On Saturday, at Philadelphia, Mr. Hawley, in the *Orient*, and Mr. Chandler, in the *Initial*, expect to make a joint ascension.

GLIDDEN CUP RULES TO REMAIN UNCHANGED.

Despite the fact that the Executive Committee of the N. A. A. M. at its session last week passed a resolution asking that the rules of the A. A. A. tour for the Glidden trophy be more or less modified and made less strenuous in character, the Executive Committee of the A. A. A. Touring Board will not make any changes in the rules as originally announced. Chairman F. B. Hower believes that the rules should result in a satisfactory contest, but if his committee finds a decided call for the addition of a runabout class a special cup may be offered for runabout entrants. A dozen or more have come forward and announced their intention to compete in the teams of A. A. A. clubs. It is predicted the list will exceed a hundred.

SUIT SUPPLIES SOME SELDEN STATISTICS.

On Monday and Tuesday of the present week the action in equity brought by the trustees in bankruptcy of the defunct Searchmont Automobile Company, of Philadelphia, Pa., against the Association of Licensed Automobile Manufacturers, was heard before Justice O'Gorman in Part VI, Special Term, of the Supreme Court, in New York City. The plaintiff contends that the association is a partnership, and as such, one thirty-first part of all profits made since the former Searchmont Automobile Company became a member in 1903 is due the latter, and accordingly constitutes one of its assets in bankruptcy. Prior to the hearing of the trial an order was granted by Justice Leventritt to inspect the books of the association and the report of an expert accountant thereon was placed in evidence.

It showed the income of the association during the period in question to have been some \$615,000 in round numbers, composed in part of \$82,500 in initiation fees and \$518,000 in royalties received under the Selden patent; its expenditures during the same period were \$228,342 for litigation and \$223,902 for administration, leaving a balance on hand of some \$163,000. The item for legal expenses was composed in part of \$114,100, for carrying on the action against the Ford company; \$15,350 for that against the Panhard company, and \$4,600 for the present action, all these figures only being carried down to December 31, 1906; they date back to March 15, 1903.

Among the witnesses called were E. H. Cutler, general manager of the association; Marcus I. Brock, assistant manager, and William S. Redding, of Redding, Kiddle & Greeley, patent attorneys, of counsel to the association. Mr. Brock testified that the association did not make a cent of profit from the 1906 show in the Garden, nor for that matter from any show it ever held. In that year between \$20,000 and \$30,000 was cleared, but it was all returned to the exhibitors in the shape of rebates.

During the course of Mr. Redding's testimony the fact was brought out that the Ford suit would come up for argument next Fall. All the rebuttal testimony is in and sixty days have been granted for the surrebuttal. The record now covers 6,000 pages. Asked the value of the Selden patent, Mr. Redding said it was impossible to state it, but denied having expressed the opinion that it was worth \$10,000,000. He was also examined at length regarding the formation of the Association Patents Company. The court granted an adjournment until Monday next for the preparation of briefs.

SECRETARY ELLIOTT'S WESTERN ROUNDUP.

Frederick H. Elliott, secretary of the A. A. A., this week is engaged in a Southern-Western trip which will have more or less to do with State associations in Maryland, Kentucky, Indiana and Missouri. President W. H. Hotchkiss is seeing to it that the national secretary is a busy man, but at the same time he is doing his share of the work. Tuesday night he was an invited guest at the annual meeting of the Pennsylvania Motor Federation at Pittsburg. Before the completion of his administration President Hotchkiss anticipates State bodies across the entire country.

During Secretary Elliott's Western trip there will be a conference at Indianapolis of Western manufacturers interested in the proposed stock car race to follow in October next the Vanderbilt cup event on the Long Island Motor Parkway.

BOSTON TO RETAIN MARCH SHOW DATES.

BOSTON, April 8.—Notwithstanding the fact that the other large shows will be held several months earlier than usual next season, the Boston Automobile Dealers' Association does not propose to change the date of its annual exhibition. At a meeting of the association a day or two ago the subject of an earlier show was discussed and it was decided to make no change, but to hold the 1908 show in the middle of March, as has been the custom for some years past.

COURT UPHOLDS THE OWNER'S RIGHT.

Automobile insurance is an institution of such recent inception that there has not been sufficient time for the courts to establish any precedents, so that any decisions in this connection are of interest to autoists generally. In two actions instituted by Veryl Preston against the *Ætna* Insurance Company and the Union Assurance Society, the Appellate Division of the Supreme Court in New York has upheld the right of the owner to recover under the long-established ruling in insurance litigation that where a provision in a policy is capable of being construed in two ways, that most favorable to the insured should be accepted.

Mr. Preston insured his machine in both of the above-named companies for one year, the *Ætna* policy covering "all direct loss or damage by fire except loss or damage caused by fire originating within the vehicle," while the Union policy also excepted "any loss or damage to the automobile or any of its parts or contents caused by fire originating in the automobile itself." While thus insured the machine was run into a ditch and upset by the chauffeur between Pleasure Bay and Monmouth, N. J. The gasoline ran out of the tank, spreading over the surface of the water and took fire from one of the kerosene lamps on the machine with the result that the machine was considerably damaged. Both companies contended that they were exempt under the clauses in question, and the referee before whom the matter was heard sustained them.

Justice Ingraham, of the Appellate Division, in reversing the referee and granting a new trial, says in part:

"The lamp was not within the vehicle but was outside it, nor was the gasoline that ignited and from which the fire originated within the vehicle. If the gasoline had not escaped from 'within' the vehicle, it is quite evident that there would have been no fire. The defendant company was responsible for any damage caused to the automobile, by reason of the burning of the gasoline, whether it was in the tank or had leaked from the tank, provided the fire did not originate 'within' the vehicle.

"It is settled that if a provision in a policy is susceptible of two constructions so that reasonable men on reading the contract would differ as to its meaning, that construction will be adopted which is most favorable to the insured.

"It seems to me that this fire was not within the exception, and that the plaintiff was entitled to recover."

EXPORTS BEGINNING TO OVERLAP IMPORTS.

There seems to be little doubt that long before the end of the present year the numbers and values of American cars exported and of foreign cars imported will have reached a point where the balance of trade will finally incline in the American maker's favor for the first time. That the culmination of the long uphill struggle against great odds is close at hand, is evident from the following figures. During the month of February of the present year there were 62 complete cars imported, valued at \$203,106, while during the same month there were 213 American cars exported, having a total valuation of \$386,309. This shows the substantial excess of \$165,203 of exports over imports, which is offset to some extent by the fact that during the period of eight months ending with February, 1907, there were 831 cars, valued at \$2,938,893, imported, while the valuation of the 1,582 cars sent out of the country was but \$2,471,859. It is only during the period in question that the value of American exports has reached a point so closely approximating that of the imports.

AUTO SCOOTERS TO REACH THE NORTH POLE.

No less than six automobiles, patterned after the euphoniously-named Long Island scooter, are said to be building for various Arctic explorers, who will use them in attempts to reach the Pole during the summer of 1908. Two of them are under construction for Dr. Frederick A. Cook, of Brooklyn, who once accompanied Peary, and a third is for Anthony Fiala, of Ziegler expedition fame, while the remainder are for other expeditions. Apparently no field is closed to the gasoline motor.

BOSTON-NEW YORK MOTORWAY SUBSIDIES.

BOSTON, April 8.—The scheme for an air-line highway exclusively for automobiles between this city and New York was given its quietus for the current year by the legislative committee on roads and bridges, which this week reported leave to withdraw on the bill for the incorporation of the company, which proposed to take land by right of eminent domain and build the double road highway at a cost of between \$12,500,000 and \$15,000,000. Just what particular arguments led the committee to decide against the bill are unknown, but at the hearing the committee men appeared to be suspicious that the bill was a disguised attempt to secure a railway right of way, and they were also somewhat skeptical of its financial soundness. Similar bills are pending in Rhode Island and Connecticut.

The action of the committee on roads and bridges on the highway bill is in line with its attitude toward all automobile legislation this year. Of the eight or nine measures brought before it, it has reported favorably on only one, and that is of minor importance, affecting only private roads. It still has under consideration the Governor's recommendation for an examining board for chauffeurs. The taxation committee still has under consideration the bill for an increase in the registration fees by means of a sliding scale based on horsepower.

TIRES WITH THE CAR ARE DUTIABLE.

WASHINGTON, D. C., April 8.—The Treasury Department has been advised of a decision of the Board of General Appraisers adverse to the importers in the case of the Auto Import Co., et al., against the Collector of Customs at New York. Complete automobiles "with tools and accessories," so-called, were the subject of the controversy. Duty was assessed on the cars as enterities at the rate of 45 per cent. ad valorem under the provisions of paragraph 193 of the existing tariff act, metal being the component material of chief value therein. The importers claimed that the tires, being made of rubber, were separately dutiable at 30 per cent. under paragraph 449. No objection was made to the assessment as made by the collector on the body of the automobile as distinguished from the chassis, although it was in chief value of wood, nor on the cushions, although they were in chief value of leather.

In its decision the Board stated that the claim set up by the importers was opposed to both reason and authority. "Just why the tires are not as much a part of the machines as the chain, gearing, the wheels, the brake, the seats, the wooden body, etc., has not been made clear to us," continued the Board. "The tires accompany each machine; are packed in the same case with it; they are of the particular size for and are intended to be used on it, and without them the machine would be practically useless."

MAINE LEGISLATURE ACTED WISELY.

PORTLAND, ME., April 8.—Judging from action taken by the Maine Legislature, the movement for good roads has received an impetus that will insure still further action along this most desirable line of improvement. The Legislature appropriated for the development of the highways of the State the sum of \$120,000. State Highway Commissioner Paul D. Sargent has been an earnest advocate of the good roads movement, and since assuming office, two years ago, has lost no opportunity of impressing upon the minds of the public the need of better highways for all vehicles as well as automobiles.

Maine automobilists are congratulating themselves upon the death of a very drastic measure introduced in the Legislature to regulate the speed of automobiles in cities and towns. This act was presented by representative Proctor, and provided that five miles an hour should be the maximum speed in cities and towns of the State unless those cities and towns otherwise direct. Through the efforts of Representative Walter J. Mayo the measure met its death in the House even after it had been favorably reported by the committee.

PITTSBURG'S SUCCESSFUL SHOW.

PITTSBURG, April 8.—The first automobile show in Pittsburg opened at the Duquesne Garden to-night with great eclat. Mayor George W. Guthrie pressed the electric button that started the big show and in the presence of over 2,000 people who were representatives of Pittsburg's army of 5,000 enthusiastic autoists. It was a brilliant assembly, and when the thousands of electric lights were turned on and the rare beauty of the gold and green setting brought out fully, Pittsburg had abundant reason to be proud of her show. Over \$400,000 is shown in the exhibits. Nearly thirty manufacturers are represented on the green baize floor, and in the gaily decorated booths there are complete lines of automobile accessories.

It was in 1899 that William N. Murray started the first automobile establishment in Pittsburg, and was roundly ridiculed by his business associates for making such a foolish venture in a hilly town. It is the pleasant irony of fate that Mr. Murray, now

would even suspect that there had been unwonted haste in getting the show proper together.

A fine musical program has been prepared for every evening of the week and special programs will be rendered Wednesday and Saturday afternoons. Another pleasant feature of the show is the speedway in Craig street, in front of the Garden.

BRITAIN'S ROYAL A. C. TO ASSIST TOURISTS.

From J. W. Orde, secretary of the Royal Automobile Club of Great Britain and Ireland, has come the following letter to Georges Dupuy, manager of the American Gold Cup Tour:

Georges Dupuy, Esq., New York City, U. S. A.

Dear Sir: I shall be pleased to give you every assistance possible in connection with the tour of American cars which you are organizing. There are no custom formalities in connection with cars entering England, but it is necessary to obtain licenses. If you will let me know how many cars and how many drivers there will be in the party, I will send you the necessary blank



DUQUESNE GARDEN'S AMPLE FLOOR IS THIS WEEK THE SCENE OF PITTSBURG'S AUTO SHOW.

president of the Standard Automobile Company, is the man who first conceived this show and has done his utmost from the start to make it a great success.

The show committee consists of W. H. LaFontaine, J. H. Cochran and Earl Kiser. The show is being given under the auspices of the Automobile Dealers' Association of Pittsburg, which comprises sixteen of the representative firms in this city. The proceeds of it will be turned into a fund of the association, with a view to further promoting the interests of automobiling in Greater Pittsburg in future times. It was contended by some dealers that the profits should be divided pro rata among the exhibitors, but this idea was ruled out at the end.

The show committee did not get possession of the Garden until Sunday noon, owing to the fact that a dog show had been held there the previous week. This made the task of getting the new floor, stands, booths, decorations and furnishment in order by 8 o'clock Monday night one almost herculean. It was accomplished by the dint of tremendous exertion, and many exhibits were not in place till late Monday afternoon. But when the fashionable assemblage gathered in the evening very few

application forms for licenses. I see no objection to the route which you propose following through England, but instead of crossing from Calais to Dover, I would strongly recommend you to cross from Boulogne to Folkestone, as the arrangements for shipping cars on the Boulogne route are much better than on the Calais route.

I should be pleased to extend to the members of your party the special club custom facilities, and I enclose a form by which you will see that all custom formalities in connection with the introduction of cars into France, Germany, Switzerland, Holland, Belgium, Italy, and Austria may be settled here before leaving. I enclose a couple of forms, which will show you what particulars of the cars are required and they also give the various amounts which have to be deposited for the different countries. You may depend upon me to do everything in my power to make your tour a success.

If you let me know the date of arrival in Havre, I will instruct the Club agent there to meet your party on arrival and to make arrangements for the issue of the necessary French licenses without delay. It will only be necessary to take over two unmounted photographs of each driver (head and shoulders only), measuring about 1 1/2 inches by 1 3/4 inches. The agent will attend to all details for you, but as there are so many it will probably facilitate matters if you let me know the make and horsepower of each car, the names of the owners, and the name of each driver.

Yours faithfully, J. W. ORDE,

London, England.

Secretary, Royal Automobile Club.

THE MAN WHO GAVE THE MARSH RIM ITS NAME.

It is frequently as much of a wonder how a thing happened to come by its name as how it came to be invented. This is the case of the Marsh quick detachable rim, which is about equally well known by that cognomen as by its other—the Diamond rim—



W. A. MARSH.

owing to the fact that it is owned and always has been controlled by the Diamond Rubber Company. In this case it took its name from its inventor, W. A. Marsh, of Columbus, O., whose portrait appears herewith, and it first received this appellation at the hands of its original makers, the Bryant Steel Wheel and Rim Company, of the same city. It is one of those little things that cause people who note its simplicity to marvel at the fact that no one thought of it long previously, and one with which, by the way, the inventor did well financially.

The demand for Diamond tires on the Marsh quick detachable rim has been unusually large since the beginning of the year and indicates that the call for easily dismounted tires will be a very important factor during the coming season.

BROKAW LETS SELDEN ACTION GO BY DEFAULT.

Attention is being called to the granting of a decree by Judge Chatfield, sitting in the United States District Court for the Eastern District of New York, awarding an injunction and an accounting of profits and damages, with costs, in favor of the Electric Vehicle Company, owners of the Selden patent No. 549,160, and stress is being laid on the fact that the defendant did not contest the action. Back in 1902 William Gould Brokaw bought a 14-horsepower Renault car, and, in common with many others, was promptly sued as an infringer of the patent. The majority of those who imported cars and were thus sued capitulated; Mr. Brokaw did not. In fact, he sold the car long ago—as far back as 1903—but the action remained on the calendar, and, in the fullness of time, it was reached. To contest it would have cost the defendant two or three times the original worth of the car, so that he permitted the suit to go by default and the Judge could not do otherwise than grant the plaintiff the entire relief demanded. As a result, Mr. Brokaw is forever enjoined from using the car he sold four years ago or importing or making any others, and must account for all profits and gains he made thereby, to which end B. Lincoln Benedict has been appointed master to take an accounting.

HOW AN AMERICAN MORS WAS UTILIZED.

From Camden to Atlantic City, N. J., the exact running distance is 58.3 miles, and through a driving rainstorm early on a recent Sunday morning a 40-52-horsepower American Mors carried two men and 1,000 pounds of Sunday newspapers in 69 minutes.

No accident marred the fast trip, which, however, attracted the attention of J. B. R. Smith, Commissioner of Motor Vehicles for New Jersey, and he took occasion to condemn the *New York Herald* for its violation of the speed laws of the State.

Recently there has been considerable discussion in several States as to the advisability of doing away entirely with speed limits and making the driver of an automobile or any other vehicle responsible for whatever damage might be caused no matter at what speed the vehicle might be traveling. It is the general impression that sooner or later legislation of this character will be universally adopted both here and abroad.

OLDSMOBILE MUDLARK ON 1,000-MILE NON STOP.

PHILADELPHIA, April 8.—Promptly at 9 o'clock, Saturday morning, the engine of the Oldsmobile "Mudlark," which came into the limelight when it successfully accomplished a trip from New York to Florida last winter, was cranked by William Folbarth, of the Oldsmobile factory at Lansing, Mich., and a few minutes later, with a bunch of local pressmen aboard, started up Broad street on what is intended to be a 1,000-mile non-stop run. It is hinted that if at the end of the scheduled distance the engine is running as well as expected the trial will be continued indefinitely. With O. W. Hoffman, T. W. Berger, John Taliss and Mr. Folbarth—all experienced drivers—to coddle the engine and keep it running, no trouble is anticipated in completing the 1,000 miles about Thursday morning. No attempt at speed will be made, and Manager G. Hilton Gantert, manager of the Motor Shop (which handles the Oldsmobile here), who is engineering the run, confidently expects the "Mudlark" to live up to its reputation should the expected April showers make the going heavy on the suburban roads.

BERKSHIRE COMPANY HAS BEEN REORGANIZED.

PITTSFIELD, MASS., April 8.—The Berkshire Automobile Company has been succeeded by the Berkshire Motor Car Company, the new concern having purchased the assets including plant, patent rights, finished cars, and shop equipment. The new company has just increased its present facilities 50 per cent. and installed the latest improved machinery to manufacture the well known Berkshire cars. The capitalization of the new concern is \$400,000, \$100,000 preferred and \$300,000 common stock, the new capital being secured by a bond issue of \$100,000 which is to be devoted to the development of the business.

The new company will build the 35-horsepower Berkshire model exclusively, the same chassis being fitted with either a runabout or touring body. H. D. Sisson has been elected treasurer and general manager of the new company, and a complete list of officers will be announced at an early date, as soon as the full details of the reorganization have been formulated and completed.

UNINJURED, BUT DEMOLISHED THE HOUSE.

A Rambler automobile was being tested on the factory track, when, in trying to pass another car by cutting inside, it struck an oil house standing on the edge of the track. The blow was so forcible that the machine swung round nearly ninety degrees, with disastrous results to the building. The remarkable feature was that as the force of the impact was taken by the left front wheel and the spring extension of the frame, the machine suffered no injury whatever. The experiment will not be repeated, for the Rambler people need their buildings.



WHERE THE RAMBLER BUTTED INTO THE OIL HOUSE.

BROAD PATENT ISSUED ON ELECTRIC VEHICLE.

With the issue of letters patent No. 845,105 on February 26 last to H. P. Maxim and the Electric Vehicle Company, there is strikingly recalled what may well be termed almost the entire span of life of the motor vehicle industry in this country, for the application for the patent was filed on May 26, 1899, a time when the electric was about the strongest factor in the field. The frames then in use extended from axle to axle and their length and design had to be changed for almost every slight variation of the chassis, so that every builder in the business was developing a great variety of frames and running-gear elements, a broad patent granted to A. L. Riker some time previous being considered to dominate the situation.

Mr. Maxim conceived the idea of employing a complete steering truck carrying the spring suspension, axle and wheels, and a second truck independent of the first, also embodying the same elements and adapted to have the motive power transmitted to it. By this arrangement it was possible to make the two elements in standard sizes adaptable to bodies of various types and sizes. This interchangeable system attracted considerable attention abroad and resulted in successful negotiations for its exclusive use by certain prominent builders on the Continent. Not a few of the original vehicles constructed on this principle are in use to-day. The patent just granted is very broad in its specifications.

SELLING AUTOMOBILES AT AUCTION.

The first auction sale conducted in New York City by the recently organized Automobile Auction Company of America was held last Tuesday, and, despite the storm, over 100 people were present. Several cars were sold, among them being an electric victoria in good condition, "knocked down" for \$125; a 1905 16-horsepower Clement-Bayard for \$1,150, and a 1904 24-horsepower Berg for \$910. The company conducting these auctions recently leased the entire building at 41-43 West Sixty-third street and announces its intention of conducting sales weekly. J. Hatfield Morton is the auctioneer. When the cars are offered their exact condition is stated, and the sales are made with the condition that the purchaser will have his deposit returned if the vehicle is not satisfactory. For two days previous to the sale the cars are demonstrated to possible purchasers. A similar company has been in existence in London for several years, and disposes of many cars annually. While there have been several automobile auctions held in New York City, this company is the first to organize the business on similar lines to those practised by legitimate firms in the horse and carriage trade.

LOGAN ADVANCES PRICES ON SEMI RACER.

Owing to advances in cost of labor and materials, as well as the fact that the design of the car has been developed far beyond the original estimates, the Logan Construction Company, Chillicothe, Ohio, have found it necessary to advance the price of their "Blue Streak Semi-Racing" type to \$1,750, the increase to become effective on May 1. The new price includes full equipment, consisting of top and lamps, but orders will be received up to May 1 at the old price of \$1,500 without top.

MAXWELL CARS MAKE SUCCESSFUL RUN.

In charge of H. A. Grant, of the Maxwell-Briscoe Company, the three cars of the latter made a most successful run from Trenton to Atlantic City, N. J., last week, using alcohol, kerosene and gasoline as their respective fuels. The official observers were H. de G. Robinson of the Automobile Club of America, and S. Y. Beach. It is expected that the official report of the run will be of considerable practical value.

IMPORTERS' JANUARY SHOW UP FOR SANCTION.

Following the steps already taken with a view to the holding of a show of imported cars later in the season, owing to the recent developments in the show situation, a sanction for a January date in Madison Square Garden has been applied for by the Importers' Automobile Salon, Inc., and was up for consideration by the Board of Managers of the Association of Licensed Automobile Manufacturers at its meeting on Tuesday last. The subject was referred to the show committee, to which the following members were elected: Colonel George Pope, Pope Manufacturing Company, chairman; Charles Clifton, George N. Pierce Company, and C. R. Mabley, Smith & Mabley, Inc. Charles Clifton, who is also the president of the association, succeeds Marcus I. Brock as member of the show committee. Mr. Brock was relieved of show duty at his request, owing to increased demands upon him as assistant general manager. The following companies were represented: Apperson Bros. Automobile Co., Sel-den Motor Vehicle Co., Buick Motor Co., Cadillac Motor Car Co., Electric Vehicle Co., H. H. Franklin Mfg. Co., Hewitt Motor Co., Knox Automobile Co., Locomobile Co. of America, Northern Motor Car Co., Olds Motor Works, Packard Motor Car Co., Peerless Motor Car Co., George N. Pierce Co., Pope Mfg. Co., Pope Motor Car Co., Royal Motor Car Co., Alden Sampson, 2d, Smith & Mabley, Inc., F. B. Stearns Co., Stevens-Duryea Co., Studebaker Automobile Co., Waltham Mfg. Co., Winton Motor Carriage Co.

A NEW JERSEY ROAD TO BEWARE OF.

Cortland Field Bishop, chairman of the A. C. A. Maps Committee, asks that public attention be called to the abominable condition of the highway between Rahway and Metuchen, N. Y. Owing to faulty construction and neglect, upheavals have occurred on the road and there are mounds at frequent intervals three feet high. Only a few days ago, while traveling over this stretch, the macadam gave way and Mr. Bishop's machine sank down on one side to such an extent that it was in danger of overturning. With the aid of a team it was over two hours before the automobilist could be extricated. A similar fate befel a large observation car.

FOUR DRAGONS FOR THE A. A. A. TOUR.

Official entrance of four Dragon cars has been made in the coming A. A. A. tour for the Glidden trophy. H. T. Branstetter, of the Chicago Automobile Club, and agent for the Dragon car in Chicago, is one of the entrants; John Kane Mills, of the Quaker City Motor Club, of Philadelphia, and president of the Dragon Automobile Company, is another, and A. L. Kull, of the New York Motor Club, and New York agent of the Dragon, is a third entrant. The name of the entrant of the fourth car has not yet been announced.

THREE STEARNS FOR THE A. A. A. TOUR.

F. B. Stearns, president of the automobile company of the same name, has written the Cleveland Automobile Club asking for the honor of representing it in the annual A. A. A. tour for the Glidden trophy. Mr. Stearns states that his company will enter as many machines as the club may designate, but not less than three, these to be driven by such well-known operators as Holden, Vaughan and Leland. The cars used will be the regular 30-60-horsepower 1907 type.

Montpelier, Vt.—The Pavilion Hotel livery stable at Montpelier, Vt., which has been closed for some months, has been leased by John J. Glinney, who will fit up the basement for an automobile garage. It will be opened for business about the first week in May.

SPARK COIL COMPANY TO QUIT PITTSFIELD.

A half interest in the Pittsfield Spark Coil Company has been obtained by Zenas Crane and Senator W. M. Crane. Concurrently with this news comes the announcement that the company will move from the present factory in Pittsfield, Mass., to the larger Crane factory at Dalton, Mass., recently vacated by the Dalton Shoe Company. A lease for five years has been obtained, with the privilege of buying the property at the expiration of that time. A much-needed gain in space will be made by the removal, which is expected to be terminated by July 1, the new factory having 33,600 square feet of floor space, compared with 11,000 square feet in the old building. William P. Wood, treasurer and manager, to whose well-directed efforts the company's marked success is due, will continue to look after its interests.

HOUPT ON VANDERBILT CUP REASONS.

"What bearing has the Vanderbilt Cup race on the selling end of the automobile industry?" is a question that is often asked. Harry S. Houpt, New York City agent for the Thomas, who entered one of the Thomas racers in the Vanderbilt last year, had this to say when the question was put to him:

"Prestige; that is the answer. It would redound to the good of the entire American industry. If I had merely been seeking advertisement last year I would have entered a stock car. But we are influenced by a stronger motive in contesting for the big prize. We want to win that cup from a sporting standpoint, and we know that unlimited benefit will come to the American industry as a whole if we do."

"THE WHITE HOUSE" OF L. I. PARKWAY.

The White Company, of Cleveland, through President Windsor T. White, has made formal application to A. R. Pardington for a plot of ground adjacent to the Long Island Motor Parkway. When the purchase is completed there will be erected on this plot a commodious headquarters for the use of owners of White steamers and their guests. The structure is to be called "The White House," and, as there are over a thousand White owners in Greater New York and vicinity, the building will be of no mean proportions.

THOMAS TO MAKE A HIGH POWERED RUNABOUT.

Within thirty days a new high-powered runabout will be placed on the market by the E. R. Thomas Motor Company, of Buffalo, N. Y. The most distinctive feature of the new model is a special motor of great power with four cylinders cast separately and a five bearing crankshaft. The price of this car is \$4,000.

NEXT SESSION A. L. A. M. MECHANICAL BRANCH.

At the next meeting of the Mechanical Branch of the Association of Licensed Automobile Manufacturers, to be held in New York, April 12, the subjects to be discussed will be self-starting devices, standardization of tires and rims, and alcohol as a fuel. These subjects have attracted the attention of the engineers of the branch for some time, and experiments and investigations regarding them have been under way. It is expected that some results of material value will be obtained and immediate action taken. The work of the committee appointed for standardization of tires and rims will be one of the most important accomplishments of the branch and in keeping with the standardization of bolts and screws and the adoption of uniform spark plugs.

ADDING TO THE AUTO INDUSTRY IN DETROIT.

DETROIT, MICH., April 8.—The Michigan Crucible Steel Castings Company, 248 Guoin street, this city, has been organized for the purpose of manufacturing crucible steel castings, and will make a specialty of catering particularly to the automobile trade. R. F. Flinterman, president and manager of the new concern, has recently severed his connection with the International Harvester Company, where for several years he has been in charge of its laboratories and foundry practice. Mr. McLeod, whose name is familiar to consumers of crucible steel castings, will have direct charge of the foundries. The company will be ready to produce castings by May 1.

PACKARD FACTORY CONTINUES TO ENLARGE.

Despite the great amount of enlargement that was designed and carried out during the past year at the Packard works at Detroit with a view to providing room for facilitating the handling of the 1907 output, the company has again undertaken building operations with the first sign of warm weather. Some idea of the extent of the plant may be gained from the accompanying photograph of it, which shows in addition the latest increase now in course of construction. This is to consist of a third story on the outside triangle that was built last summer. This is more than 950 feet long by 60 feet wide, and is of the same fireproof construction, using steel and concrete as the two lower floors. That the numerous additions planned and carried out during the past year or two have been a matter of wise foresight on the part of the Packard Motor Car Company, is evident from the fact that their tremendously increased facilities have made it possible to maintain deliveries well in advance of the schedule mapped out at the beginning of the season.



CAPACIOUS MANUFACTURING PLANT OF THE PACKARD MOTOR CAR COMPANY, AT DETROIT, MICH.

BRIEF ITEMS OF NEWS AND TRADE MISCELLANY

A two-story building is to be put up at 1452-1456 Michigan avenue, Chicago, for the Buick Motor Company.

An additional fifteen acres of land have been secured by the Buick Motor Company at Flint, Mich., to be used for experimental and testing purposes.

The Locomobile Company has had plans prepared for a four-story brick addition to be erected at its plant near Seaside Park, Bridgeport, Conn.

The interest taken by the king of England in all branches of automobiling is well known. In the matter of tires for his own cars, his majesty has ordered Continentals as the regular equipment.

The Phoenix Auto Supply Company, St. Louis, Mo., with A. L. Dyke as president, has increased its capital stock to \$12,000 fully paid in. A new catalogue has been issued by this firm which will be mailed on application.

A site has been purchased in the Black Rock district, Buffalo, N. Y., on which will be erected a \$30,000 plant for the Fedders Manufacturing Works, constructing square-tube radiators. The new premises will be occupied July 1.

The contract has been let for the erection of the big plant of the Maxwell-Briscoe Motor Company, at Newcastle, Ind., for \$150,000. The building will cover eight acres. Work will be commenced immediately and be continued night and day.

The Stackpole Battery Company, of St. Mary's, Pa., maker of the Elk Brand dry cells, is erecting a large addition to its already extensive plant. The improvement was necessary owing to the company's rapidly increasing trade. Night and day shifts have been working at the factory for some time.

Among the applications received for Truffault-Hartford shock absorbers, is one from Kenneth R. Otis, who had his four-cylinder Pierce Great Arrow equipped with the shock absorber last year, and has just written Mr. Hartford that he will have the six-cylinder Pierce Arrow equipped with a set of Hartford suspensions when he goes on the Glidden tour with it this year.

Although it has yet to celebrate its first anniversary, the E. R. Thomas Detroit company has found it necessary to make a material increase in the size of its plant. Recently a new testing barn was added and now plans have been accepted for two new buildings, while the details of a third are being considered. At the present time four Thomas Forty's are being turned out daily.

Georges Dupuy, manager of the American Gold Cup Tour, has received information from his Paris agent, John C. Hoveman, that the Mitchell Motor Car Company has entered a car in the tour to start from Havre. Mr. Sauerbach, manager of the Paris branch of the Mitchell Motor Car Company, has been very desirous all along that there be a Mitchell car in this tour. He has also proffered the use of a Mitchell to Mr. Dupuy for personal use while in Paris.

The factory and equipment of the Eishuth Horseless Vehicle Company, at

Middletown, Conn., have been sold at public auction by order of the United States Court in Bankruptcy. Everett J. Esselty, of New York, made the last bid of \$21,000, at which price he secured the property, subject to a mortgage of \$125,000. It is understood that the property was purchased for John W. Gates, of New York, and that business will be resumed and somewhat extended.

Traffic Manager Marvin, of the Association of Licensed Automobile Manufacturers, has just issued a warning to the members of the association regarding the shipment of automobiles. With the increasing shipments of automobiles coming on and the decreasing number of available and suitable freight cars, a situation is immediate that may result disastrously to some shippers. He strongly advises loading as many automobiles as possible in each freight car, if necessary, holding shipment until enough machines are ready to completely fill each car.

The historic Highland Park track at Detroit, Mich., will not be cut up into building lots, as was at first anticipated, at least not for the present. Instead, this summer will see some excellent racing at the former fort of the bangtails. The Ford Company has rented the grounds for the summer, and purposes to use the course for testing. The factory will hold a series of race meets for demonstrators each Saturday afternoon. The drivers will draw lots for cars, and percentages will be allowed according to the order of finishing. Records of the work of the drivers will be kept and at the end of the season cups and medals will be awarded the leading drivers.

In the business of automobile building as in many other lines, the progressive manufacturer usually has a choice of policies—he may devote all his energies to the building of a comparatively few high-priced cars, or to the turning out of a large number at a much lower figure. It seems somewhat of a coincidence that such a number of the members of the American Motor Manufacturers' Association should have chosen the latter policy on the basis that the ultimate demand would be for a comparatively low-priced car. Nearly all the small two-seated cars selling for \$1,200 or less—those that earned the original title of runabouts—are now made by members of this association.

The men who do the road testing of Thomas Flyers in and about Buffalo will be forced within the next few weeks to give up one of their favorite roadways. When the temperature begins to drop along the northern part of New York canalmen tie up their boats and go into winter quarters. As soon as they do the Thomas testers take to the tow path of the historic old Erie canal, where they may speed along to their hearts' content. This they have been doing all winter and the path has proven a good speedway. Now that spring is at hand the boat owners are beginning to end their hibernation period, traffic along the famous waterway is being resumed and the testers have been forced to take to the roads.

An illustration of how much work and expense is involved in combining simplicity and strength and reducing the

number of parts in the modern high-grade car, is found in a factory detail related by James Joyce, general manager of the American Locomotive Automobile Company. An interchangeable half-time shaft, having the cams integral with it, is a distinctive feature of the Berliet car. For making these accurately alike, so that each one will fit any car perfectly, machine work of great precision was required and this necessity called upon the resources of the locomotive concern for a new piece of machinery, which was duly created. By means of it, the shafts and cams are turned out from the solid steel bar, with a master cam compelling accuracy.

Someone counted up not long ago and found that there were sixty-four trades and professions represented in the work done on an automobile before it could be completed. At one of the factories in the country, however, that of the E. R. Thomas Motor Company at Buffalo, there is one which he did not include. It is that of interpreter. John Kruchten holds the position there, and he can write and speak English, German, French, Italian and Spanish. Most of Kruchten's work is concerned with the members of the foreign engineering department of the company. The men who compose this can all speak more or less English, but when technical matters come up and even the slightest mistake or misunderstanding must be carefully avoided, the interpreter has his work cut out for him.

RECENT TRADE REMOVALS.

The Uncas Specialty Company, of Norwich, Conn., has moved its New York office from 1555 to 1781 Broadway.

Leon Rubay, the well known importer of high-class sundries and ignition appliances, announces his removal from 140 West Thirty-eighth street to his new building, 1697 Broadway, New York City, between Fifty-third and Fifty-fourth streets.

NEW AGENCIES ESTABLISHED.

The Trident Tire Company, of New York City, has established a Philadelphia agency at 903 North Broad street.

New agencies have been established by the Wayne Automobile Company, of Detroit, Mich., as follows: Buffalo, J. A. Cramer, 737-741 Main street; Omaha, Bergers Automobile Company, 205 Farnam street.

A Wilkes-Barre sub-agency of the Ford Motor Company has been established through the efforts of A. A. Jones, of the Philadelphia branch house. The Pennsylvania Armature Works will handle the Ford in the Luzerne county metropolis.

The Atlas Motor Car Company, of Springfield, Mass., has placed the agency for the Atlas runabout with the Crane Automobile and Garage Company, of Providence, R. I., for that section. The Crane Company is building a fine new garage, which when completed will be one of the best in Rhode Island.

The Hercules Auto Specialty Manufacturing Company, of Los Angeles, Cal.

maker of the Hercules shock absorber, has established a Chicago office at 95 Dearborn street, and is having the Hercules manufactured in that city in large quantities by the Turner Brass Works. In the East the National Sales Corporation, 296 Broadway, New York City, is the factory agent.

The Electric Vehicle Company has closed its branch in Washington, D. C., which was conducted under the name of the Washington Electric Vehicle and Transportation Company. The Columbia agency has been placed with the Dupont Garage Company, which operates a large garage and salesroom at 2020-2030 M street, northwest. The garage in the Panorama building on Fifteenth street, formerly occupied by the Electric Vehicle Company's branch, will be used by the Dupont Company for its commercial business.

PERSONAL TRADE MENTION.

Mason B. McLaughlin, for some time connected with the selling force of the White Company's Philadelphia branch, will in the near future go to Cleveland as assistant to Vice-President Walter C. White.

General Sales Manager Charles B. Shanks, of the Winton Motor Carriage Company, accompanied by Mrs. Shanks, visited the company's branches in Boston, New York and Philadelphia this week.

Fred J. Pardee, of the Pardee-Canary Company, Chicago, has been appointed general sales manager of the St. Louis Car Company, of St. Louis, Mo., makers of the American Mors, vice George C. John, resigned. Mr. Pardee will resign as president of the Pardee-Canary Company, but will remain as a director in the concern, which handles the American Mors in Chicago.

G. C. Lewis, formerly of the Wayne Automobile Company of Boston, which last year represented the Wayne in the New England territory, is now at the head of the A. L. Kull Automobile Company, 1677 Broadway, New York agent for the Wayne and Dragon. Mr. Lewis is widely and popularly known in the trade, having been traveling representative for the Wayne prior to his Boston connection.

Benjamin Briscoe, chairman of the Committee of Management of the American Motor Car Manufacturers' Association, has gone to California for a rest and incidentally to look the field over

for a factory for Maxwell cars on the coast. He sailed last Thursday on the steamer *Proteus* for New Orleans and from there will go to Los Angeles, afterwards visiting San Francisco, Portland, Seattle and Salt Lake City. Mrs. Briscoe accompanies him.

Otis R. Cook has resigned his position as general western representative of the International Rubber Company, of Milltown, N. J., to accept the position of general representative of the Firestone Tire and Rubber Company, of Akron, O. Mr. Cook was connected with the B. F. Goodrich Rubber Company for twelve years, and went with the International people last August. He is one of the best known men in the tire selling trade, and one of the most experienced.

Not the least surprising of the recent name changes on the part of prominent personages in the trade, is that of Walter G. Morley, the announcement of whose resignation from the Aerocar Company, of Detroit, was hardly looked for. Mr. Morley has long been identified with the automobile industry, and though he is mum as to the new connection that has caused him to give up the secretaryship of the Detroit makers, it does not seem likely that he is now going outside of it. He has let it be known that he is to be even more prominently connected with another industry, but one intimately related to automobile building.

NEW TRADE PUBLICATIONS.

The Bay State Forty is a 40-horsepower touring car built by the Bay State Auto Company, of Boston, and embodying quite a number of distinctive features. A twelve-page booklet just published by its builders tells all about the new machine.

"Lozier Lessons" is the title of a small brochure issued by the Lozier Motor Company, Fifty-fifth street and Broadway, dealing in an interesting manner with the strong features of Lozier machines. Originality, easy driving, comfort, cleanliness, are a few of the twenty-two lessons that Lozier gives free to those who ask.

The 1907 catalogue of the Waltham Manufacturing Company, of Waltham, Mass., deals with a big line of models from 20-horsepower four-cylinder cars to small single-cylinder motors with friction drive. Each type is fully illustrated and described and sketches of the mechanical parts of the more important models are given. Pleasure as well as

light delivery vehicles are included in the catalogue.

Force-feed lubricators for automobiles and motor boats is the theme of the McCord & Co., Chicago, handbook. All standard types, each one designed with the view of meeting some particular requirement, but all embodying the principle of force feed by separate hydraulic pumps for each feed, working in unison, are fully described. Asbestos-lined gaskets, coiled-wire belting and McCord radiators are also dealt with in the well-produced handbook.

A MODEL BOSTON STORE.

E. L. Thompson, formerly of the Angier Company, has taken hold as manager of the Boston branch of the Post & Lester Company, whose headquarters are at Hartford, Conn. The new establishment, of which a



BOSTON STORE, 815 BOYLSTON STREET.

view of the exterior is pictured here, is centrally located in one of the busiest automobile districts of the Hub, and is one of the largest and best equipped accessory stores in that city. The interior is attractively finished in weathered oak, plate glass cases being employed to display the goods in a pleasing and effective manner. In addition to handling one of the most complete lines of accessories in New England, the company has secured the exclusive agency of the Continental tires, Splitdorf coils and a number of other well-known specialties. The store will be thrown open for business for the first time on April 12, and as Mr. Thompson has had considerable experience in the accessory line and is well known throughout New England, its success would seem to be immediate.



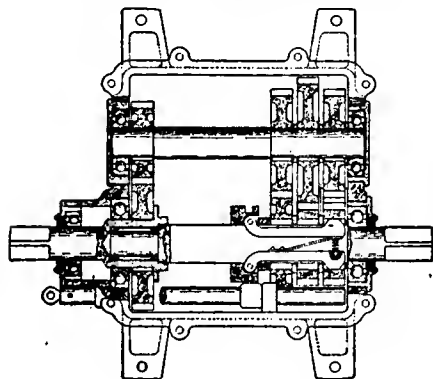
ONE DAY'S SHIPMENT OF THIRTY REOS, RECEIVED MARCH 30 BY R. M. OWEN & CO., NEW YORK.

INFORMATION FOR AUTO USERS.

The Schabinger Positive Gear Transmission.—Chas. H. Schabinger, Detroit, Mich., has produced a positive gear transmission which he claims will overcome the disadvantages of the different types of gearing now in general use. His invention relates to a sliding key transmission, with keys sliding in the slot of the main driving shaft; the ends of the keys are pinned to the shifting collar, which is moved backward and forward by the shifting fork; as the shifting col-

Louis, Mo. The engine is a 6-horsepower water-cooled single-cylinder two-cycle, 4 1-2 by 4 inches vertical. Transmission is of the friction type, the flywheel being faced with a composition metal disk 16 inches in diameter dressed on both sides. A 15-inch wheel works across the composition metal plate, contact being regulated by a ratchet foot lever. A hand lever shifts the contact wheel across the metal disk and any number of speeds may be obtained. Final drive is by means of a single roller chain from the countershaft to the rear axle. Ignition is by jump spark, the current being supplied by six dry cells. Three gallons of gasoline, enough for 60 or 80 miles, can be carried and the water tank and radiator hold about six gallons.

Gasoline Safety Devices.—The devices handled by the Non-Explosive Safety Naphtha Container Company, of 1133 Broadway, have a wide field of application and appeal very generally to automobilists. Among these devices may be mentioned a filler and safety cap for automobiles, which will prevent back draft and explosion when filling, also prevent incandescent flame from forming when a fire occurs with a tank filled



DETAILS OF SCHABINGER TRANSMISSION.

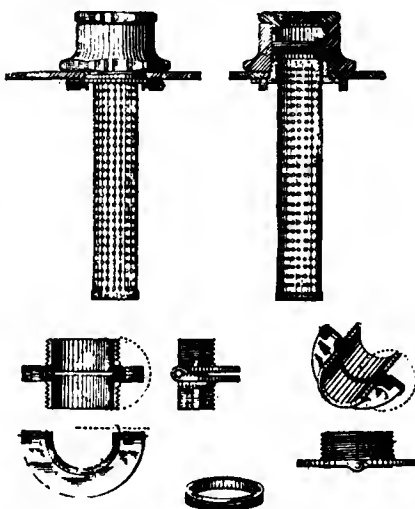
lar is moved along the driving shaft the free ends of the keys are forced into the double keyway of each driving gear wheel, by springs, thereby keying the loose gears on the driving shaft, causing power to be transmitted to the counter shaft, then back to the driving sleeve, which has a clutch formed on the power end. For direct drive the shifting collar is moved with the keys along the driving shaft until it meshes with the driving sleeve clutch, the free ends of the keys are then out of mesh with the gears, and rest on the inside of the thrust ring, allowing the gears to freely revolve. The inventor claims that this system will do away with stripping of teeth in changing speeds; in fact, change speeds may be made without releasing the clutch.

Light Weight Auto for Two People.—The A. B. C. machine is a construction of a very light two-passenger auto on the buggy principle, which will cost no



A. B. C. TWO-PASSENGER AUTO.

more than a horse and buggy, which will give much less trouble and which will travel over any road. The want is supplied by the Motor Vehicle Manufacturing Company, 1512 Locust street, St.



FILLER AND SAFETY CAP FOR AUTOS.

with the proper air and gas mixture for an explosion. It consists primarily of a safety cap and vent with a small ring of fusible metal which will melt at 200 degrees Fahrenheit, release the top plate and allow the gas to escape and burn on the outside of the container. The cap and diaphragms of gauge and perforated metal prevent the flame reaching the interior of the container, but allow the gas to pass out freely. An application of the same device is made to the tanks of automobiles in such a way that if a fire occurs the gasoline supply to the carbureter is shut off and the pressure released by the instantaneous opening of a safety valve. If the fire were allowed to continue it would burn itself out, but the tank would not explode. Applied to filler cans as used in garages, the safety device prevents any flame reaching the interior of the can; even should a light be applied to such a vessel it would burn harmlessly, and no flame would get inside to cause an explosion.

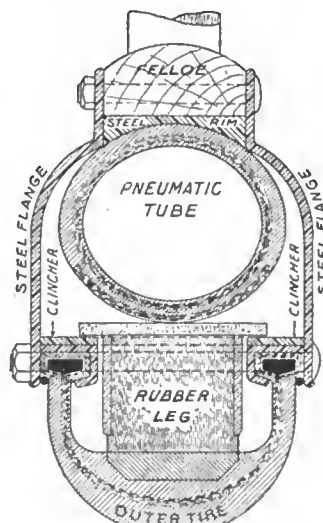
The "Cee More" Goggles.—The feature of these goggles is that they have curved amber lenses 1 1-2 by 3 1-8 curved at one end, square at the other, mounted in aluminum, fitted with leather trimmings. The amber glass is recommended by oculists on account of it



"CEE MORE" CURVED LENS GOGGLES.

being more restful to the eye than any other glass. The goggles are cool and comfortable, fit any face and give extra large vision. They fold up in small pocket case and are sent prepaid, with stick of anti-steam to prevent steaming of lenses. They are manufactured by the Bay State Goggle Company, 37 Prichard avenue, Somerville, Mass.

A New Non-Puncture Tire.—A glance at the cross-section cut of the Mitchell punctureless pneumatic tire, shown herewith, will clearly demonstrate the nature of this trouble-avoiding device. Attached to the felloe are a couple of steel flanges, holding within them an ordinary pneumatic tube. Secured to the end of the flanges is the outer shoe, the space between the tube and outer shoe being filled by a solid rubber leg or plug made in sections, each overlapping, presenting what is practically a continuous surface to the inner tube. The leg is held firmly in position by a metal clincher, through the sections of which it moves up and down freely, but without the slightest friction. With this construction the weight of a car coming or the tread of the outer casing forces the rubber leg upward, compressing the inner tube. The



CROSS SECTION MITCHELL TIRE.

air chamber being placed three inches under the outer shoe and protected on the sides by the deep metal flanges, can not be punctured. Inflation is effected in the ordinary way. The Mitchell punctureless pneumatic tire is manufactured by the Commonwealth Rubber Company, Reading, Mass. New York agents are Nash & Bartlett, 1001 Flatiron Building, New York.

An Article for the Ladies.—The Liscombe automobile veil is specially designed to protect the hat and hair from dust and the effects of the wind, while not unnecessarily obstructing the view or being heavy and cumbersome about the head. The veil passes over the hat, and attaches closely round the neck, thus



THE LISCOMBE AUTO VEIL.

the most elegant coiffure remains undisturbed even after a long automobile ride in an open car. These veils are made to order in all shades of silks and chiffons to match automobile cloaks and costumes by Lucia E. Liscombe, 119 Massachusetts avenue, Boston, Mass.

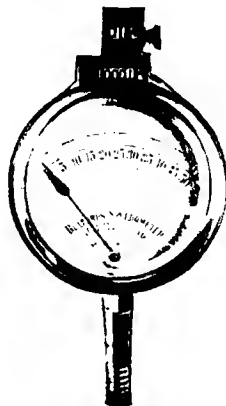
New Form of Shock Absorber.—Whether they are called shock absorbers, suspensions, anti-jolts, or anything else, the benefits derived from some form of spring check between the body and axle of the automobile are undoubted, and, as a result, these appliances are being improved constantly and new forms are making appearance.

The accompanying illustration shows a new arrangement combining both springs and friction disks. Frictional re-

plunger moving up and down in the casing after the manner of a piston, while the rod works through a guide like a piston rod. Above and below the plunger are helical springs, which offer resistance to the movement of the plunger in both directions.

When attached to a car the action of the device is as follows: The springs are of such strength that they allow the car to rise and fall somewhat on its own springs, and consequently the plunger works up and down in its casing, without oscillating the friction disks with relation to each other. This allows the car springs to play as freely as is necessary on smooth roads. When rough roads are encountered, however, the motion of the car springs will be so great as to compress the check springs to such an extent that the friction disks will oscillate upon each other and check the tendency of the car springs to compress or recoil with abnormal violence. All parts of the device, with the exception of the connecting link, the spring steel washer and the helical springs, are of bronze. It is made by the Hercules Auto Specialty Mfg. Co., of Los Angeles, Cal.

Bullard Speedometers.—Nothing to lubricate about it and no adjustments of any kind necessary are two of the important features of the Bullard instruments. They are constructed on the same principles as



the governors used on high-speed engines for electric lighting where uniform speed and steadiness are of vital importance. At the maximum speed the power exerted by the weights amounts to six pounds, thus holding the pointer firm and making the instruments "dead beat" at every division of the scale. Another advantage is the comparatively low speed of the flexible shaft which turns less than twice as fast as the wheel. The complete speedometer comprises a minimum of parts and can be attached to either front wheel by a universal front bracket that fits any car, the wheel gear and flexible shaft also being readily put in place, a simple and effective form of universal joint being employed. It is enclosed in a heavy bronze case and is designed to stand continuous usage, all the moving parts being made of brass or other non-corrosive material, besides which it is made water and dust-proof. The Bullard speedometers are made by J. H. Bullard, Springfield, Mass.

Drop Forged Crankshafts.—"More than forty of the largest motor and motor car builders are using our cranks with entire satisfaction." is a statement that speaks for itself and scarcely calls for comment. It is embodied in a leaflet sent out by the Wyman & Gordon Com-

pany, of Worcester, Mass., and Cleveland, O., illustrating some of the numerous styles of single and multiple throw crankshafts that they have special facilities for turning out in quantities. All stock cranks are made from special steel adapted particularly for the purpose and are subjected to a special process of heat treatment.

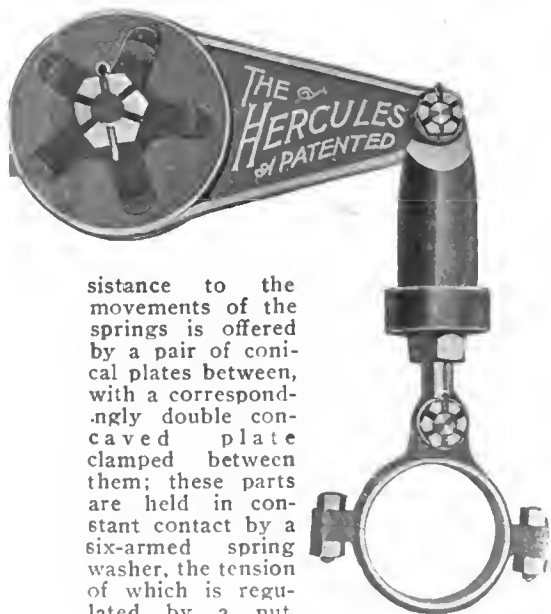
New Detachable Tire Grip.—The makers of the Healy leather tire have just put on the market a new detachable tire grip, made of a very tough, water-proof chrome leather. As will be seen by the accompanying illustration of it.



NEW HEALY DETACHABLE TIRE GRIP.

there are comparatively few cross straps connected at each end to side straps which serve to hold them in place on the tire. These cross straps have steel rivets inserted in them and are fastened to the side straps by a simple and ingenious device which allows any part to be instantly replaced when worn out. Owing to the softness and pliability of the leather bands, the grips do not injure the tire and may be tightened by means of a strap and buckle which makes them silent running. They prevent skidding and do not throw mud on account of their close contact with the tire itself. They are made by the Healy Leather Tire Company, 88-90 Gold street, New York City.

Eagleine "No-Karbon" Cylinder Oil.—If it could be figured out exactly what percentage of trouble is caused by each accessory to the car, there is little, if any, doubt that prominent at the head of the list would come the item of "poor lubricating oil" as a prolific source of worryment. Here, if nowhere else on the car, should be penny wise and pound foolish policy that would skimp by saving a few cents per gallon on lubricating oil be repressed, for of few other things can it be said so truly that the very best is none too good. That bugbear of every autoist—soot—is the direct outcome of poor oil and the trouble caused by its accumulation is endless. The Eagle Oil and Supply Company, 104 Broad street, Boston, Mass., claim that in their "No-Carbon" oils they have a cylinder oil which not only has a high lubricating value, but positively will not become deposited in the shape of soot.

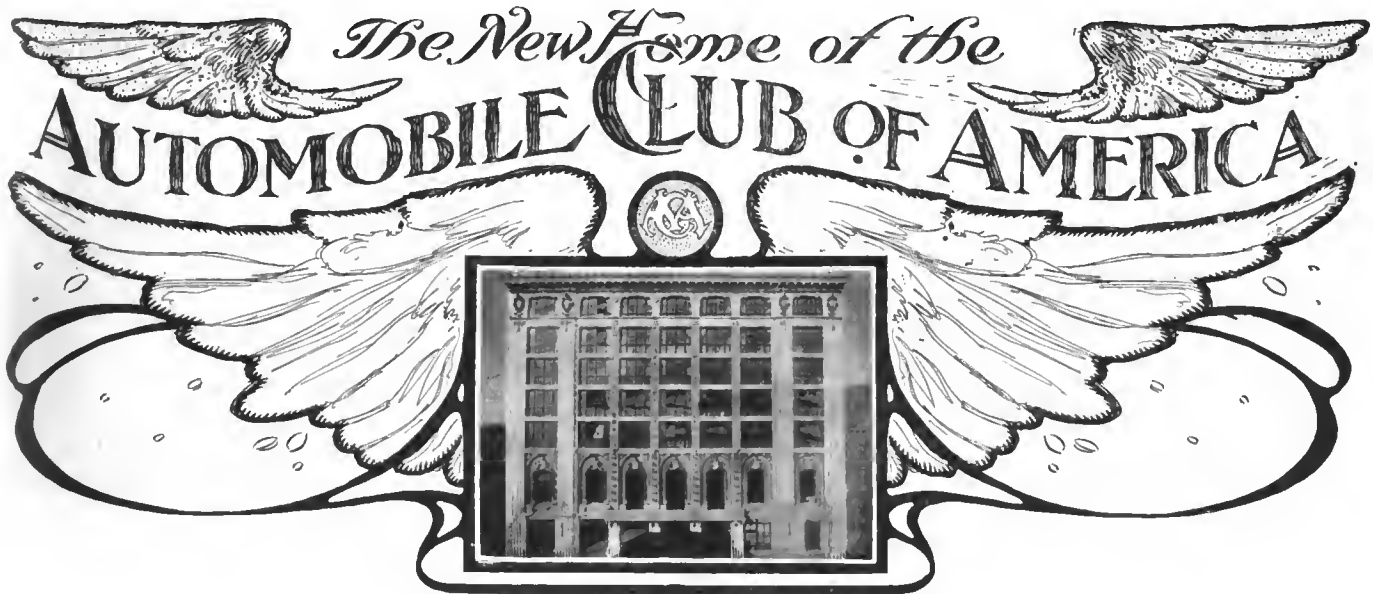


sistance to the movements of the springs is offered by a pair of conical plates between, with a correspondingly double concave plate clamped between them; these parts are held in constant contact by a six-armed spring washer, the tension of which is regulated by a nut.

Wear is automatically taken up by the cones advancing into their recesses in the central plate. The central plate is integral with the lever, and on the opposite end is the spring rigging, as the illustration shows. The friction end of the device is attached to the frame of the car and the opposite end to the axle by means of the clamp on the end of the rod.

The casing is pivoted to the small end of the lever, and inside the casing is a small plunger attached to the rod, the

THE AUTOMOBILE



THOUGH of exceeding interest as a whole, it is doubtless in the elaborate provision made for storing and handling cars that the attention of the autoist and club member will be centered in the new building of the Automobile Club of America, which is located on Fifty-fourth street between Broadway and Eighth avenue, New York City. True, no effort has been spared to make the club and social features prominent, and every facility known to the up-to-date establishment of the kind has been provided, but then there are many elaborate clubhouses in the metropolis, and but one that is at the same time a club and a garage. It is hardly necessary to state that in designing the arrangements for both housing and taking care of the cars nothing was left to chance or experiment. Every system extant prior to the time the building was started was studied and advantage taken of the knowledge gained to avoid errors.

Starting at the ground floor, there is a large entrance for the cars, and a similar exit, at each of which there is stationed a checker who records the movements of every car kept in the building. These two entrances are situated between the members' entrance at the Broadway end and the employees' entrance at the opposite extreme. Passing through the entrance for cars one finds himself in a spacious room with a capacity of 50 to 70 cars and which is intended principally for temporary storage; that is, cars in use which are to go out again shortly. There is a washing stand on this floor, also a turntable facing the two huge electric elevators, so that the cars may be run on the latter according to the direction it is desired they should face when coming off on the upper floors.

The street floor also contains a large members' locker room and the office of the superintendent of the building.

Gasoline and Oil Used on But Two Floors.

Though every portion of the construction of the building is fire-proof, barring the wood trim in the social end of it, neither gasoline nor oil will be handled except on the street floor and the top floor which houses the repair shop. They have been finished with a special hard-glazed material which, beside being fireproof, is also said to absolutely resist oils and gasoline. Fuel storage is provided for in the sidewalk vaults in the shape of a number of small tanks in order to comply with the regulations of the Bureau of Combustibles. They are filled by pipes terminating at the curb line, cars being replenished on the street floor by measuring pumps delivering exactly a gallon per stroke. The elevators, which have a platform measuring 10 by 18 feet, are also floored with same non-absorbent glazed material and have iron sides. Automatically locking gates are provided, the control preventing the gate from being opened except when the elevator is in place and also preventing the latter from starting until the gate is closed.

Four entire floors are devoted to the storage of cars and provision has been made on each for the use of movable iron partitions for those of the club members who wish to keep their cars in locked "stalls." The roof has been designed to bear the weight of a number of cars and the elevators run to this level, so that in case of emergency it can be utilized temporarily for storage purposes. Both the elevators and the



ONE OF THE HUGE ELECTRIC ELEVATORS.



MAIN ENTRANCE TO THE NEW CLUB HOUSE.

stairways are separated from the remainder of the building by a substantial fire wall and automatic metal doors on each floor.

Complete Modern Repair Shop.

As the building is designed to house several hundred cars permanently, it is only natural that most complete facilities for taking care of every kind of repairing have been installed. As already mentioned, the repair shop is located on the top floor, which is entirely given over to it. Here will be placed a complete outfit of electrically driven machine tools, the department being in charge of an expert worker under whose supervision all machine work will be done. This part of the shop is separated from the remainder of the floor by a wire partition. In this open space chauffeurs may dismount and repair their cars, passing all parts requiring machine work through a wicket to the latter department, to which they will not be admitted. To a very large extent the front and rear walls of each floor are composed of fireproof wire glass windows, and this is particularly true of the repair shop, which is lighted by a skylight in addition.

The club's dynamometer will also be installed on this floor with every facility for measuring the output, efficiency and fuel consumption of any make of car, beside conducting other tests of an interesting nature. A great deal of attention has been devoted to this feature by the Technical Committee of the club and it is expected to be of considerable interest not alone to members, but to autoists generally, as it is planned to do considerable testing work here. The building is to have its own lighting service, turbo-generator sets being employed to generate the current with accumulators both as an emergency, as no provision has been made for the use of illuminating gas in the building, and to carry the entire load when not much current is needed.

Construction of the Building.

As will be evident from the photograph illustrating the façade of the building, no attempt has been made at ornamentation above the main or clubroom floor, general utility and adequate lighting having been the aim rather than architectural features. The construction in general is of reinforced concrete, and every effort has been made to render the building fireproof throughout. With a view to preventing the rapid spread of a fire in case it should originate on one of the storage floors, all the columns are provided with hooks from which will depend round-bottomed buckets of sand in addition to the usual chemical fire extinguishers. A number of these columns are also wired to the electric lighting service and have counter-sunk attachment receptacles for the convenient connection of hand lights and flexible cords to render inspection of the cars easy.

The building is eight stories high and the materials used in its construction are marble, Indiana limestone, white brick and terra-cotta, the latter being employed in two colors for the ornamentation over the window arches on the main floor.



COLGATE HOYT,
President of A. C. A.

Social Features Have Not Been Sacrificed.

Though such painstaking attention has been devoted to the housing of the cars and such a tremendous amount of space is given over to them, the purely social end of the club has not been overlooked by any means. The main entrance at the Broadway end of the building opens into a corridor twenty-five feet wide, terminating in a grand staircase leading to the second floor. Under the landing of this stairway is located a ladies' waiting room, lighted by a large dome skylight; it is provided with all conveniences and elaborately furnished. At the head of these stairs is the main assembly room rising through two floors. It is finished in the Renaissance style with a beam ceiling patterned after that of the famous chateau of Cheverney. This room is separated from the grill room, which is capable of seating 300 people, by six sliding doors, so that the two may be thrown together. Adjoining the grill is the governors' room, and beyond that the bar, serving room and kitchen, each of which is fitted with modern appliances throughout. A mezzanine floor accommodates the secretary's office and a billiard room, the remainder of it being given over to garage space. On each of the storage floors there is a special room for chauffeurs. Though the new



MEMBERS' LOCKER ROOM ON GROUND FLOOR.



DIRECTORS' ROOM ON CLUB FLOOR.



TOURING BOARD'S ELABORATE MAP SYSTEM.



ONE OF THE FOUR GARAGE FLOORS WITH THEIR MANY WINDOWS.

club building has actually been in service for the past week or two, it was not formally opened until to-day, the 18th inst.

In view of the tremendous growth of the Automobile Club of America, a brief résumé of its history will be of interest. As the result of a conference between two autoists, Whitney Lyon and George F. Chamberlain, a call for a public meeting at the Waldorf on June 7, 1899, was published generally. The call for the meeting contained the following statement:

"In view of the rapidly increasing number of self-propelled pleasure vehicles in this country and the widespread interest in the subject, and the almost certain use of the automobile as a form of sport in the United States and the difficulty of procuring proper storage and care for the vehicles, it has been thought desirable to call this meeting of owners or intended owners for a conference looking towards the formation of a club."

At this meeting George F. Chamberlain was elected chairman and Capt. Homer W. Hedge secretary. Mr. Lyon briefly ex-

plained the purposes of the meeting and the intense opposition and hostility to the automobile which was being everywhere

shown. There were about thirty present at this meeting. A committee was elected to draft a constitution and by-laws. On August 16, 1899, a charter was procured under New York laws and the club duly incorporated. At the meeting held on October 16, 1899, a constitution and by-laws were adopted, and the following were chosen officers: Acting-president, George F. Chamberlain; treasurer, V. Everitt Macy; secretary, Homer W. Hedge. Official recognition as the national automobile club of America was promptly received from the clubs of Great Britain and France.



SECY BUTLER, TO WHOM THE CLUB OWES MUCH.

Temporary quarters were engaged at the Waldorf and the real work of the club commenced. The purposes and objects of the club are set forth in the charter and are as follows:

The objects of this corporation are the promotion of a social organization or club composed in whole or in part of persons owning



THE MAIN ASSEMBLY HALL, DESIGNED AFTER A FAMOUS FRENCH CHATEAU.



THE LADIES' ROOM UNDER THE STAIRCASE.

self-propelled pleasure vehicles for personal or private use. To afford a means of recording the experience of members and others using motor vehicles or automobiles. To promote original investigation in and development of motor carriages. To co-operate in securing rational legislation and the formation of proper rules and regulations governing the use of automobiles in city and country and to protect the interests of owners and users of automobiles against unjust or unreasonable legislation and to maintain the lawful rights and privileges of owners and users of all self-propelled pleasure vehicles. The encouragement and development in this country of the automobile. To promote and encourage in all ways the construction and maintenance of good roads and the improvement of existing highways, etc.

November 4, 1899, was a famous day in the annals of the club, for then occurred the first public parade of automobiles ever held in the United States. Thousands of spectators blocked Fifth avenue when thirty-four cars, headed by a band, started for Riverside Drive. The line of the route was thronged; the course turned west at 110th street and a few were unable to ascend the grade and dropped out.

The next club run took place January 27, 1900, and was to Kingsland Point, north of Tarrytown. Ten automobiles propelled by steam and three by gasoline made the start; eight in all survived.

The first annual banquet of the club was held at the Waldorf April 2, 1900, about 100 members being present, and addresses were made by Major-General Nelson A. Miles, ex-Mayor W. L. Strong and others.

The first road race promoted by the club took place on Long Island over a course of 50 miles on April 14, 1900. There were ten entries for a cup presented by Leonce Blanchet, of the Automobile Club of France. The race was won by A. L. Riker in a



THE GRILL ROOM, WHICH ACCOMMODATES 300 PEOPLE.

specialty constructed electric in 2:30. The first long-distance race was from New York to Philadelphia, June 2, 1900; 20 cars took part and 16 finished. The start was made from New York at 7:30 A. M., stopping at Princeton, N. J., for lunch; the first car reached Philadelphia at 7:20 P. M., the distance being 117 miles.

Albert R. Shattuck was elected president at the first annual meeting held October 20, 1900, the club then having a membership of 260. The years 1901, 1902 and 1903 were periods of great activity in club affairs. On November 17, 1903, 454 members were enrolled.

The first annual exhibition was held in the Garden on November 3, 1900, with 66 exhibitors, increasing to 176 cars in 1901, 227 in 1903, 258 in 1904, and 290 in 1905, all these shows being held in the same place. In 1906, on January 13, the sixth annual show was held in the 69th Regiment Armory, but as makers were limited to one type of car, only 247 were exhibited.

On September 9, 1901, there was held the first long-endurance run, over a course of 500 miles from New York to Buffalo. Eighty cars started and 44 reached Rochester September 13, when the test was abandoned by reason of the assassination of President McKinley. May 13, 1902, a 100-mile non-stop run was held from New York to Southport, Conn. Fifty-five cars started, 44 finished and 28 made an absolute non-stop run. October 9-15, 1903, a reliability contest was held from New York to Boston and return,

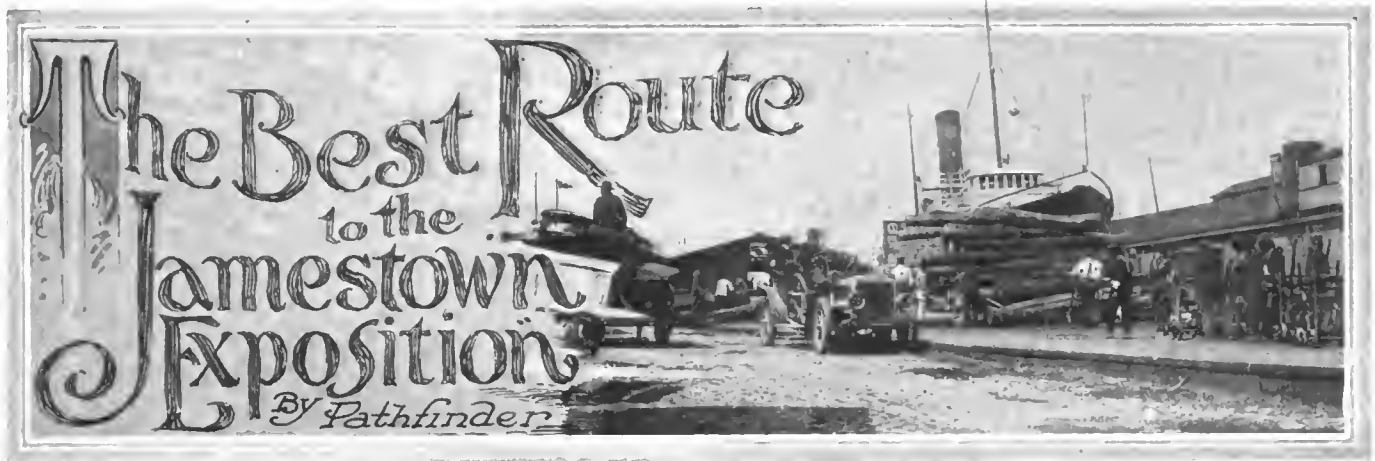


A CORNER OF THE MEMBERS' BILLIARD ROOM.

a distance of 490 miles; 75 cars started October 9 and 68 finished in New York, October 15, within the time limit. May 20-21, 1903, the first commercial vehicle contest took place over 40 miles of city streets. The first day 11 vehicles started and 9 finished; the second 9 started and 7 finished.

On the retirement of Mr. Shattuck in 1903 Winthrop E. Scarrit was unanimously elected; in 1904 the club had 589 members. Dave H. Morris succeeded Mr. Scarrit as president. The club's membership in 1905 was 1,079, and is now over 1,250. In May, 1905, it was resolved to build the clubhouse. The building committee consisted of Colgate Hoyt, chairman; Dr. Schuyler S. Wheeler, and A. R. Shattuck. The land was purchased the same month for \$210,000 and the building cost about \$350,000.

Starting a little more than a year ago, the club established a touring bureau, and after considerable search for a man able to fill the unusual requirements, it was placed in charge of A. L. Westgard, than whom few are better fitted for the post, as he has probably made more road maps than any other man in the country. About \$5,000 was expended in the organization of the bureau, and it is expected that \$5,000 to \$7,000 will be appropriated each year to carry it on. Up to date fifteen special maps have been published, covering New Jersey, Long Island, the Hudson river district, Connecticut, Massachusetts and upper New York State, besides an index to the maps and route cards. Supplementing these, Mr. Westgard has gathered a comprehensive collection of foreign touring maps.



TO the many autoists who are contemplating a visit to the Jamestown Exposition it will be welcome news that there is a practical touring route of but 340 miles between New York and Norfolk. By "practical" I mean not that there is a fine macadam road all the way, but that the route is of such a character that a sturdy touring car should be able to negotiate the trip without difficulty. Recently, while looking into the railroad routes to Norfolk, I noted that by far the shortest was by way of Philadelphia, Wilmington, and Dover, Del., and thence through the "Eastern Shore counties" of Maryland and East Virginia to Cape Charles, from which point the balance of the trip to Norfolk is made by boat. It occurred to me that it would be entirely practical to go this way by automobile, and, finding no information on this route in touring literature, I determined to go and find out. Then I could tell the crowd how to go.

From New York our first day's trip was to Philadelphia, following the beaten touring route by way of Staten Island, New Brunswick, Trenton, and Burlington. Leaving Philadelphia, the next day, by way of South Broad street, we followed the trolley line to Chester over an excellent macadam road which is built over the marshes. From Chester we found a very fair road to Wilmington, Del., the last few miles being over a toll road. Wilmington is twenty-nine miles from Philadelphia, and, throughout this distance, the road skirts quite closely the Delaware River. Leaving Wilmington we were in practically unknown country. We were confident that, whatever might be the condition of the roads, our White steamer would carry us to the destination, but we were by no means sure that the tour would be such that we could recommend it. The event proved, however, that the trip from Philadelphia to Cape Charles may readily be made in three days, and if a man cares more for speed than for scenery this might be reduced to two days. But 'tis better to take time and enjoy yourself.

We had not gone far from Wilmington when we encountered a type of road which prevails the greater part of the route, namely, heavy sand of a kind which does not pack in any kind of weather, no matter how heavy the traffic may be. The farmers' buggies and wagons, all traveling in one track, have worn deep ruts in the roads, but if these are "straddled" the road can be covered at a very fair average speed. The ruts wind aimlessly from one side of the road to the other, and the man at the wheel has his work cut out for him, and, sometimes, 'tis hard, too.

The country is absolutely flat, and yet is by no means monoto-

nous. About twenty miles south of Wilmington we had a genuine scenic surprise, where the road crosses the Chesapeake and Delaware canal. The high banks of the canal rise precipitously from the narrow strip of water which flows lazily on its way from Chesapeake Bay to Delaware Bay. The accompanying photograph better than paragraphs of description conveys an idea of this interesting spot.

We did not need to be told that the automobile was still a novelty all through that region—the action of the horses convinced us that few machines had been there before us. Fortunately, in that part of the country there are practically no fences. The fields are cultivated right up to the edges of the road, just as they are in France. Accordingly, when a horseman would see us approach he would drive off the road into the fields, and, when we had passed, "turn around and drive right back again." We had many such incidents.

Practically all of Delaware is under cultivation, and, as this is the season of the year for plowing and sowing, we saw agricultural activity on every side. Although winter had not yet spent its force in New York, we saw many orchards of peach trees in blossom and the meadows were a verdant green.

When we got south of Dover we encountered a condition which reminded me strongly of some of the Western States. The highway was no longer straight or approximately so, but would occasionally turn east for a mile or so, then abruptly turn south again, and then, for no apparent reason, lead due west for a while. Thus we covered a considerably greater distance than do the crows on their way north and south. In general, we could take our directions from the telegraph wires; but even this guide sometimes failed us, for the wires often leave the main highway to enter some town several miles to the east or the west. Occasional inquiry from the inhabitants is a safe plan.

When approaching Seaford, the largest town in southern Delaware, we came to a 12-mile stretch of shell road. Further south we encountered this same style of road, at intervals which were all too rare, but sufficient to give us an opportunity to learn the advantages of this type of road construction. The shell road is absolutely smooth, drains readily, gives very good traction, and is comparatively dustless. The shell road is very easy to build, and we thought what a world of benefit a vigorous good roads campaign might be for the State. To make a shell road all that is necessary is to dump the shells on the road bed, distribute them evenly



WHERE WATER OVERFLOWED THE ROAD AT CHESTER, PA.



WE STOPPED TO GIVE A GREEN HORSE A LOOK.



YOUNG AMERICA AND SCHOOLHOUSE, LAUREL, DEL.

to the depth of a few inches—and the traffic nicely does the rest.

There is an inexhaustible supply of the raw material for shell roads right at hand. Chesapeake Bay is the natural habitat of the oyster and the vast oyster canning factories, which have long comprised one of the principal industries of the region, turn out the shells by the million as a by-product. We wondered why every mile of road on the peninsula was not covered with shells long ago, until we learned that the shells are in demand to be turned into lime for use as a fertilizer.

We spent the night at Seaford, 115 miles from Philadelphia, and although we fared quite well at the Sussex Hotel there, we later learned that a better schedule, as regards the first night's stopping place, was possible and more convenient.

The next morning we again had a few miles of shell road, but this did not last long, and we were soon plowing through the sand once more. Fifteen miles out we passed near the town of Delmar, which, as the name suggests, is on the border between the States of Delaware and Maryland. Here we buckled on our Maryland license pads, meanwhile breathing a pious prayer that Chairman Terry's national license bill might soon be on the statute books. I should have said before that the motor vehicle law of Delaware permits non-residents to remain in the State for forty-eight hours without undergoing any license formalities. This is a liberal provision which certain other States would do well to copy.

The character of the country changed somewhat as we proceeded down through Maryland, and the road frequently led through woodlands, covered with fine second-growth pine trees. Some lumbering was going on, and we occasionally passed saw-mills. We noted the peculiar style of vehicles for carrying logs—a two-wheeled affair drawn by a pair of oxen and a horse. We could not fathom the reason for this strange combination, al-

though one of our party suggested that the oxen were for power and the horse for speed; in other words, a low-gear and high-gear combination. On reaching the town of Princess Anne at noon-time we were directed to the Hotel Washington, and here we had one of the surprises of our tour. The hotel impressed us favorably from the exterior. It was built in pure Colonial style, yet looked very modern, in striking contrast to the

hotels we had seen en route. We were ushered into a dining-room, every feature of which was prepossessing. Let me enumerate some of the articles on the bill of fare which I remember. Oysters—right out of the bay; fish—ditto; chicken—the kind you read about; asparagus—melt in your mouth, etc., etc. Served by Japanese waiters! And the price 50 cents!! We had to rub our eyes and pinch ourselves to make sure we were not dreaming.

Tearing ourselves reluctantly from this oasis we continued on our way, and after covering fifteen miles of zig-zag roads, such as I have already described, we came to a town having the euphonious title of Pocomoke City. South of this place we crossed into Virginia, and once more had to hang out another license number!

Accomac was the next town of any size, and then we began to think where we should spend the night. We brushed by the hotel at Tasley, and shuddered when we saw the accommodations that Onley had to offer. Finally we deter-

mined to spend the night at Onancock. This place was eighty-four miles from Seaford, where we had spent the previous night, and the reduced mileage for the day probably fairly reflects the less favorable character of the going.

We were glad to leave the hotel at Onancock early in the morning and proceeded southward through the unimportant towns of Keller (where the Standard Oil Company has a supply



CHESAPEAKE AND DELAWARE CANAL.



ANCIENT TOLL GATHERERS AT POST OF DUTY.



A TWO-WHEELER OUTFIT HAD ITS "PICTUR TOOK."



IN OLD VIRGINIA'S WOODED COUNTRY.

station), Belle Haven and Eastville to Cape Charles, which we reached about noon. We had several hours to wait for the boat, which sails at 4:25 P. M., on the arrival of the train from New York and Philadelphia. For carrying our car to Norfolk we were charged the exorbitant rate of \$17.60. I have already taken this matter up with the proper officials, with a fair prospect that a more reasonable rate may be shortly extended.

We found Cape Charles to be 240 miles by road from Philadelphia, and, in the light of our experiences and observations, I would suggest the following schedule: In order to take advantage of the best hotel

accommodations, the first day's trip from Philadelphia should be terminated at Dover, twenty-six miles out. The Hotel Richardson in this city has a good reputation and looks good from the outside, although we did not have any personal experience with the place. The second day's trip is another comparatively short jaunt of seventy-seven miles to the Hotel Washington, Princess Anne, which has already been described. The third day a comparatively early start should be made so as to have ample



AN IMPROMPTU INTERVIEW WITH A FRIEND IN NEED.

time, in case of delays, to reach Cape Charles in time to go aboard the boat. If anyone is in so much of a hurry that he would like to make the trip from Philadelphia in two days, the best stopping place is Salisbury, 136 miles.



CAPE CHARLES, WHERE WE TOOK THE NORFOLK BOAT.



A GYPSY CAMP NEAR NORFOLK, WHERE YOUNGSTERS ABOUND. !

My personal opinion is that those who wish to see the exposition with the greatest comfort should disembark at the intermediate stop at Old Point Comfort (which is but 24 miles from Cape Charles) instead of going through to Norfolk (which is



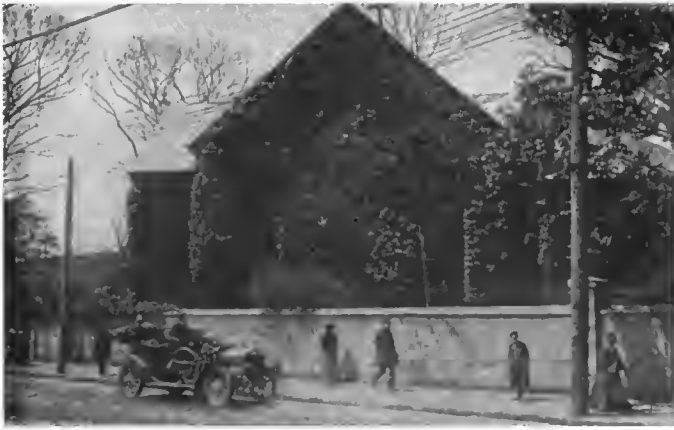
VIRGINIA'S BUILDING AT THE JAMESTOWN EXPOSITION.

36 miles, by boat, from the Cape). The exposition is situated just across Hampton Roads from the point and is nearer to it than it is to Norfolk. One of the most impressive sights in connection with the exposition, in fact, the feature, which will be the most interesting to those who have visited other great expositions, will be the assemblage of warships of all nations which will anchor in Hampton Roads. The "front door" of the exposition, like that of everything else in the vicinity, is on the water front, and most of the visitors will come there by water. There is frequent boat service from the point to all places of interest in the vicinity. The point is a government reservation, and, while there is much military activity at Fortress Monroe, there will be less bustle and confusion in this isolated spot than in Norfolk. The great Hotel Chamberlain on the point is one of the finest resort hotels in the country, but it should be said, however, that the rates charged are fully in proportion to its desirability (plus the price-boosting influence of the exposition).

The vicinity of Norfolk is a better locality for boating than



CINCINNATUS AT HIS SPRINGTIME TASK.



ST. PAUL'S CHURCH, NORFOLK, BUILT BY THE PIONEERS.

for autoing. There are bays, rivers and creeks whichever way you turn, as the soil offers no resistance to the intrusion of water. Consequently, almost all traffic is by boat and the roads receive little attention. The road between Norfolk and the exposition is a disgrace to the community, particularly in view of the fact that there is considerable hauling of material over it to the exposition grounds. We had to use our shovel to get out of one soft spot into which we sank and we also pulled out several wagons that were stuck.

In conclusion, let me say that I believe in the wise old saying "When in Rome, use Roman candles." When around Norfolk do your traveling by boat and save your motoring energies for the trip back home. In a later article I hope to discuss one or more interesting routes of returning north.

NO CLIMB THIS YEAR ON DEAD HORSE HILL.

WORCESTER MASS., April 15.—The Board of Governors of the Worcester Automobile Club announces that there will be no climb this year on Dead Horse hill. It is understood that a premature announcement that the club intended to conduct such an event was called to the attention of Massachusetts Legislature members and resulted in the ultimate killing of a measure under which, if it became a law, the club hoped to secure permission from the State Highway Commissioners. The club was not responsible for the announcement, but under the circumstances it has abandoned the idea of the climb rather than appear as intending to go ahead even if it did not succeed in passing its law.

The recent Stockholm-Gothenburg race was a victim of the weather, as sleet, snow and strong winds combined to create as unpleasant circumstances as possible. Of the thirteen cars starting, only three finished, and of these a Fiat made best time in 39 hours.



ENTRANCE TO FORTRESS MONROE, OLD POINT COMFORT, VA.

MASSACHUSETTS ASSOCIATION HEALTHY.

BOSTON, April 15.—The annual meeting of the Massachusetts State Automobile Association was held at the clubhouse of the Bay State Automobile Association. President E. C. Lee presided, and the reports of the secretary and treasurer showed the association to be making good progress.

Chairman L. R. Speare of the Legislative Committee reported that his committee had been very successful in preventing objectionable legislation, particularly in killing measures intended to lower the speed limit. In regard to the taxation of automobiles, he said that he believed that the committee would report to the Legislature a bill for an annual fee of \$3 for registration.

The Signboard Committee reported that it has secured 1,000 signs, which it proposes to erect along the highways during the coming season. The secretary was instructed to notify the clubs that are members of the association of speed traps, and the Legislative Committee was instructed to have the old and obsolete signs removed, particularly those relating to speed rules.

The election of officers resulted as follows: President, E. C. Lee, Massachusetts Automobile Club; vice-president, John P. Coughlin, Worcester Automobile Club; secretary, James Fortesque, Bay State Automobile Association; treasurer, John C. Kerrison, Bay State Automobile Association; Chairman Legislative Committee, L. R. Speare, Bay State Automobile Association; Chairman Good Roads Committee, John P. Coughlin, Worcester Automobile Club; Membership Committee, W. H. Chase, Leominster; Henry W. Knights, Boston, and A. Burbeck, Brockton.

BOOKS FOR AUTOMOBILISTS.

A Work on Basic Principles.—"Motor Car Principles" is, as its title would lead one to suppose, a setting forth of the principles which underlie the construction of modern automobiles. Roger B. Whitman, the author of the book, and technical director of the New York School of Automobile Engineers, states in his introduction that the object of the book is to explain the principles that underlie automobile construction and operation and to illustrate the movements and mechanical combinations adopted in present-day practice. This is done in some two hundred odd pages with an absence of technicalities, and although the beginner will not by a study of the book learn all there is to be learned about the automobile, he will certainly gain a good deal of useful information. The book is published by D. Appleton & Co.

A Handbook of Practical Value.—The latest addition to the popular type of automobile handbook, "The How and Why of the Automobile," by Fay L. Faurote, fulfills what its author has set himself to achieve, namely to present a plain, easily-understood description of the modern automobile. Assuming that his reader knows nothing about the subject, the author introduces the automobile in as simple and untechnical a manner as possible. The entire field is covered, and covered so completely that the work can be recommended as a handbook for beginners or those with only a limited knowledge of this subject. The book is published by the Motor Talk Publishing Company, Detroit, Mich.

For Automobilists Touring Abroad.—For the convenience of automobilists touring in foreign countries the Bureau of Tours of the Automobile Club of America has compiled and published in book form a large amount of information on ocean freights, customs, rules and regulation in some forty foreign countries. As an example of the nature of the work it is only necessary to quote the arrangement for one country. For France, for instance, ocean freight is given to the different ports, landing charges, and customs are given in detail, registration of machines, driving certificate, road regulations, speed laws, and a list of the French automobile associations likely to be of benefit to the visitor are all dealt with concisely and accurately.

AUTOMOBILE CHANGE GEARS AND THEIR JOURNALS*

By HENRY HESS, MEMBER SOCIETY AUTOMOBILE ENGINEERS.

CHANGE gears are now so generally being mounted on ball bearings that such practice, not only with us, but in Europe as well, may fairly be considered as standard.

Within the past ten years I have had considerable occasion to suggest suitable bearings, very often without being given the necessary data. Questions would take some such shape as: "What bearings shall I use for the change gear of a touring



FIG. 1.—Well-mounted example of American gear.

car?" Requests for the power of the car, its weight, the intended arrangement of the gear were, not as infrequently as a gathering of engineers might think, obviously considered as a prying into affairs that did not concern the bearing makers.

At first sight it would seem a simple matter to take a given arrangement of gears, consider the power transmitted through them, their speed and position relatively to the journals and then, having calculated the load on the journals, pick out suitable bearings.

But—who knows how large a portion of the available maximum power of the engine is employed with any one gear reduction? Who knows for how large a portion of the average load hours the load is carried by a given set? Who knows what the average power exerted is, anyhow? Who knows what the maximum is for a 28-30-horsepower engine that is, however, said to really develop 40 on cylinder diameters for which other builders claim anything between 10 and 50?

Many Important Essentials to Be Considered.

Obviously, the only practicable way out is to reduce to some sort of system the results reached by experience and observation during many years—many, that is, as measured by the history of a lusty infant industry that has cheerfully honk-honked its way to the front rank, not even restrained by false modesty from putting "Gabriel's" horn to an earlier than the intended use.

As a failure to observe a few cardinal principles in mounting ball bearings may readily give unsatisfactory results, even when a suitable size selection has been made, a brief consideration of these principles is first in order. The illustrations given, are, as a rule, typical only, with a few exceptions, which are reproduced from the actual practice of builders who have courteously granted such permission, while others are reproduced from the pages of technical journals.

*Paper read before Society Automobile Engineers at New York.

1. See Fig. 1. One ball bearing only should be employed to a journal. The very natural resort to two or more light bearings to carry a heavier load will not answer. Slight inaccuracies of mounting, deflections of the shaft or housing, temperature effects, etc., will prevent the equalization of load between such multiple bearings, so that at times only one will be called on to do all the work. If it is not equal to that task it will go to pot, and the others will follow. Heavier bearings must be used for heavier loads, not more light bearings.

2. A bearing intended to take radial load should be so mounted that no end thrust may be imposed on it. For that reason either the outer or the inner race should be a slip fit. Were both races drive fits, the one on the shaft and the other in the housing, their seating would have to be by end pressure exerted through the balls, which would probably not be relieved, and so remain to reduce the bearing's radial load capacity, possibly very considerably.

3. The inner race should be a tight, and the outer a slip fit. This holds for all such sizes as are used in automobile work. The reason is that the continuous hammering of the load willpeen down the softer material of the shaft or housing and show this effect more on the shaft. Consider that as between opposing convex and concave surfaces of hammer and anvil the convex surface will be soonest affected. It is the shaft that is convex, and that is softer than the bearing, while the housing seat has the more resisting concave shape and the larger surface.

4. The inner race should be securely clamped between substantial shoulders on the shaft and a nut or its equivalent. This is because experience has shown that, although a drive fit is sufficient to hold the race, an intention to have a drive fit is effective only if translated into practice and only for so long as it is maintained after that. Pulling a bearing off and on a few times, or the reducing effect of the road peening will destroy the fit. But the frictional grip between a sufficient shoulder and a good nut will damp out the road vibrations so that the shaft will not be peened down.

5. When a shaft is to be secured against endwise shifting, whether in one or both directions, that office should be assigned to one bearing only, whose outer race should then be clamped between shoulders in the case. Observance of this rule will benefit the shop, since it is not only difficult, but costly to secure an accurate endwise relationship between shoulders on a shaft and a case. If such relationship is not secured then forcible

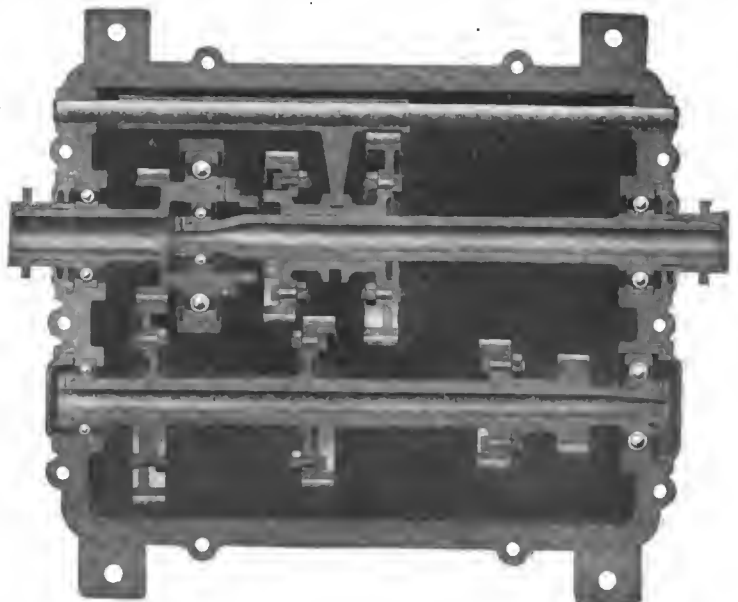


FIG. 2.—Typical illustration of good French practice.



FIG. 3.—A German type designed for 30 H.P. car.

assemblage will introduce un contemplated and destructive end thrusts. The same thing results from a deflection of shaft or housing, as well as from unequal expansion or contraction under the influence of temperature variation.

6. The bearings must be so housed in as to retain lubricant and exclude dust, grit, etc. An impression that ball bearings will operate without lubricant is more general than one might think. It is barely possible that absolutely true spheres might roll on absolutely true surfaces if both were made of materials that were absolutely inelastic and therefore would remain true under load. But since such absolute perfection of shape is not to be had, such possibility is not of interest to the practising engineer, who must, therefore, provide and retain lubricant.

Good Housings an Absolute Necessity.

Since not the wildest stretch of imagination will construe that grit is a lubricant, the necessity of its exclusion is, I should like to say it, apparent enough, were it not for the fact that I have run across mountings so exposing the bearings that grit from trap (or cement) rock-surfaced roads had, together with moisture, formed a cement ring between the inner and outer races, absolutely concealing the balls and binding the two races and the balls into a solid lump.

Fortunately, merely suitable shaping of parts will not only serve to retain lubricant, but also, at the same time, exclude foreign matter.

7. Rust and acid must be kept out. Experience and most carefully conducted tests have proven that long life under load can be realized from ball bearings only when the surfaces are not only true, but are also highly polished and smooth. Roughnesses will be broken down and leave still greater roughnesses. Rust and acid will destroy originally true and smooth surfaces. Since not a few lubricants contain free acids, care in their choice must be exercised. Plentiful lubrication and a properly closed mounting are safeguards against rust.

Fig. 1 is a familiar American gear, and is very well mounted: The inner races are clamped between shoulders and nuts or between shoulders, tubular distance pieces, the hubs (shown partially), or other elements outside the case, that are in turn driven home by nuts (not shown). The outer races are slip fits; those at one end are free endwise, while those at the other end are held between a shoulder in special containers and end cover caps.

The employment of bearing containers is optional. If the case is of rather soft material a container of harder material is advisable. Aluminum alloys are to be had nowadays sufficiently hard to take the bearings directly. Containers are preferred by some designers who wish to use a different lubricant in the bearing from that slushing the gears. Again, some use the containers as a convenient means for adjusting parts in their endwise relationship by simply shifting the containers in the case and with them the shafts, etc.

Fig. 2 is a fairly typical example of good French practice, of a correctly mounted 25-horsepower direct-drive three-speed gear. The end of the driven shaft is ball-journalled in the drive shaft, which is the reason for the rather large bearing carrying the inner end of the drive shaft. Bronze bushes at this point are also frequently used, but their greater wear influences unfavorably the action of the nearer gear pair.

Fig. 3, a German 30-horsepower gear, is, as to mounting, fairly like the preceding one, and employs no containers. A rather smaller bearing for the inner end of the drive shaft is made possible by mounting this farther back, instead of directly over the small bearing inside the clutches. This does not admit quite as good bearing conditions, as the drive gear is overhung, whereas in Fig. 2 this gear is supported between bearings.

Endthrust from bevel gears and bevel pinions may be, and is frequently taken on the same bearings that take the radial loads. Fig. 4 is a case in point. As a matter of course, such bearings are relatively heavier, since one pound of endthrust is the equivalent of from three to four pounds of radial load in its effect on the bearing. The bearing directly behind the differential box, that takes the bevel gear thrust, is therefore considerably larger than that supporting the other end that carries radial load only.

Space considerations sometimes make it undesirable to use a bearing sufficiently large to take both thrust and radial load. In Fig. 5 the bearings directly behind the bevels are, as regards their outer races, free endwise, and therefore receive no thrust. Similar bearings directly behind them are, however, as to their outer races, bound endwise, so taking thrust, but free circum-

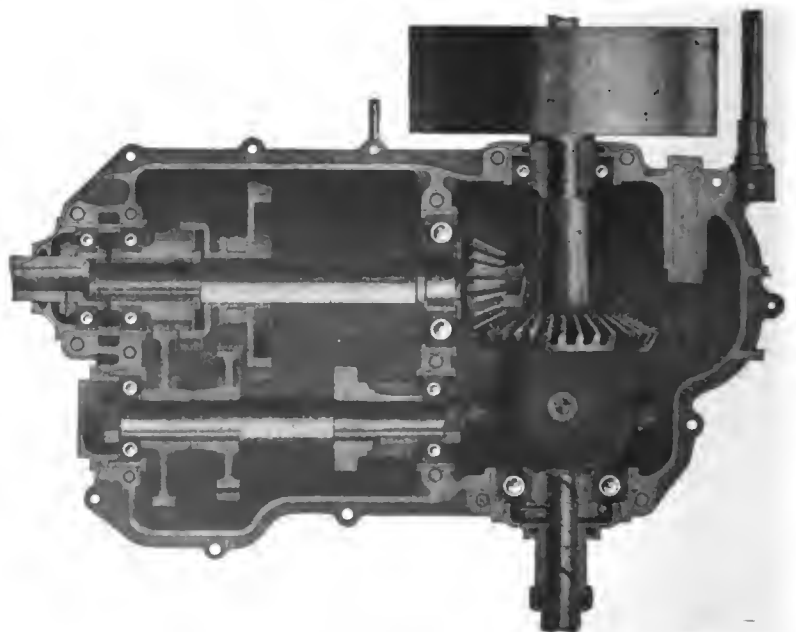


FIG. 4.—Example using same bearing for thrust and radial load.

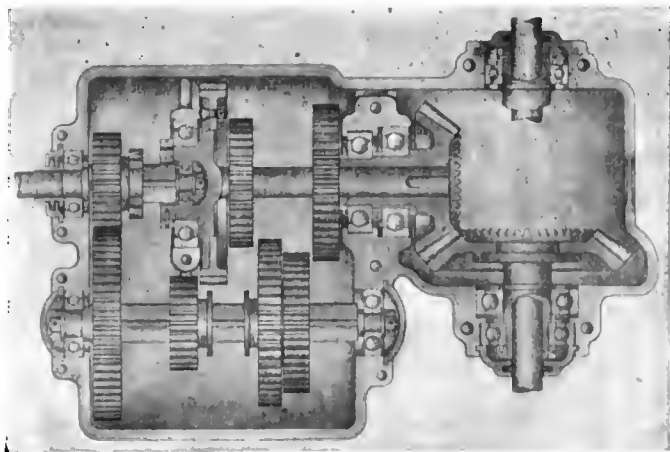


FIG. 5.—Use of separate bearings for thrust and radial loads.

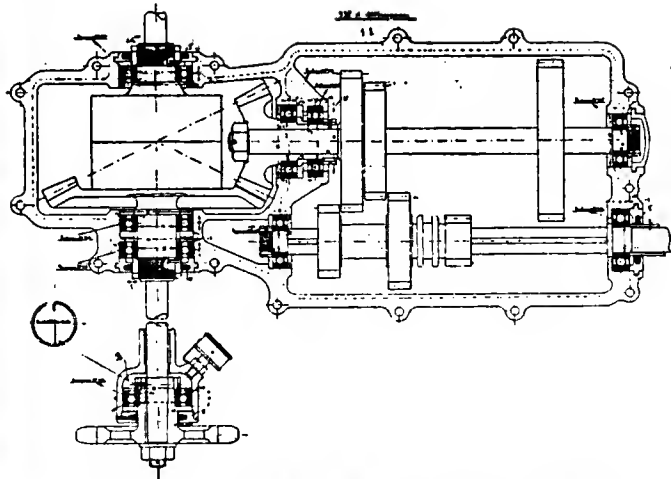


FIG. 6.—French example of separated thrust and radial loading.

ferentially, so that no radial load can be imposed on them. A good example of similarly separated radial and thrust loading from French practice is shown in Fig. 6, while Fig. 7 is taken from English practice. A tendency characteristic of much British engineering is evident in the relatively large parts used. The bearing supporting the inner end of the bevel gear spool is of quite unusual dimensions. That is a fault to which the bearing manufacturer may draw attention as involving unnecessary expense, but which he is hardly likely to seriously oppose.

Many engineers prefer to take the thrust of bevel gears on ball bearings of the collar type—a practice which is certainly good. Fig. 8 is an example. The thrust bearing is mounted directly behind the bevel pinion. Alternative mountings are shown above and below the center line. Above, the spherically faced adjusting surface for the stationary plate is machined directly into the case; below, a concaved washer is employed, as giving rather simpler shop work. Alternative mountings for the differential shaft are also indicated on opposite sides of the center line. In one a smaller thrust bearing can be employed, carrying that on the shaft, as against a larger bearing demanded by the mounting on the bevel gear hub; this last mounting, however, is rather simpler, mechanically.

The various modifications of mountings likely to occur in practice have been fairly covered by those shown, so that I shall now take up the size selection.

Load Data Collated from Numerous Examples.

Since, as has been previously stated, size selection is based on experience rather than on mathematical deductions from insufficient premises, this chapter will be confined to giving in simple diagrammatic form recommendations of suitable bearings for various typical gear arrangements. Obviously, it would

not be proper, since much matter is submitted confidentially for our advice, to give actual practice. The examples are, therefore, taken from résumés of gear arrangements in the *Horseless Age* and other periodicals, and hence of general knowledge. The names given with each example are those given in the publications. In arriving at the loads imposed on the bearings, no attempt has been made to take into consideration change of engine speed with different gear sets in engagement, but bearing size suggestions are all based on an assumed engine speed of 1,000 r. p. m. to develop the horsepower cited. Journal load figures and bearing sizes may, therefore, be modified by direct proportion for other powers or speeds.

(To be continued.)

HOW SIZE MAKES FOR COOL RUNNING.

Given a certain load upon a journal, a certain amount of heat must be generated under certain other conditions, says *The American Machinist*. The heat generated may render the lubricant more fluid. If a bearing be short, the heat generated will be stored in a smaller mass of metal than if the bearing be long, and the temperature will be higher with the shorter bearing, and the more liquid oil will have less supporting power and the bearing may run metal-to-metal, with the further result of more heat generation. Hence a reason for advocating long bearings. It should not be forgotten, in discussing questions of the proportion of bearings, that a long bearing, having larger radiating surface, will part with more heat than a short bearing, so that increase of length acts in two ways: It keeps bearing cooler because it radiates more heat and it better prevents metallic contact because the oil better retains its supporting powers, and the supporting film is more difficult to force out. But neither must it be forgotten that long bearings have their limitations. The oil in a bearing has viscosity or adhesiveness, and length increases the opportunity for the retarding effect of stickiness.

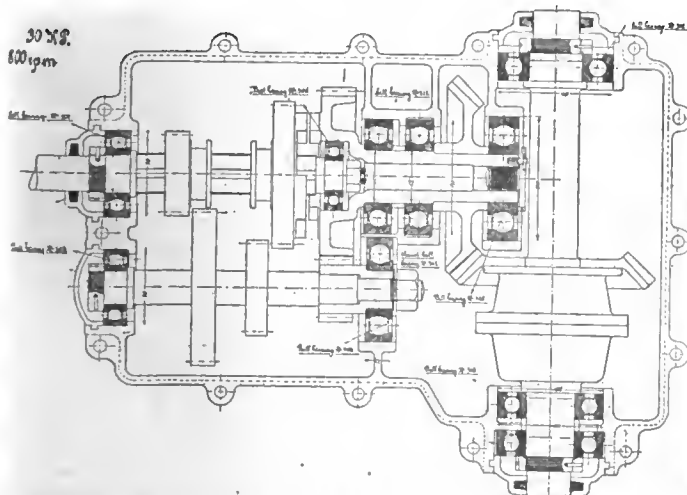


FIG. 7.—English example separate thrust and radial loading.

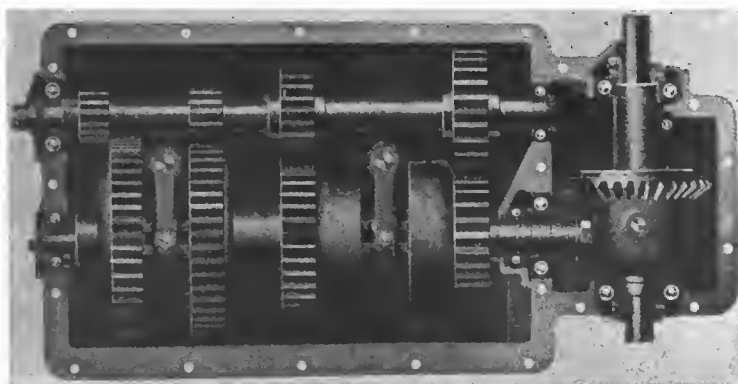


FIG. 8.—Thrust of bevels taken on bearings of collar type.

AUTOS FOR THE HORSELESS AREAS OF THE WORLD

"QUEER Transportation Methods" was the title of a lecture delivered before the National Geographic Society at Washington, D. C., Friday evening, April 12, by O. P. Austin, Chief of the Bureau of Statistics of the Department of Commerce and Labor. The lecturer took his audience through tropical America, Northern Africa, the Holy Land, India, Burma, the Malayan peninsula, the Philippines, China, Korea and Japan, showing by a large number of illustrations the crude methods utilized—the burro of Mexico; the llama of South America; the sledges of tropical Madeira; the saddle ox of central Africa; the camel of the desert; the donkey of North Africa and Arabia; the bullock cart and the dandy of India; the yak of Tibet; the trotting ox of Ceylon; the elephant of Siam; the carabou of the Philippines; the wheelbarrow and sedan chair of Japan; the pack bull and palanquin of Korea, the jinricksha and kago of Japan, and the coolie freight carrier of the Orient.

This problem of the development of the tropics and the Orient, which had been so long delayed by reason, in part at least, of the absence of the horse for transportation between the point of production and the common carrier might now, in Mr. Austin's opinion, be solved by the substitution of the horseless freight carrier of the automobile type for the crude methods which have prevailed in those sections of the world in which the horse is not available and never can be used profitably.

Progress Impossible Without Transport Facilities.

"Of the 100 million horses, more or less, known to exist in the world," he said, "80 million, or four-fifths of the entire number, are found in the temperate zone and nearly all among occidental people, while the remaining 20 millions are largely employed in the service of temperate zone visitors or residents, and are but feeble representatives of that noble animal as he is known to the people of Europe or America." In the United States and Canada we have 1 horse for every 3 1-2 persons approximately; in South America, 1 for every 7; in Mexico, 1 for every 12; in Japan, 1 for every 33; in Turkey, 1 to every 40; in the Philippine Islands, 1 for every 50 (in Africa, 1 for every 150; in India, 1 for every 200), while in southern China, for which no statistics are available, the number is probably even less.

No man who has visited the tropics and the Orient can fail to realize the great disadvantage under which tropical and oriental man has labored in his attempts to develop exploration, intercommunication and exchange of products; and the great benefits to science and commerce which would come from a satisfactory device which would do for the tropics and the Orient what the horse has done for the temperate zone of the occident. Clearly the conditions of transportation in the tropics and the Orient are due, in part at least, to the absence of the horse. Now comes the final question, of whether the ingenuity of man may provide a substitute for the horse, which can be utilized in those areas where the horse cannot exist. This may now be answered in the affirmative. For many years man has been experimenting in attempts to transport merchandise and men by some machine which carries within itself its own propelling power. He soon learned that he could drive a wheeled vehicle on land by power produced within itself, provided he supplied it with an iron or steel track on which its wheels might run; and with this knowledge the railroads spread over all that part of the world where horses could be found to bring the products to their stations.

Coming of the Passenger and Freight Automobile.

But until the beginning of the twentieth century man had not solved the problem of operating self-propelled vehicles on ordinary dirt roads or across stretches of country in which no roads exist. That art has at last been attained. The introduction of the bicycle brought the rubber tire and the application of the rubber tire brought a self-propelled vehicle which could be oper-

ated on country roads, the automobile. Then came the development of the freight motor, the self-propelling vehicle which would carry heavy loads of merchandise over the ordinary highways; and to-day thousands of horseless vehicles are moving hundreds of thousands of tons of merchandise over roads of a type which can be supplied everywhere.

Automobile Freighters Invading Every Land.

The practicability of applying the self-propelling vehicle to transportation in deserts, in the tropics and the Orient has already suggested itself, and the experiments made have already assured success. In the deserts of New Mexico and Arizona motors are successfully working at temperatures of from 120 to 140, where horses or mules can only be used at night. In Nevada motor trucks are now performing the work of thirty horses each, carrying freights over 100 miles of mountain roads. In California motor cars are carrying over dirt roads in the mountain regions as much ore at each trip as would require 100 pack horses. In Puerto Rico a line of three motor vehicles carries passengers and mails, performing the work of more than a score of vehicles and over 100 horses. Numbers of American motor vehicles have been put on the roads of Cuba and Santo Domingo with success, and more are being ordered. In Honduras American motor trucks are conveying minerals to the seaboard from the mines 100 miles inland, a single automobile truck doing the work of 100 mules. In South America the horseless vehicle is carrying passengers and freights to inland cities at an enormous saving of time and expense. In Egypt the freight and passenger motor is beginning to take the place of the camel, and roads for their use are being constructed through the desert on which the product of the emerald mines will be brought to market. In Turkey motor cars are making regular trips over country roads carrying both freight and passengers. U. S. Consul Michael reports that the Indian Government is considering the desirability of utilizing motor transport wagons for moving the products of the outlying districts. Special Agent Crist reports a rapidly increasing use of the automobile in South Africa, especially in the mining regions; that nearly a million dollars' worth of these vehicles were imported in 1906, and that the cost of constructing motor roads is only about one-eighth as much as that of railways. In the Congo the Belgian Government is constructing hundreds of miles of roads for the use of the motor in the transportation of freights in that section. In Java an American automobile is being used for the transportation of mails over the country roads of that island. In Japan experiments with the motor car have been so successful that a company has recently been organized in that country with a capital of 10 million yen for the purpose of building and operating vehicles for a general transportation service in Tokyo and thence to the surrounding towns. In the Philippines a line of motors is being put on to carry passengers pending the completion of the railway. A special type of vehicle made in Paris has now trains of horseless freight and passenger trucks operating over country roads in the continent as well as in Algeria, Central Africa, Chile and Peru. Finally, so confident are those acquainted with the horseless vehicle and its ability to operate in the tropics and the Orient that a race of motor vehicles from Peking, China, to Paris, France, a distance of 9,000 miles across the great Gobi desert, is planned for next June.

HOW TO FILL CAST-IRON BLOW HOLES.

Holes in cast iron may be filled by the following alloy: Melt together nine parts of lead, two parts of antimony, and one part of bismuth, and pour this mixture into the hole, first somewhat warming the hole, says the *Mechanical World*. This alloy possesses the quality of expanding when cooling, hence becomes solid in the holes when cold.

LETTERS INTERESTING AND INSTRUCTIVE

The Question of Steel versus Castiron Pistons.

Editor THE AUTOMOBILE:

[704.]—In an experimental automobile I am about to build, I wish to use steel cylinders, probably in connection with steel pistons, for the sake of securing a maximum of strength and lightness, but I do not feel altogether safe in disregarding the general condemnation of steel cylinders which seems to exist in the comment of all who have tried them. Nevertheless, it is my opinion that there are enough mechanisms in which steel-to-steel bearing surfaces are used with good results to indicate fault in the application rather than in the principle of using steel for this purpose. What, in detail, if you will please tell me, are the troubles actually found with steel cylinders? Do they seize, wear too rapidly, warp—or what? I fully understand that ordinary cylinder iron is believed to contain enough free graphitic carbon to act as a lubricant, but the value of this cannot be very great because cast-iron-to-castiron quickly seizes when run dry, showing that chief dependence must be placed on the lubricating oil, after all. And why is not a castiron piston all right in a steel cylinder?

Lakewood, N. J.

E. H. HOUSMAN.

The question you raise undoubtedly is in a considerable degree an open question, still subject to settlement as automobile building advances, though to-day the general practice of the industry is overwhelmingly in favor of castiron and against steel cylinders. Steel cylinders tend to seize, principally, no matter how well their lubrication is looked after, but it is a fact, bearing out what you say, that there are occasional instances found of their successful use. It probably is not so much the free graphite in castiron that gives it its value as it is the presence of minute pores which trap globules of oil (becoming oil-soaked, as it were) and thus facilitate lubrication. Castiron to steel does work better than steel to steel. Once seizing commences, it produces rapid wear and overheating, but these seem thus definitely to be effect rather than cause. In attempting to use steel, too close a fit should not be attempted, or differences in size due to variations in temperature may aggravate the troubles that are difficult to avoid at best. In the Christie car, which is the American entrant in the coming Grand Prix, and which was described in last week's issue of THE AUTOMOBILE, pistons and cylinders are of steel, but the two are absolutely prevented from coming in contact by the ingenious expedient of casting two broad bronze bearing rings directly into grooves turned in the surfaces of each piston. This engine has seen some hard service and has given no trouble whatever. A suggestive fact, because of its bearing on this problem, is the little-appreciated quality of hardened steel to hardened steel for shaft bearings, this combination being widely used by conservative engineers of standing for the heaviest and most exacting services—provided the conditions are such that complete and unflinching lubrication is absolutely assured. Otherwise its use is not even to be considered.

Two-Cycle Engine Dimensions.

Editor THE AUTOMOBILE:

[705.]—Will you please publish the full dimensions of a good two-cycle gasoline engine? SUBSCRIBER.

Chicago, Ill.

There is so little unanimity among even the best qualified designers as to what proportions are most satisfactory for two-cycle engines, that it is difficult to give you figures which will be in no way beyond criticism. Probably the following come about as near as is possible to an average of the best current practice: Bore, 4 1-4 inches; stroke, 4 inches; exhaust port, 3-8 inch deep and 3 inches wide; bypass port, 1-2 inch deep and 3 inches wide; intake port (assuming that you have in mind a three-port engine), 1-2 inch deep and 3 inches wide; deflector straight, and one inch high; connecting rod, 8 inches long; piston pin, 1 inch in diameter; crankpin and crankshaft, 1 1-2 inches in diameter; cylinder walls, 1-4 inch thick; water jacket space, 5-8 inch, and piston length, 6 inches. In a two-port engine a 2 1-2-inch flat poppet valve with a 1-8-inch lift will serve in place of the intake port.

How to Connect Up an Apple Ignition Set.

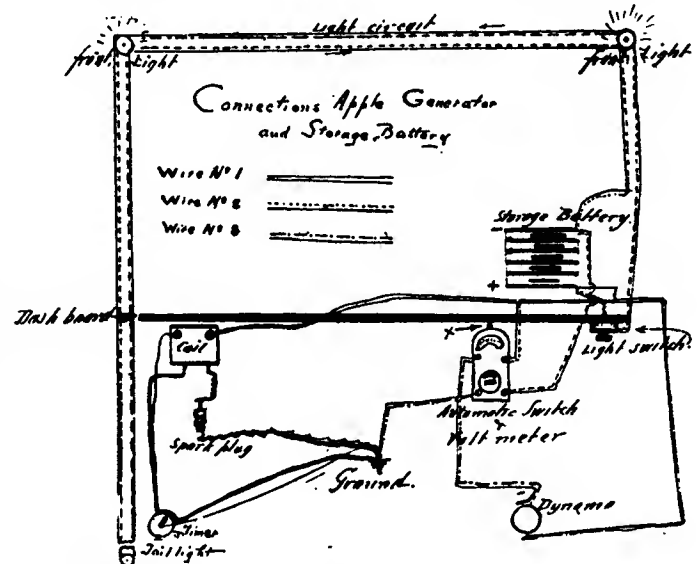
Editor THE AUTOMOBILE:

[706.]—Will you please let me know through "Letters Interesting and Instructive" if the connections of my dynamo and storage battery are correct, as per sketch enclosed? You will notice that the connections are the same as illustrated in No. 10, March 7th, of "The Automobile." Now, having established the wiring as shown, I turned the switch on and started the machine. Do not know exactly on what section the switch was, I presume it was in amp. charging, when, after a while, I saw smoke going out from the voltmeter, and before I could stop the current the voltmeter was completely burnt and out of service. I looked all over the system to see if there was a short circuit somewhere, but could not find it, and saw everything properly adjusted as per sketch.

The only apparent cause (to my understanding) of the overheating and burning of the system seems to be the different kinds and diameters of the wires: wire No. 1 being double insulated thick for secondary work; No. 2 common lamp cord half the size of No. 1, and No. 3 also cord of half the size of No. 2. Have also noticed that my "Apple dynamo" heats; after running an hour or two it scarcely can be touched with the hand.

The storage battery is a 6-volt 60 ampere-hour system. I beg to ask you the following questions:

1.—What was the cause of the burning of the voltmeter, and how can I prevent it?



SKETCH OF IGNITION AND LIGHTING CONNECTIONS.

2.—In the spot marked by an arrow is a hollow nut where an electric cord or wire may be inserted, such wire or cord was lost en route, and the instrument came to my hands without it. Is it necessary and how used?

3.—Will the different diameters of wire have a bad influence upon the current and determine the overheating of the conductors? If so, what kind or size of wire or cord must be used?

As I am a subscriber to "The Automobile," will you kindly answer these questions, and believe me yours truly,
San Luis Potosi, Mexico.

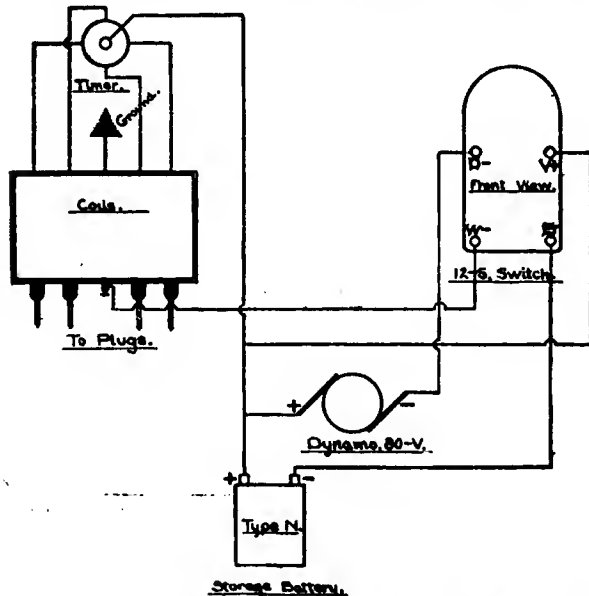
STRANGER, L. B.

1.—The cause of the voltmeter burning out, as you describe in your letter, was evidently due to an internal ground, or short circuit, against which you could naturally not guard, unless, as many autoists and people generally, for that matter, have a habit of doing, you took the instrument apart "to see the wheels go round" and did not get it together again properly. The makers of the apparatus, to whom we have referred your letter, assure us that the wiring is correct if connected up in accordance with the diagram you submit. The different sizes of wire used would have no bearing on the matter, i.e., the overheating, provided connections were all well made and wire of reasonable current-carrying capacity were used.

2.—The makers inform us that the hole in the top of the meter is not for the insertion of a cord, as you surmise. It was origi-

nally placed there for the purpose of accommodating a small push-button, by means of which the voltmeter could be bridged across the line in order to obtain a reading. It has been displaced by the snap-switch on instruments of more recent make and is no longer in evidence on the latter.

3.—As already mentioned, the different sizes of the wire used would not influence the action of the apparatus one way or the other, unless wire of such small cross section were employed



WIRING DIAGRAM OF APPLE DYNAMO AND ACCUMULATORS

that the amount of current used would tend to overheat it. Nothing smaller than 18 B. & S. gauge copper wire should be used, and the makers recommend Packard primary cable for the low-tension wiring, this being a built-up or flexible cable, which is the equivalent of about 16 gauge.

Regarding the overheating of the generator itself, it is equally possible that this may be due to purely mechanical reasons, such as lack of oil on the bearings, as that it is suffering from some electrical defect. Or, again, you may be running it at an excessive speed, thus putting a considerable overload on it, which would soon cause overheating. The makers have sent us a sketch, showing the proper connections, which we are reproducing together with your own, and they advise us further to have you return the burnt-out switch panel directly to them.

Horsepower and Other Things in General.

Editor THE AUTOMOBILE:

[707].—Will you kindly give me a little information through "Letters Interesting and Instructive" regarding the horsepower of an automobile I am about to purchase. What I wish to know is what is the normal horsepower at say 900 revolutions per minute. Also, maximum horsepower, full speed of motor being about 1,600 revolutions per minute. Also, please state about what speed car could make on an ordinary good road. Following specifications will give data on which answers to the above can be based: Run-about body; weight (entire car), 1,300 pounds; wheelbase, 80 inches; tires, 28 inches by 3 inches; tread, 56 inches; double-opposed four-cycle motor, water-cooled, $4\frac{1}{4}$ -inch bore by $4\frac{1}{2}$ -inch stroke; valves, mechanically operated; jump-spark ignition; car is single-chain driven of heavy Brampton type and is geared about 4 to 1. Springs and axles are extra heavy type. I wish to have a light tonneau made for this car, making it a light touring car. Would you deem this advisable?
A. SUBSCRIBER.

Cleveland, O.

Asking us to tell you the horsepower of your motor with the data supplied by your letter, is, we fear, somewhat overrating the omniscience of the editor. There are other considerations and somewhat important ones, by the way, such as the compression, for instance, on which your letter is silent. But even if you had given us all the data necessary to figure the horsepower, we fear very much that it would not agree with the

maker's rating. Probably you can recall the state of affairs that prevailed a few years ago in this country, when the ratings of a number of motors that differed so little in detail as to be hardly distinguishable apart, were so much at variance that one scarcely knew what to believe, and the sarcasms "catalogue" horsepower, "dream" power, "motor" power, and a few others of the kind sprang into current use. This was particularly the case with the double-opposed horizontal type of motor, some of which were rated all the way from 12 to over 20 horsepower on practically the same dimensions. Assuming the compression of your motor to be about 60 pounds per square inch, we should say that it ought to develop about 10 horsepower at 900 r.p.m., and probably 12 to 15 at 1,600 r.p.m., but if it is designed to deliver its rated output at the former speed, should not recommend running it at the latter figure. As the weight of the car is well proportioned to its power, it should probably be able to run as high as 30 miles an hour under favorable conditions on the level, but with such small wheels, we have no doubt you will find 25 miles an hour about as fast as you can go with comfort on any but the smoothest of roads. We should recommend the use of at least 30- by $3\frac{1}{2}$ -inch wheels and tires, this being the size specified by all American tire makers for a weight of 450 pounds per wheel, which your car will probably exceed with four passengers up. It would not be advisable to put a tonneau on without increasing the size of the tires as indicated, the result being endless tire trouble otherwise.

Omitted in Answering Letter Number 703.

In publishing letter number 703, from F. P. Covert, Hovington, Kas., which appeared in the last issue of THE AUTOMOBILE, the fact that it called for an answer was inadvertently overlooked. It contained the following question: "How much loss of power would there be in compressing air in a receiver and using it in a simple engine such as is used with steam?"

This would depend to a very large extent on the purpose for which the power was to be used, how far the engine was to be located from the air-compressor, and a number of other factors, but generally speaking, the efficiency is rather low. There are several sources of loss: first, the air-compressor itself, the efficiency of which would probably be 80 to 85 per cent.; second, loss occasioned by pumping the warm air of an engine-room in the case of a stationary plant, which, of course, would not be present if you refer to its use on an automobile; fourth, friction in the conducting pipes, this being excessive if the pipe is very long, as in the case cited by an engineer of a water-power air-compressor plant transmitting its power three miles to mining machinery through a 24-inch main; but 390 horsepower was delivered of 1,430 generated at the falls. In an extensive system of compressed-air distribution service used in Paris some years ago, it was found impossible to make a commercial success of it, unless the air were heated prior to use. It is also very difficult to entirely prevent losses from leaks. Experiments extending over a number of years have been made in this country with street cars using just such a system as you mention, *i.e.*, air compressed in receivers and expanded in double-acting engines similar to those used with steam. That they were finally discarded as commercially impracticable after long experiment and investigation would appear to conclusively demonstrate that the losses are excessive.

Editor THE AUTOMOBILE:

[708].—I remember seeing some formulæ for aluminum solders printed in "The Automobile" two or three months ago—I think it was one of the January issues, and would like to know if I can obtain a copy of that number. I am already a subscriber, but would like to get another copy of that issue.
R. W. SHEARER.
Chicago, Ill.

We recall the fact that the formulæ you refer to were printed in THE AUTOMOBILE around the time you mention, but are under the impression that the issue was one of the special show numbers, which are out of print. We are accordingly repeating the same formulæ herewith for your benefit. One part aluminum;

one part 10 per cent. phosphor tin; 8 parts zinc and 32 parts tin, all by weight. This is said to make an easy flowing solder with which Canada balsam is used as a flux. Another formula is composed as follows: 80 parts tin, 20 parts zinc, using a flux made of 80 parts stearic acid, 10 parts chloride of zinc, and 10 parts chloride of tin. Pure tin fusing at 250° Centigrade has also been used as solder for aluminum. The use of chloride of silver as a flux has been patented and is said to give good results with ordinary soft solder. The difficulty in soldering is said to result from its extremely high heat conductivity, which withdraws the heat of the molten solder so rapidly that it "freezes" before it has time to flow sufficiently. A pure nickel soldering bit is used where it is desired not to discolor the aluminum, this resulting from the use of a copper bit. The fact that aluminum oxidizes instantly the moment a fresh surface is exposed also renders soldering difficult.

Wiring Connections for an Automatic Cut-out.

Editor THE AUTOMOBILE:

[709.]—How should an automobile cutout be wired? What size wire and how many turns in the coil, say for a dynamo of 15 v. 3 amp. output?

Will a series wound dynamo deliver current through a coil bridged across it, or should the automatic cutout be wired in series with the storage battery from the dynamo?

What prevents the storage battery remagnetizing the coils of the cutout when the dynamo stops? Should the tension spring in the cutout be strong enough to hold anything less than 6 v. for a 6 v. accumulator and release and close the circuits when the current reaches above that point? J. W. SMITH.

Chillicothe, Ill.

(1) The connections to the cut-out will depend more or less on the wiring of the remainder of the system; if the dynamo is only to be employed in charging the accumulators, the current from the latter being used for ignition at all times, then the cut-out should be wired in series with the generator so that upon coming into action it throws itself into shunt or across the line, and connects the storage cells in series with the generator.

(2) As by cut-out, we presume you mean simply an under-load circuit-breaker, the number of ampere turns required on it will be determined by the maximum amperes of the charge and the amount of magneto-motive force needed to actuate its armature, so that the amount of wire needed will depend largely upon the rest of the design.

(3) A shunt-wound dynamo should be used for charging and the cut-out wired in the circuit as already mentioned.

(4) When the current drops below a determined minimum the spring of the cut-out which always tends to break the contact against the magnetic force generated by the current, pulls the armature away and severs the connection, both between the dynamo and the accumulators and between the latter and itself. When the cut-out is not in action, there is no connection between it and the accumulators, but only to the dynamo, so that the generation of a current by the latter serves to operate it.

(5) As a three-cell battery reaches 7.5 volts or slightly in excess of this while on charge, the circuit-breaker should become operative at anything less in order to prevent the battery discharging through the source of the current in case its voltage should exceed that of the latter.

Information Wanted Regarding the Brush Runabout.

Editor THE AUTOMOBILE:

[710.]—Will you kindly inform me if, in your opinion, the Brush runabout is all the makers claim for it?

Also, is it good practise to place the whole plant of an automobile directly on the frames and axles? I believe the Brush car is so constructed, there being no springs to absorb the road shocks that naturally would be transmitted to the motor and machinery. Hartford, Conn.

W. C. WILLSON.

While we aim in this department to be of as great assistance as possible to our subscribers in all matters pertaining to automobiling, it should be apparent to you on a moment's considera-

tion that you are asking a manifest impossibility in the present instance. To reverse things, it would be as appropriate for you to ask the manufacturers of the Brush runabout if THE AUTOMOBILE were all its publishers claim it to be.

Regarding the latter part of your letter, we must also inform you that it is not the province of this department to criticize current designs, particularly as represented by new cars that have not yet undergone the test of time in a number of owners' hands. All we can say is, that the car in question is the work of a well-known designer, and was presumably not uncovered before having been put to a very thorough trying-out behind the scenes, as is the case with every engineering work. It is not customary in this or any other field of engineering endeavor to rush untried and untested machines on the market. Some makers of automobiles attempted to do so in earlier days, but soon were brought to a realization of the futility of such a plan. Your impression that there are no springs whatever to absorb the road shocks and prevent them being transmitted directly to the motor is quite erroneous, as you will note at a glance in the illustration of the car published in THE AUTOMOBILE some time since. If you wish to inform yourself regarding the car as a prospective purchase, we have no doubt that the makers will give you any reasonable form of demonstration to substantiate their claims for it.

Another Subscriber Who Thinks Well of This Department.

Editor THE AUTOMOBILE:

[711.]—In your issue of March 28, a subscriber writes that he finds "Letters Interesting and Instructive" worth the price of a year's subscription. I agree with him. Such information comes from owners of cars and not from dealers. In one of your issues of February you answered some questions of mine. Parts of my questions and your reply have been referred to several times by other correspondents.

I wish to say that your suggestions as to cause of my trouble I found to be correct; camshaft on inlet side was considerably out of where it should mesh with crankshaft. As there were plain punch marks on camshaft gear and on crankshaft, it was quite easy to adjust (that is, after one knew). Also, I found that another man to whom I had taken car had tried to fix it by advancing timer. He had advanced it so far that spark came just as exhaust valves opened. I am now overhauling this car myself, replacing some sprockets, cones, and balls, and I think the car will run as well as ever.

In your issue of March 28, a subscriber asks as to direct current from dynamo to coil. Perhaps my experience may interest him. During the Boston show of 1906 I saw and asked a lot of questions of the representative of the Dayton Electrical Company. I bought one of their outfits, battery charger, storage battery, autometer cutout; had full directions as to putting same in my car and carefully followed them. Starting engine from dry cells, charger seemed to run all right; when I switched from dry cells to Dayton outfit, engine stopped, I seemed to get current from charger to autometer and out on dashboard of car, but there it stopped. Ran car to a garage and they tried it with same results. They then tried wiring direct from charger to coil, started engine from dry cells and switched to charger, engine raced and a stream of sparks flew from vibrator on coil. Testing voltage showed 15 volts. While this lasted but a few seconds it cost me considerable to have coil repaired. I then returned outfit to makers and they sent me a full new outfit, all parts tagged as to wiring. I have never tried this second outfit and have it just as received. I think I could use it if I could regulate the charger and cutout (not using the storage battery) so that charger would not give over six volts at coil.

As I own two cars, one a four-cylinder air-cooled gasoline, and the other a White steamer, and as I take entire care of both, I have quite a variety of parts to look after.

Dunbarton, N. H.

C. F. M. STARK.

Even the editor likes a bit of taffy now and again, so that we are pleased to learn that our suggestions happened to hit the mark in your case and proved of actual assistance. It is rather more of a rarity to be complimented on having been right than to be taken to task for being wrong, though we note that some of our worst accusers fail to respond with a bill of particulars when we plead to the indictment and ask for further details of the error. However, the value of this department does not lie so much in the assistance that the editor can give the subscriber as it does in the fact that it constitutes a practical clearing house

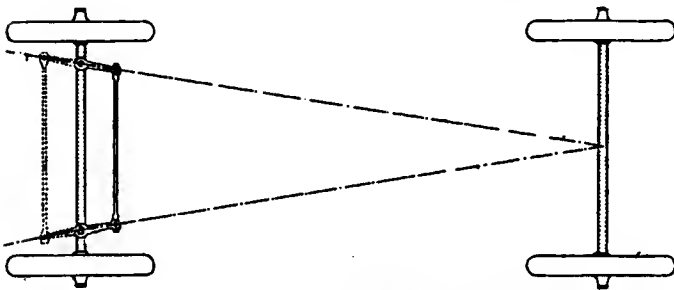
for the interchange of actual experiences in taking care of cars and in overcoming difficulties, between thousands of subscribers in different parts of the country, and we have no doubt that there are many autoists who will agree with you and the writer you refer to, that this is a privilege well worth the price of a year's subscription. We are always pleased to be of assistance, if possible, when you are in trouble, or to convey your suggestions of a remedy for some other subscriber's trouble, through the columns of THE AUTOMOBILE.

Regarding the matter of the Apple dynamo and charging set, your letter is opportune, as you will note by the answer given to Stranger L. B., San Luis Potosi, Mexico, which you will find in this issue. The maker's wiring diagram, reproduced herewith, should be of assistance in installing the system in question, but if not we will be glad to help you out further.

Laying Out Steering-Pivot Arms.

Editor THE AUTOMOBILE:

[712.]—Being a subscriber to "The Automobile," I have taken much pleasure in reading your "Letters Interesting and Instructive." Since your inquirers receive such interesting information, I am taking the liberty of asking you for a little information. Will you kindly tell me what formula is used in calculating the angle made by lines through the center of the steering pivots and the steering-pivot-arm ends with the line connecting these two ends? I understand that this angle decreases with either an



METHOD LAYING OUT ANGLE OF STEERING KNUCKLES.

increase of wheelbase or tread, but I do not know in what proportion. In order to keep the forward wheels from binding on their bearings when turning a corner, this angle should be exact and I would be pleased if you would give me a formula taking into account the wheelbase and tread combined.

Otto, N. Y.

DAVID L. BROWN.

A rule widely followed is to have the steering-pivot arms in position for straight-ahead travel lie along lines drawn from the centers of the steering-pivots to the center of the rear axle. This, of course, applies only to rearwardly-extended pivot arms, used in connection with a drag link behind the front axle. With the drag link in front of the axle, the pivot arms may be practically in registry with the forward prolongations of the lines mentioned. There is no hard and fast rule invariably followed, however, in the laying out of steering gears—each designer usually having his individual preferences, which will be found applied in the constructions for which he is responsible. It is not possible—without most objectionably-complicated linkages—to produce a steering gear serving the same ends as the accepted type, which shall function correctly at all angles of turning. One or both wheels are bound to be at slight angles to their direction of travel in at least some positions. Consequently, there is afforded a choice between the policy of distributing the unavoidable error as nearly as may be through all angles, and that of minimizing it in the more nearly straight-ahead positions at the expense of the less-utilized wider angles of turning. Theoretically, lines drawn through the axes of all the vehicle wheels should meet at the center of the circle about which the car is driven. With this fact in mind, a few moments of work with paper and drawing instruments will quickly demonstrate an abstrusity which, it must be admitted, the problem does not appear to possess upon a casual consideration; hence, the method referred to above.

The Early Benz Engines.

Editor THE AUTOMOBILE:

[713.]—If you will be so good as to tell us, through the correspondence pages of "The Automobile," whether the old Benz cars, made in Germany, were propelled by two-cycle or by four-cycle engines, you will settle an argument that is causing myself and two friends some agitation. My friends, one of whom declares he drove an old belt-driven Benz, insists it had a four-cycle engine. I, on the other hand, have a distinct recollection of reading that these cars were driven by two-cycle motors—making the use of the two-cycle principle by Benz antedate the work of Clerk, who is commonly regarded as the inventor of the two-cycle engine. Hartford, Conn.

AN OLD TIMER.

The first patent issued to Benz and Company bears the date of March 26, 1884, and was for a two-cycle engine, which was used in the very first Benz cars. It failed to prove satisfactory, and at a very early date was discarded in favor of a four-cycle motor of such evidently superior construction that numbers of them still are in use in Europe. You are wrong, however, in assuming that the Benz two-cycle engine was an anticipation of the work of Clerk, who certainly produced a two-cycle motor at as early a date as 1882. In construction, the first Benz engine bore little resemblance to the two-cycle motors of the present day. It was fitted with a disk, instead of the now almost universal trunk piston, and a crosshead and a double-end cylinder were used, as in steam practice. The cylinder space beneath the piston was used for the precompression now commonly performed in the crank chamber, and pure air was handled here instead of mixture. A bypass pipe, closed by a mechanically-operated poppet valve at its upper end, connected the two ends of the cylinder, and in addition to this there were two other mechanically-operated valves—an exhaust and a fuel valve—opening into the combustion end of the cylinder. The operation was peculiar. At the end of the power stroke the exhaust valve was opened and as soon as this reduced the pressure enough the air compressed beneath the piston would flow through the bypass and hasten the exit of the remaining gases by a scavenging action. To insure this result the bypass valve was opened at about the middle of the exhaust stroke by a valve mechanism. Immediately after midstroke both exhaust and bypass valves were closed and compression commenced, during which gaseous fuel of liquid-fuel vapor was positively pumped in by an auxiliary pump, until the desired mixture was produced ready to fire. Probably the one particularly interesting feature amidst the crudity of the general design was the fact that this engine handled its charges expansively, expanding the burning gases to double the initial charge volume before exhausting. This helped both cooling and efficiency, and made for a silence of operation at that time less common than it is now.

What Is the Cause of Overheating Here?

Editor THE AUTOMOBILE:

[714.]—I would like to ask a few more questions, if it isn't too much trouble to answer them. I see by my letter (No. 658) that my account of my trouble is not very explicit.

The engine seems to go when the throttle is opened about a quarter of an inch, but does not ignite every time when starting, but does ignite when running, but leaving the throttle open in that way heats the engine too much and stops it.

Meshoppen, Pa.

H. N. F. CRAIGE.

Without any further information than you give in your letter, we should say that the symptoms point to carbureter trouble. Probably the mixture is too rich, which may account for the failure to ignite regularly when starting, provided, of course, that the ignition and other essentials are all in good order. Assuming that the engine is properly lubricated and does not stop owing to the lack of oil when it gets warm, the latter part of your letter would appear to confirm the diagnosis of too rich a mixture. We should think that running with the throttle further open would remedy the trouble, as it hardly seems possible that the engine would pull with any amount of load on when the throttle was open but a quarter of an inch, and so far as running under no load is concerned, it is by far the better plan to stop the engine altogether when not in use.



THE Pennsylvania automobile makes its bow to the public as a high-class machine sold at a moderate price, just sufficient to cover the cost of designing, materials, construction and selling, plus a fair profit, and nothing more. As a new comer it has yet to make a record, and it is only because that record is not made that it is offered at a lower price than the majority of machines of its class.

Two models are built by the Pennsylvania Auto Motor Company, of Bryn Mawr, Pa., and handled in New York by R. T. Peckham, 2234 Broadway. One is a touring car, the other a runabout shorter in wheelbase by about four inches, but similar in all mechanical features. Thus a description of the touring car will serve for the two models.

The frame is of pressed steel, eight gauge, 41-2 inch vertical spread, with 11-8 inch flange at top and bottom, narrowed at the front to give a wider steering angle. A pressed steel sub-frame is provided for the motor and transmission gear. Wheelbase is 112 inches, tread 56 inches. The frame is hung on semi-elliptic springs in the front and rear, with a transverse platform spring in the rear. Dimensions are 40 inches by 2 inches.

Motors.—The motor is a four-cylinder vertical Rutenber, 4 1-2 inches bore by 5 inches stroke, developing 35 horsepower. Cylinders are cast separately, with bearing between each; the inlet and exhaust valves are on one side, operated by a single camshaft. Ignition is jump spark by accumulators and four unit coil carried on the dash. The commutator is located on the upper end of a vertical shaft between the engine and dashboard, where it is accessible and out of the way of oil and dirt. The well-known Schebler carbureter is employed and

throttle and spark are controlled from levers on the steering wheel, but not rotating with the wheel. The engine is lubricated by means of the Kinwood mechanical pressure feed lubricator positively driven by an eccentric and belt from the vertical timer shaft. The engine is water-cooled and has a cellular radiator with water circulation assured by a gear-driven centrifugal pump. A belt-driven fan behind the radiator draws in a powerful draught of air. A new exhaust manifold, specially designed for the Pennsylvania car, permits of ready access to the valves.

Clutch and Transmission.—The cone clutch is of 10 1-2 degrees angle and is actuated by the usual foot pedal, permitting the use of a 450-pound clutch spring, and so designed as to give perfect alignment. The clutch is fitted with a ball spring thrust and a ball clutch thrust. The gear box, like the motor, is mounted on a sub-frame and provides three speeds and reverse, with selective type of change speed lever. All gears and shafts revolve on annular ball bearings, which reduce the loss of power due to friction to a minimum. A double universal joint between the motor and transmission insures perfect alignment.

Drive is by cardan shaft to rear live axle, of the Timken type, fitted throughout with Timken adjustable roller bearings. The pinion and pinion shaft are supported by two cages of adjustable roller bearings, which insure constant and perfect alignment between the pinion gear and the large bevels on the differential. A four spur standard type differential is used, the hub of which is broached to accept the squared ends of the floating type driving axles. On the outer ends of the driving axles are machined square ends, to which are attached driving jaws or clutches that engage similar jaws in the rear wheels. This, the stand-



AS THE PENNSYLVANIA LOOKS FROM THE REAR.

ard type of floating rear axle, embodies every improvement and is built of such material that it is of greater strength than the possible power developed by the motor. The gear mechanism is controlled by a single lever traveling in a H-slot guide, with the piston interlocked between the low and the reverse to prevent any possibility of going into reverse while the car is moving forward.

Brakes.—Two independent braking systems are provided, both operating on drums on the rear road wheels. The foot brake controls a contracting band on the drums, and the side lever operates the expanding internal brakes on the same drum. A unique system is employed to equalize both the foot brake and emergency brake on the rear wheels by means of a link pulling forward from the center of a yoke, which contracts and expands the two bands.

The machine has a road clearance of 9 1-2 inches, and under the motor and transmission gear is a fiber mud pan completely protecting all working parts. It is suspended by means of eccentric clips, and so arranged that it can be dropped in a moment by releasing the clips.

For the touring car the accommodation provides seating for five people, three in the tonneau and two in the front. The body is large and roomy, well upholstered and finished in either Brewster green or Mercedes red. A complete equipment is provided, consisting of tools, gas and oil lamps, generator, horn, etc., and the total weight is 2,700 pounds.

The runabout, known as Model 8, is a racy-looking machine having the same power plant as on the touring car just described but four inches shorter in wheelbase and with the front wheels carried directly under the radiator. The runabout body provides the two usual seats and has, in addition, a folding rumble seat in the rear. A movable trunk is also provided as a part of the regular equipment. This car weighs, complete, 2,200 pounds and is geared 2 1-2 to 1.

Pennsylvania Makes Fast Economical Run.

An interesting demonstration was recently made by the new Pennsylvania car in a run from the factory at Bryn Mawr to Nutley, N. J. The cyclometer registered 116 miles, and this distance was covered on 6 1-2 gallons, which gives an average of 17.7 miles to the gallon. The total distance was covered in six hours, from which must be deducted 50 minutes lost for two meals, giving an actual running time of 5:10, or an average speed of 22.4 miles an hour.

FOR AMERICANS TOURING IN AUSTRIA.

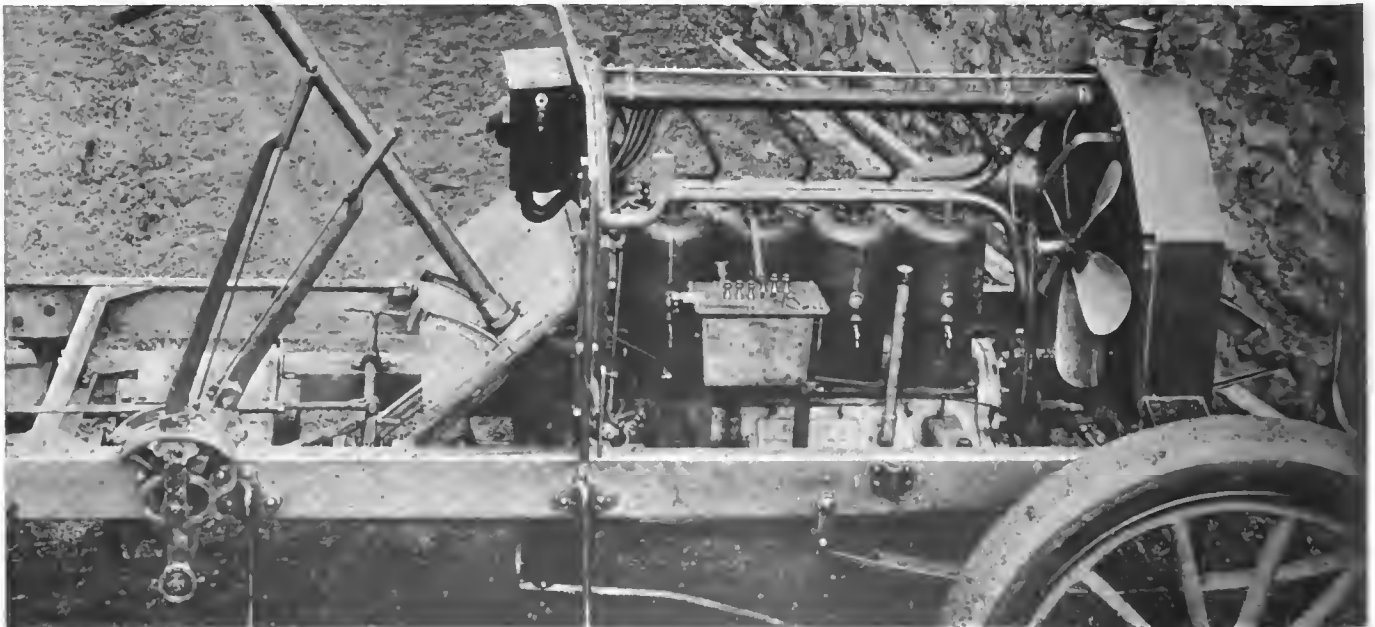
Consul J. S. Twells, of Carlsbad, furnishes the following report on the regulations governing foreign automobilists in Austria:

During 1906, April to November, a large number of American automobilists visited this consular district, in which the well-known Austrian watering places of Carlsbad, Marienbad, and Franzenbad are situated, and as scarcely any owners of machines were acquainted with the regulations in force regarding foreign automobilists, great inconvenience was experienced by many Americans. They thought themselves justified in submitting their grievances to the authorities, hoping to get relief. As the number of Americans coming to this district is likely to be even greater during 1907, travelers using automobiles should make themselves acquainted with the legal rules and regulations now in force, because those who do not understand them may find themselves subjected to disagreeable positions and meet with many troubles and annoyances which could be avoided. The following is an extract from the rules and regulations in regard to automobiles coming into Austria:

For every automobile passing the frontier, no matter whether the automobile remains in the country or not, and without any reference to the machine being old or new, or for private use or business purposes, the full custom-house duty levied must be paid in cash if the machine remains in the country, or the amount is requested to be deposited if it is to be taken out of the country. It is very important that travelers should provide themselves with sufficient Austrian money before they enter the empire.

A duty must be paid or deposited for machines weighing 800 pounds, \$15 per 100 pounds; from 800 to 3,600 pounds, \$12 per 100 pounds; from 3,600 to 6,400 pounds, \$10 per 150 pounds; and above 6,400 pounds, \$8 per 150 pounds. When producing the receipt on leaving the Austrian Empire the money deposited will be returned to the owner. A machine brought into Bohemia may be used fourteen days without restriction. After that time the use is only permitted if it has been subjected to a technical examination by a commission appointed by the chief court of administration at Prague. A tax of 120 crowns (\$24.36) is required to be paid for this examination. Machines coming from certain countries with which the Austrian Government has made a special agreement, as for instance, Bavaria, Italy or Saxony, can be used without an examination three months.

All persons driving motor cars in Bohemia longer than eight days must undergo an examination at Prague or Reichenberg to obtain a license, for which a tax of 50 crowns (\$10.15) has to be paid. Drivers from Italy may drive three months without any examination or license. The speed of a car must never exceed 9 miles an hour in towns and villages or 28 miles on the highroad; during a fog, at crossings, curves, and in all places where special care should be exercised, the speed must not exceed 3 1-2 miles. In inland towns and villages it is not permitted to drive with an open exhaust box.



POWER PLANT OF THE 35-40 H.P. PENNSYLVANIA CAR AND ITS CONTROLLING MECHANISM.

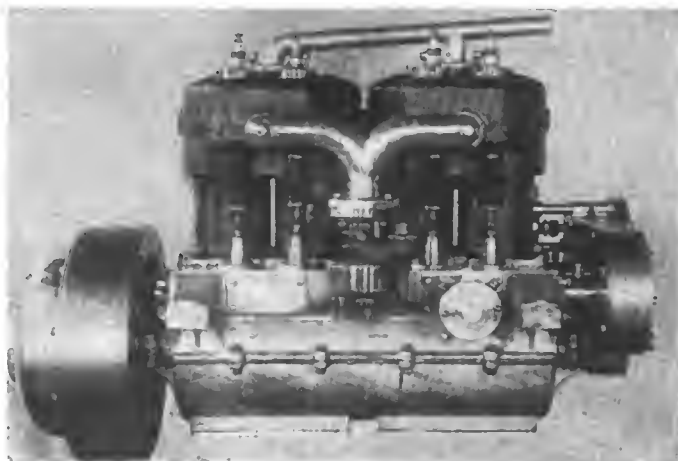


UNDER the title of the "Blomstrom Thirty" one of the most promising entrants of the medium-priced field that the market has brought forth in many a day, is making its debut this season. Though it is thus a debutante, its newness is that of name alone, for from bonnet cap to rear axle it is the product of ripe experience. C. H. Blomstrom, who is its sponsor, was the designer and originator of the Blomstrom "Queen" cars, of which more than a thousand now grace the roads in various parts of the country. They first made their appearance on the market in 1902, and then represented the culmination of many years knowledge gained in practical gas engineering. They were of the horizontal opposed type, then a standard design in this country, and in the course of evolution they were followed by a four-cylinder vertical model, of which several hundred were marketed last year. In the interim, Mr. Blomstrom has become identified with the Blomstrom Manufacturing Company, of Detroit, Mich., in no way connected with the former C. H. Blomstrom Motor Company, and has devoted himself to turning out what may well be termed his best effort in this line.

Motor Design.—The new car is not alone extremely attractive so far as what the Frenchman is pleased to term its *tout ensemble*, but its power plant embodies features of design and construction that reflect the experience of its creator and show how well he has profited, not alone by his own knowledge in this direction, but by the mistakes of others in this field. To put it briefly, the motor is representative of standard practice in every detail; there has been no attempt whatever to depart from accepted and well-proven lines, nor to introduce anything whatever of a radical nature. Reliability and endurance have been the watchwords of the designer throughout, and to this end simplicity and accessibility have been sought

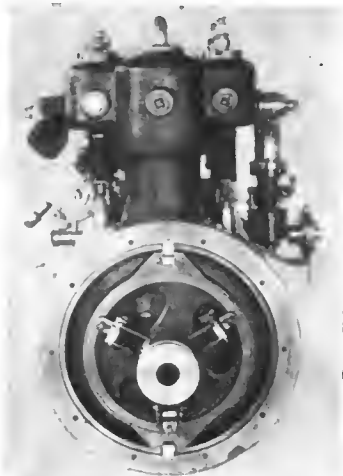
for, not without a goodly measure of success, as will be apparent from the view of the complete motor from the carbureter side, which is shown here. The cylinders are cast in pairs from the best grade of iron especially selected for the purpose and measure 4 3-16 by 4 1-2-inch bore and stroke, respectively, the motor developing its rated output at 1,000 r. p. m. The valves are mechanically operated and oppositely disposed; this arrangement, though it necessitates the use of two separate camshafts, is favored by the designers of many of the best known and highest-priced cars on the market, both of American and foreign build. In fact, for a car designed to be placed on the market at such a low figure, the Blomstrom Thirty contains not a few features usually to be found only on very much higher priced cars.

Motor Accessories.—For ignition, the high-tension system is employed, using accumulators as current supply with dry cells in reserve, the spark plugs being placed directly over the inlet valves. The position of the low-tension ignition timer is at once noticeable as differing considerably from current practice in this respect. It is placed horizontally near the forward end of the motor and is on a short shaft extending out a little distance from the motor, making it very accessible. It is driven by miter gearing from the camshaft, while the circulating pump of the gear type is driven direct from the camshaft gear. The pump is also in a very accessible location, as it is placed much higher on the motor than is customary, being raised well above the level of the bottom of the cylinders. The carbureter has also been placed high, it being quite evident that the designer has borne the matter of accessibility in mind at all times. The neatness and simplicity of the inlet manifold is particularly striking, as will be noted from the illustration showing the carbureter side of motor. All gears are housed.



CARBURETER SIDE OF MOTOR, SHOWING TIMER.

Change Gear and Drive.—The clutch is of a novel design, of Mr. Blomstrom's own creation, and is distinguished by its simplicity. It consists of a complete circle male member fixed rigidly to the flywheel; this carries a raised V of substantial dimensions and the corresponding groove of the clutch in the movable portion consists of three grooved faces on a fixed and a moving member. One, the front angular piece, is integral with



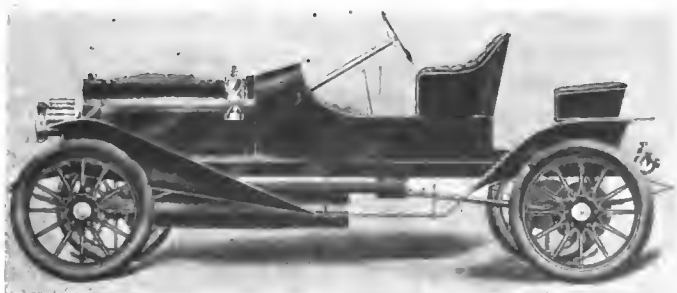
END VIEW SHOWING NEW CLUTCH.

the clutch, while the rear wall groove is detached and has two angular faces, one engaging the rear side of the male V, and one arranged to slide forward on an angular surface of the clutch body. This detached triangular rear wall groove is subdivided into four segments, each of which is pushed forward by a toggle action from the sliding clutch member, so as to cause it to wedge between the inclined rear face of the male member and the rearward facing cone seat on the clutch body itself. It would seem from the description that the device is quite complicated, but the complication lies rather in the language necessary to convey an idea of its working rather than in the apparatus itself—a fact that will be plain from the rear view of the motor, showing the clutch complete and in place on the flywheel. In use it is inclosed by a light casing fastened to the flywheel.

The change speed gear is of the sliding type, all of the pinions being of special nickel steel and hardened. Shifting is selective by means of one lever in a single wide slot, rocking laterally in order to engage either the inner or outer concentric rocker and sleeve rocker arms, giving the different speeds; the gear-shift and the clutch-rocker not being interconnected. The construction of the clutch permits it to serve the double rôle of clutch and universal joint, so that the necessity of a universal between the former and the change speed gear box has been eliminated. A universal is interposed between the rear end of the lineshaft and the forward end of the driving shaft, neither torsion nor strut rods being employed. A bevel gear drive is fitted together with a spur pinion differential.

Running Gear and Suspension.—Weston-Mott axles are employed, the front wheels running on two-point ball bearings and the rear on Hyatt roller bearings. The rear wheels are keyed to the tapering ends of the live axle, forced home and held in place by hexagonal nut retainers. Having so successfully demonstrated the value of the full-elliptic spring on the Queen cars, Mr. Blomstrom has retained them in this case on the rear with semi-elliptics in front. In each case they are 38 inches in length and have five leaves.

General Details.—The steering gear is of the worm and



HOW THE BLOMSTROM "30" RUNABOUT SHOWS UP.

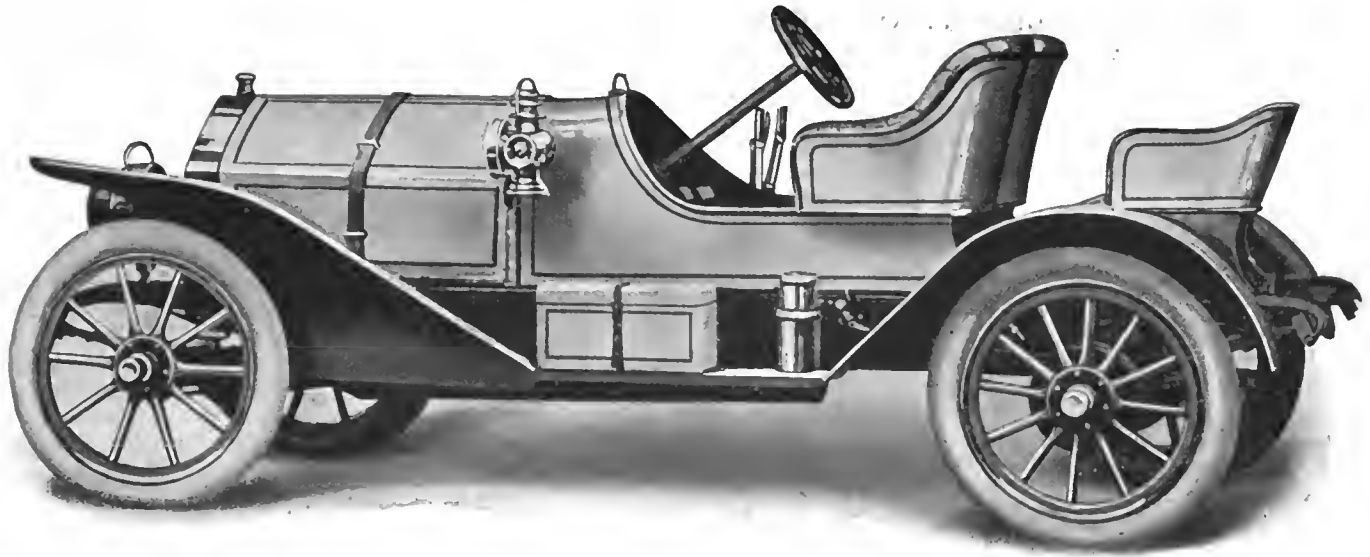
sector type, irreversible, and is designed to be free from backlash. The running brake is pedal operated and consists of a toggle expanded bronze shoe engaging the inner surface of the steel brake drum on the driving wheels; the emergency, which is of the contracting type, also consists of a bronze shoe engaging the outer face of the same drum; it is interconnected with the clutch. The running brake bands are faced with camel's hair belting, while the emergency is metal to metal, *i.e.*, steel to bronze. The wheelbase is 110 inches, the tread standard, and the tires on all four wheels are 32 by 3 1-2 inches. The body design is of the straight-line type, the outline of the bonnet being made to conform so that the car as a whole presents a most attractive and businesslike appearance. Every feature of the car shows that it is the product of a designer who has been through the mill and is fully conversant with what is required to make a car that will be not alone attractive and reliable, but enduring as well, and when a machine combines these three essentials there is nothing further to be said.

PROGRESS OF THE MARINE GASOLINE MOTOR.

According to *Engineering*, the movement for propelling trading vessels of moderate size by internal combustion engines of one type or other—suction gas, petrol, paraffin, etc.—has not been very materially advanced during the year by anything actually done in this country, but on the Continent various partially successful, and on the whole very promising, trials have been carried out. On the Clyde the firm of Beardmore continue to experiment with engines of the Capitaine type using producer gas, and this year, no doubt, definite progress will be made. A small trading vessel, motor-propelled, and carrying some 200 tons, has been running for some time between Swansea and Avonmouth, and the Ailsa Shipbuilding Company, of Troon, has on hand for MacBrayne's, of Glasgow, a vessel of 100 feet in length, to be propelled by motor, and do trading service in the West Highlands. Of course, for pleasure and tender services motor boats are now a common product, and marvellous results are being attained by Thornycroft, Yarrow, White, and the other noted builders of such craft. Motor vedette boats are now being built for the new Dreadnoughts, which are 51 feet over all, and it is estimated that an internal combustion engine, specially constructed to work with the same fuel as in the battleship boilers, of 250 horsepower, will give the same results, as to speed and its cost, as the steam engines and boiler of 350 horsepower which would otherwise have been installed. For the successful motor engines which home firms are now turning out in great numbers, this country has, no doubt, largely to thank other countries. Both in German and Dutch waters steam has been almost entirely superseded.

AUTOS TO HELP SOLVE SERVANT PROBLEM.

Automobile lunch wagons, not the ordinary kind of horseless carriage that has become familiar through its years of service connected to the pavement by water and gas mains on city street corners, but something new in this line, are to be called upon to help solve that bane of all suburban communities—how to keep Bridget. Biddy and all her ilk are to be communized—not on the Sinclair plan or anything similar; they are simply to be boiled down into a central power station, so to speak, from which shall emanate cooked dinners, clean laundry and the other comforts of life according to a schedule. A certain Mr. Robinson, of Montclair, N. J., where the question of having a Kate or Bridget during the cold months becomes exceedingly acute each year, is responsible for the idea. Things have been so bad there this winter that many of the inhabitants were compelled to migrate to the joys of urban hotel life. Hence Mr. Robinson's co-operative plan, which as its *pièce de résistance* includes hot dinners delivered by auto. Whether a waitress is delivered at the same time to serve them does not appear.



SPEEDY REPRESENTATIVE OF THE KLINK LINE

OWING to the demand that was experienced for the Klink car last year, its makers, the Klink Motor Car Manufacturing Company, Dansville, N. Y., have found it necessary to greatly enlarge their facilities at the opening of the second year, and have accordingly increased their capital stock to \$400,000. For the coming season their line consists of a 45-horsepower 7-passenger touring car, a 30-horsepower 5-passenger touring car and a 30-horsepower roadster or runabout, which is pictured at the head of this page. A modern plant has been erected and equipped with every facility for turning out cars at a rate to keep pace with their scheduled delivery dates.

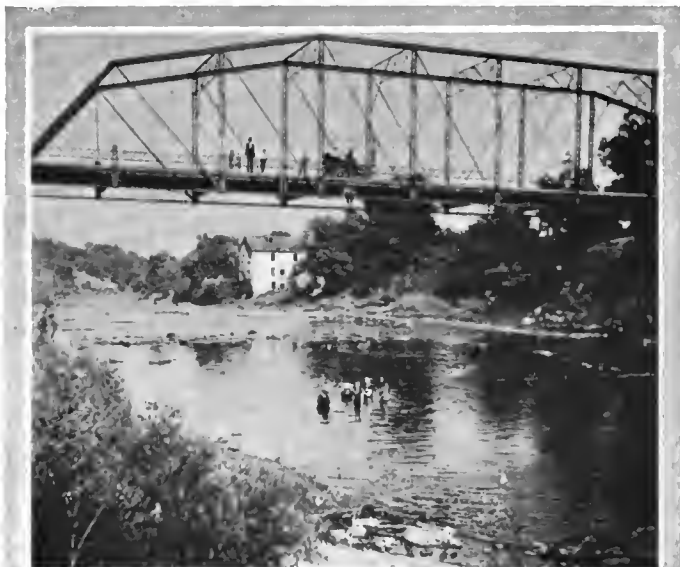
As there is a large call for the runabout type of car, particular attention will be paid to this end, and as will be at once apparent from the illustration, the design is along very attractive and speedy lines, while the proportion of power to weight is high. The motor is of the four-cylinder vertical type of standard design and construction; its dimensions are 4 1-4 inch bore by 4 3-4 stroke, all valves being mechanically operated. A great deal of attention has been paid to obtaining a perfect balance in the motor, so that the latter is unusually quiet-running. The entire power plant is supported on a sub-frame consisting of two substantial transverse members attached to the side members of the main frame, which is of pressed steel and of the usual channel section. An automatic float-feed carbureter takes care of the essential of fuel supply, while the ignition is of the high-tension order, employing a set of accumulators as the source of current supply, with dry cells for reserve. A honeycomb radiator of attractive outline forms the chief essential of the cooling system, the water being circulated by a gear-driven pump. A mechanically-driven force-feed oiler takes care of the lubrication.

The change-speed gear is of the sliding type, progressively operated, and provided with three speeds forward, *et marche arriere*, as the Frenchman puts it, though it seems entirely superfluous nowadays to mention that a car has a reverse gear—almost as much so as it would be to remark that it ran on four wheels. The pinions are of nickel steel. Final drive is by propeller shaft and bevel gearing. Anti-friction bearings are used in many instances, the shafts of the change-speed gear being mounted on roller bearings, as are also the rear wheels, while the front wheels run on ball bearings. As has come to be recognized standard practice, two independent sets of brakes are employed and both are centered on special brake hubs on the driving wheels. They are of the internal expanding and external contracting type, the latter being interconnected with the clutch.

Control is by means of the usual throttle and spark levers, mounted on a stationary sector above the steering wheel, an accelerator pedal also being provided for the former, thus permitting the car to be speeded or slowed down independently of the position of the hand lever, this expedient being found particularly convenient for driving in crowded street traffic. The positions on the quadrant of the change-speed gear lever are plainly marked, so that it is impossible for the driver to shift too far one way or the other in changing up or down. The steering gear is of the irreversible type and no pains have been spared to obtain the required rigidity and certainty of action in this highly important part of the car.

Suspension is by means of semi-elliptic springs of approved type and of the best spring steel, both front and rear; the latter are 50 inches long by 2 inches wide and have 8 leaves, while the former measure 42 inches in length and have but 6 leaves, the width being the same as the rear springs. The wheelbase is 108 inches and the tread standard. As shown in the illustration, the runabout type is provided with a special design of mudguards, which give perfect protection at all speeds. Equipped with two bucket seats, and a rear or "tiger" seat, as well as the usual outfit of lamps and other similar accessories that go to complete the car, the 30-horsepower Klink runabout lists at \$2,000, 32 by 3 1-2 Goodrich quick detachable tires being regularly supplied.

Using the same chassis throughout, and with a touring body having comfortable capacity for five passengers, the Model 30 touring car is constructed so that the foregoing description applies to the latter, with the exception of the body details. The weight all on in the case of the runabout is 1,950 pounds, while the touring car in complete running order tips the scales at but a scant 200 pounds additional, or about 2,100 pounds, which makes the ratio of power to weight unusually favorable in either case and permits the negotiation of anything but unusual grades on the high gear. Dansville, the home of the Klink, is situated in a picturesque valley in upper New York State, and is surrounded by hills affording grades to try the mettle of the best of cars. It is here that the output of the Klink factory undergoes its final trying out before reaching the purchaser's hands, so that its ability in the matter of both hill-climbing and getting over the rough roads for which this country is notorious is well established before it leaves the builders. Both the 30 and 45-horsepower chassis have been designed with a liberal allowance of power for their weight, as well as with ample road clearance and springs meant for traveling over the usual American roads.



A KENTUCKIAN'S RUN INTO ADJOINING STATES By C. M. Shepherd

THE automobile "contagion" had become permanently settled on the south side of the Ohio river, and I was one of the first to contract the fever. Not being content with short jaunts, a desire followed for a long tour, and in the early part of July arrangements were made for a run through Illinois and Indiana. With a party of four, we set out from Owensboro, reached Evansville, Ind., and had a pleasant run to Princeton. From this point we proceeded in the direction of Vincennes, and on leaving Princeton we crossed the "trouble line" in reality, for we received the usual batch of Indiana-ians misdirections and were successfully piloted into a twenty-five mile stretch of newly-made mud road which had just received a baptism of rain, had no bottom, and appeared to have no end either. Had there been a railroad station available we would gladly have shipped our car and given up the trip, for I expected every stroke of the engine to be its last. On we plodded until at last a commutator spring broke in two, and we were persuaded that we should have to apply for horsepower of another variety.

The trouble was soon located, but might not have been as rapidly remedied had not the lady of our party suggested and supplied corset steel. It answered its purpose well, remaining in use until we reached Rutland, Ill. After having plowed many miles of Indiana mud on the low gear, Terre Haute was reached early in the afternoon. During this tour the White river was crossed at a charge of \$3.50; a two-horse team and wagon load of corn was transported for the sum of fifty cents.

Through the Central Counties of Illinois.

The Wabash river was crossed at Terre Haute and our course directed toward the northwest, where we were soon to enter the State of Illinois. Road conditions were fair, except near Bloomington, Ill., where heavy rains and constant traffic had spoiled the surface. There was a notable difference, too, in the attitude of farmers and horse drivers in Illinois compared with those in Indiana. If an Illinois man's horse becomes frightened he attributes the blame to the animal and not to the machine. These conditions are fast changing, and the time will soon come when the horse will have a familiar neigh for the auto.

Fifteen days were spent with Rutland as headquarters, a number of short jaunts being made to neighboring towns. A pleasant visit was made to the historic Deer Park and Starved Rock, a distance of twenty-five miles north of Rutland on the

Illinois river, where we picknicked, used the camera and enjoyed the natural beauties of the place. There is excellent hotel accommodation here, and thousands of people visit the spot every year. The return journey was planned through Bloomington, Champaign, Danville, Crawfordsville, Indianapolis, Columbus, North Vernon, Scottsburg, Salem, West Baden, French Lick, Jasper, Huntington, and south to Rockport. We left Rutland at five in the morning, and tied up at New Ross, 185 miles distant, at 6.30 in the evening. The country thus far was level and the roads in excellent condition. We bowled along, the engine let out to its full capacity, and finished a magnificent run with nothing heavier on our consciences than the death of a few fowls, which, fowl-like, would stand in the road until we were within a few feet of them, then make a wild dash for the side.

Back Again to the Hoosier State.

We were speeding south over excellent roads, the following morning, in the direction of the auto city of Indianapolis, which we reached in the early forenoon and quitted in the early evening to continue to Edenburg, where we had an appointment for the night. North Vernon, our next scheduled point, was reached at nine o'clock in the morning by the Michigan-Indiana State road, which runs from Michigan City to Madison, Ind. Near North Vernon the road was blocked by a long procession of spring-wagons, surreys, buggies, and jolt-wagons, en route for the Jennings county fair. We were anxious to go ahead of the procession, but they, on the other hand, had different views, and kept us in the rear of the snail march for three or four miles, at times driving three or four abreast to keep us behind. Finally we got through and gave them a taste of our dust as we speeded away.

Early on the fourth day we moved southward by the way known as Nigger Hills, parts of which are unknown to the autoist, and which may be described as of the "bumping the bumps" order. This condition continued for about seven miles south, then fair roads reappeared and continued into Scottsburg. Turning due west from Scottsburg we were soon on the "trouble line" again. Roads of stone, gutters of dust, and apparently river beds of rock, with hills such as we have never looked upon east of the Rocky Mountains, were now our lot. At the foot of each hill was a bad culvert, which made coasting an impossibility. At the close of the day we anchored at Salem, Ind., a picturesque village on the summit of the noted Salem hill, where excellent hotel accommodation was secured.

In the Unfrequented Nigger Hills.

Refreshed and joyous, we speeded westward the following morning, little dreaming that the worst was yet to come, and that the roads we had traveled over were macadam compared to those which lay before us. Not only were they unknown to the automobilist, but they did not bear the slightest evidence of ever having been used by the ordinary vehicle. Large boulders, which might have been straddled by a high buggy, filled the center of the track. While we were zigzagging round these obstructions we were informed by natives that we were approaching Pots Hill, a point that an automobile had never been known to pass without the assistance of a team. The natives had not exaggerated, but we got through under our own power, although the car is only a single cylinder machine, a Cadillac model M.

It is impossible to give an adequate description of the road conditions about this district. All that can be said is "beware of the Nobs." We touched numerous small villages in which our car was the first that had ever been seen. Excitement was great, and we heartily enjoyed watching the actions of both young and old, eager to lay their hands on the machine.

The road conditions mentioned continued well into Jasper, where we turned abruptly south, leaving the Indian Rockies far in the rear, and experienced smooth sailing into Rockport, Ind., where we took the ferry across the Ohio and reached Kentucky soil with a full knowledge of a little travelled route and a resolution to give it a wide berth on our next trip to the North.

FIVE STATE BODIES ADDED THE GROWING A. A. A.

THE A. A. A. continues to increase and prosper under the energetic efforts of the Hotchkiss-Elliott administration, and in the past ten days five State associations have been added to the national roster: Pennsylvania, Maryland, Kentucky, Indiana and Missouri. Michigan and Wisconsin are additions of the early future.

The A. A. A. list now contains twelve State bodies: Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Maryland, Ohio, Indiana, Illinois, Minnesota, Kentucky and Missouri. The Rhode Island Automobile Club in Providence is to become shortly the nucleus of a State organization; Vermont is a "soon" probability, and Michigan and Wisconsin are sure. At the next meeting called by President W. H. Hotchkiss the Executive Committee may have a dozen applications to act upon, and the total number of State bodies may reach a score or more. Apparently the retention of the greater part of the dues and the conduct of affairs in their own borders is responsible to some degree for the rapidly increasing number of State associations.

Maryland Now Has Its State Body.

BALTIMORE, April 15.—Desiring to obtain better conditions in automobiling, the Automobile Club of Maryland and representatives from the various other clubs throughout the State met last week and formed the Maryland State Automobile Association of the American Automobile Association.

The meeting was presided over by H. M. Rowe. Secretary Frederick H. Elliott of the A. A. A. was present and spoke at length upon the benefits to be gained through State associations and membership in the national organization.

After the new association had been formed by a unanimous vote, Osborne I. Yellott spoke on the practicability and feasibility of establishing a legal bureau for the State association. Subsequently it was decided to appoint a legal bureau, to be supported by a small assessment upon the members, whereby counsels will be stationed in almost every town to render service to autoists who are unfairly arrested for alleged non-observance of the speed laws. Each member will carry a card of identification, which will be the medium to secure immediate representation of belated motorists wherever they may be detained, since the State association will guarantee a fee to any lawyer who defends one of its members.

Pennsylvania Motor Federation in the A. A. A.

PITTSBURG, PA., April 15.—At its recent annual meeting, held at the clubhouse of the Pittsburg Automobile Club, the Pennsylvania Motor Federation unanimously decided to affiliate with the A. A. A. President W. H. Hotchkiss was present by special invitation and the forcible and convincing address which he made was a factor in the decision to become a part of the national organization. The Federation contains fifteen of the twenty-one clubs in Pennsylvania, and those outside of the breastworks are likely members of the near future.

These were the clubs and delegates represented in the annual meeting: Isaac Starr, president Automobile Club of Philadelphia; Robert Hooper, president Automobile Club of Germantown; F. R. Slifer, Milton Automobile Club; Paul C. Wolff, Dr. J. C. Hawkins, Pittsburg Automobile Club; John C. Gragdon, representing Pittsburg Consulate, A. M. L.; Dr. W. G. Cook, Wilkesburg Automobile Club; Jacob Rider, Lancaster Automobile Club, and A. H. Martin, the Automobile Club of Delaware county.

In the election of officers the result was as follows: President, Isaac Starr, Automobile Club of Philadelphia; first vice-president, Robert P. Hooper, Automobile Club of Germantown; second

vice-president, F. R. Slifer, Milton Automobile Club; secretary, Paul C. Wolff. The latter was active in the formation of the Federation.

The committee chairmen announced were: Good Roads Committee, Peter A. Meixell, Wilkes-Barre Automobile Club; Legislative Committee, S. Boyer Davis, Automobile Club of Philadelphia; Touring Committee, State Senator Godcharles, Milton Automobile Club; Publicity Committee A. H. Martin, Delaware County Automobile Club. These committees will be organized by the selection of a member from each club of the Federation. Messrs. Starr and Hooper have been particularly energetic in bringing about the affiliation of the Federation with the A. A. A. Mr. Hooper is chairman of the A. A. A. Good Roads Board, and intends that his board shall work industriously for Government aid in roads building.

Kentucky's Leading Club Joins the A. A. A.

LOUISVILLE, KY., April 15.—At the annual meeting and banquet of the Louisville Automobile Club, held at the Louisville Hotel, George H. Wilson for the fourth time was elected to the presidency of the club, which unanimously decided to join the A. A. A. and at once organize a Kentucky State Association of the national organization. Secretary F. H. Elliott and Executive Committee member A. G. Batchelder of the A. A. A. were present and made addresses.

In addition to re-electing Mr. Wilson, the club selected for first vice-president Dr. W. C. Pfingst; second vice-president, Pike Campbell; secretary, Charles Chreste; treasurer, J. B. Lewman. The club is arranging for a tour of the bluegrass section of the State, held for the purpose of interesting Kentucky automobilists in the State body.

Hoosiers in the A. A. A. Procession.

INDIANAPOLIS, IND., April 15.—The Indiana State Automobile Association was born last Friday night at an enthusiastic meeting called by the Indiana Automobile Club and held at the Columbia Club in this city. The delegates present were: Indiana Automobile Club, President P. E. Hibben, H. O. Smith, R. A. Brown, R. J. Eads, George A. Weidley, F. N. Ayers, George W. Pangborn, H. H. Rice, L. H. Levey; Kokomo, Edgar Apperson; Richmond, J. A. Speckeneher; South Bend, Horace Kizer, M. L. Williams, Mr. Briggs.

The election of officers resulted as follows: President, H. O. Smith; first vice-president, John Cox, Terre Haute; second vice-president, Horace Kizer, South Bend; treasurer, J. A. Speckeneher, Richmond; secretary, Edgar Apperson, Kokomo.

It had been expected that coincident with the meeting would be a session of the leading engineers of various automobile concerns for the purpose of drawing up rules for the stock car race over the Long Island Motor Parkway in October next. A. G. Batchelder, member of the A. A. A. Racing Board, and also of its Executive Committee, informally discussed rules for such an event with Messrs. Smith and Apperson and others. It is expected that the postponed conference will take place in the near future. Secretary F. H. Elliott was present in his official capacity and convincingly explained the worth of a national organization and the general good it accomplishes for automobiling.

Missourians Were Shown by Secretary Elliott.

ST. LOUIS, Mo., April 15.—The Missouri State Association of the A. A. A. has been organized by the election of Harry M. Rubey of the Macon Automobile Club as president and Roy F. Britton of the St. Louis Automobile Club as secretary-treasurer. Secretary F. H. Elliott of the A. A. A. was present at the session, which was held at Macon, about midway between St. Louis and Kansas City. Mr. Rubey is the Mayor of Macon.

AUTO CLUB DOINGS FAR AND NEAR

Joint Orphans' Day Run Projected in Chicago.

CHICAGO, April 15.—At the last meeting of the directors of the Chicago Motor Club it was decided to observe the National Orphans' Day, June 12, which was recently instituted by the A. A. A. The club appointed a committee consisting of N. H. Van Sicklen, chairman; Fred E. Dayton, L. J. Ollier, J. V. Lawrence and Harry P. Branstreter to confer with the Chicago Automobile Club and Chicago Automobile Trade Association with the view of making the celebration of the day a general one among automobilists of the city.

The new \$165,000 clubhouse of the Chicago Automobile Club is rapidly approaching completion, and it is confidently predicted that it will be practically ready for occupancy by May 30. President Cobe, in speaking of the progress made, states that he is more than confident that the club will take possession by Memorial Day. "The contractors are now making very rapid progress," he says, "and unless some unforeseen incident bobs up our patient members who have been homeless so long will find a roof to cover them at 15 Plymouth court in a little more than six weeks. As soon as we get in there we will start doing something. The Glidden tour is of great interest to us and the Chicago Automobile Club is going to hold up its end in the entertaining line when the tourists reach this city for their Sunday stop. We are going to have a special committee to look after the entertaining, but I will not appoint it for a while, because it is some three months off, that tour.

"We are taking in about a dozen new members every meeting. Ten were admitted yesterday and now our list is almost full. You know we have a waiting list at 600, and, while I don't know positively, I believe there are only about a dozen vacancies left."

Vermonters Organize Automobile Club at Rutland.

RUTLAND, VT., April 8.—An organization to be known as the Rutland Automobile Club was formed in this city April 6. The following officers were elected: President, William H. Riddle; vice-president, Percival W. Clement; secretary, Charles A. Matthews; treasurer, Wallace W. Nichols. Committees on nominations and by-laws were also elected and a board of governors, of which Gov. Fletcher D. Proctor is chairman. William R. Riddle, of this city, a member of the Touring Committee of the American Automobile Association, was chiefly instrumental in organizing the club, which is the first local association to be formed in Vermont. It is expected that the membership will be about fifty. The object of the club will be to promote interest in the sport, foster the good roads movement, and compel careful driving on the part of its members.

New Club of Sixty Members at Akron, O.

AKRON, O., April 12.—The directors of the Akron Automobile Club have organized by electing the following officers: President, C. C. Goodrich, of the B. F. Goodrich Company; vice-president, Andrew Auble, of the Akron Automobile Garage Company; treasurer, A. B. Rinehart, of the Union Garage. The club will have headquarters and clubrooms, and it expects to make a persistent fight for good roads and favorable ordinances for the use of the city streets. About sixty members have been enrolled.

Kentucky Autoists Organize a Club at Paducah.

PADUCAH, KY., April 15.—Seventeen leading automobilists of this city have organized the Paducah Automobile Club and elected the following board of officers: President, P. D. Fitzpatrick; vice-president, F. E. Lack; secretary, Roy Grassham; treasurer, Richard Ruddy. In addition to the above-named officers Benj. Weille and Samuel Foreman constitute the board of directors.

Monk's Hill Selected for the Quaker City Climb.

PHILADELPHIA, April 15.—Monk's Hill, a tricky, sticky-in-wet-weather, mile-long grade leading up out of the Schuylkill valley at Gladwyne station, on the Philadelphia & Reading railroad, has been finally decided upon by the contest committee of the Quaker City Motor Club for its Decoration Day hill club. Besides a none-too-good surface and an average 20 per cent. grade, Monk's Hill possesses all the requirements of the modern hill-climbing course, including thank-you-ma'ams and the inevitable "elbow"—though this time his Satanic majesty and the hairpin have been sidetracked in seeking a name for the sharp loop and the name "Quaker" substituted. The "Quaker's elbow" will furnish an ample test of a driver's ability in negotiating a fast-running car up its slope, while those who contemplate "rushing it on the high" will in all probability be considerably wiser before they reach the top.

Located less than ten miles from the clubhouse, the course may be reached by the most direct route in 20 minutes, while with the Reading station within a few hundred yards of the start spectators can be landed there within 15 minutes from the Reading terminal. Besides, in selecting this hill the contest committee has neatly solved the traffic problem, for the road is seldom used and a permit will hardly be required.

Site for Grand Rapids Club House Selected.

GRAND RAPIDS, MICH., April 15.—The Grand Rapids Automobile Club has settled the matter of a new clubhouse, and at a special meeting of the club a committee was selected to secure a site at Cascade Springs. At the meeting a committee was also appointed to investigate the matter of paying toll on toll roads. The club will fully determine the rights of automobilists in that direction. It has been suggested that the automobile owners of Kalamazoo form a club and that the two clubs then combine with a clubhouse midway between the two cities, but this plan is not finding much favor.

Annual Tour of the Albany A. C. Set for June 20.

ALBANY, N. Y., April 15.—Atlantic City, by way of New York and Asbury Park, is destination and route chosen for the annual tour of the Albany Automobile Club which is scheduled for June 20. Last year the club tour was through the Berkshires to Boston. At the last meeting of the club five new members were elected, and resolution was adopted requesting the city authorities to instruct its police officers to enforce the observance of the rules of the road upon both drivers of automobiles and horses for the greater safety of the traveling public.

Newark Club Nominates Officers.

NEWARK, N. J., April 15.—At the last meeting of the board of governors of the New Jersey Automobile and Motor Club, Angus Sinclair was nominated for president of the organization. The Board of Governors also placed in nomination Louis T. Wiss as president to succeed Mr. Sinclair, who has occupied that position for the past year; James C. Coleman as treasurer, H. A. Bonnell as secretary, and Joseph H. Wood, W. F. Kimber and W. C. Crosby as trustees. The regular election of officers will take place at the annual meeting of the club on May 6.

J. C. McCoy Elected Vice-President of the Aero Club.

NEW YORK, April 15.—At a meeting of the Aero Club of America held last week J. C. McCoy was elected vice-president in place of Homer W. Hedge, who resigned both as vice-president and director. Ten new members were added to the rolls. It was decided to accept the trophy offered by the *Scientific American* for aeroplanes, the first contest to be held at Jamestown.

THREE FRENCH AEROPLANES HAVE FLOWN

PARIS, April 7.—Santos-Dumont has a serious rival in Léon Delagrangé, the French sculptor with aeronautical tendencies. On the Bagatelle polo ground a few days ago, M. Vuia had interested the idlers by giving displays of short flights with his little machine, when Delagrangé asked Charles Voisin to make a run. There were few people about, the ground being particularly free for experimental flights. A couple of false starts were followed by a flight of about twelve yards to windward, the machine heeling over slightly. To establish equilibrium Charles Voisin fixed a weight on one of the wings, mounted the cage,

in idleness, but on the end of the third day, the weather being fine and ground fairly hard, preparations were made for what might have been an epoch-making event. Santos-Dumont ordered his machine out, climbed up into the cage, started his motor, and in less time than it takes to tell was rushing down the drill ground. Thirty yards away the *Bird of Prey* rose six or seven feet in the air, rushed on for sixty or seventy yards, rolling dangerously, finally touched the ground with the right wing, capsized and came to a stop. All this had taken place within a few seconds, thrilling seconds for the spectators, who

realized the danger to which the air pilot was exposed. Before the little group could reach the wrecked machine Santos-Dumont had extricated himself and shouted out that there was nothing the matter. On a closer examination it was surprising to find that there was so little damage; one wing was broken, a road wheel was smashed, but the motor and transmission were intact. In three or four days all will be again ready and another permanent deputation will be sent from the Aero Club to Saint-Cyr.

It is just possible that the accident may cause Santos-Dumont the loss of the \$10,000 prize, for three other aeroplanists are ready to attempt the kilometer circuit, among them being Léon Delagrangé, whose machine has already flown seventy

yards in excellent style. The prize goes to the one who first fulfils the conditions set for the contest.

St. Louis Secures Lahm's Famous Balloon.

The *United States*, the balloon in which Lieutenant Lahm won the Gordon Bennett aero cup last year from Paris to the North of England, has been sold to the Aero Club of St. Louis and will be refitted immediately. J. C. McCoy, who has been elected vice-president of the Aero Club of America, and will be the executive head of the organization after Cortland Field Bishop sails for Europe on April 18, expects to try to win the Lahm cup by making a flight of more than 402 miles from St. Louis the latter part of this month. Mr. Hawley will make an ascension soon afterwards.



DELAGRANGE AEROPLANE FLYING TO WINDWARD OVER BAGATELLE GROUND, PARIS.

started up the motor, and in a few seconds was running down the field toward the racecourse, wind still ahead. After about one hundred and fifty yards sprint on the ground the machine rose fourteen feet in the air and covered a distance of 65 yards at a speed of thirty-six miles an hour. A cheer rose from the little group of enthusiasts watching the experiments, and Voisin, surprised and delighted, momentarily forgot himself and cut out his ignition. The machine gently descended to Mother Earth, uninjured and ready to begin again. It is certain that had Voisin left his engine running his machine would have traveled to the end of the polo ground in perfect equilibrium. Santos-Dumont, who was present, warmly felicitated Voisin and Léon Delagrangé, and declared that there was nothing whatever to prevent a continuance of the flight. There are now three aeroplanes in France which have made successful public flights: the Santos-Dumont *Bird of Prey*, the Vuia and the Delagrangé machines. This latter, which has been built by the Voisin Frères, of Billancourt, Paris, has a 50-horsepower Antoinette motor with eight cylinders forming V and direct induction feed without carbureter. The superficial area of the machine is 60 square meters, weight 660 pounds, with rear propeller of 90 inches diameter, and a rudder forward.

Santos-Dumont Resolved to Win Aero Club Grand Prix.

Since the breaking of his new aeroplane, Santos-Dumont has brought out again his *No. 14 bis*, with which he won the Archdeacon prize for a flight of 240 yards, and has been making further experiments. Propelled by the 50-horsepower Antoinette motor, the machine has given such satisfaction that its proprietor has decided to attempt to win the \$10,000 Deutsch-Archdeacon prize for the first aeroplane covering a circuit of one kilometer. Three days were fixed, and a deputation was sent from the Aero Club of France to remain at Saint-Cyr from sunrise to sunset, as specified in the regulations. April showers, alternating with March winds, caused the two first days to be passed



HYDROPLANE TESTING AERIAL PROPELLER ON SEINE.

The hydroplane shown in illustration has been built by Bonnemaïson of Paris, for making comparative tests of aerial propellers.



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Need for an Independent Body of Auto Engineers. Whether the automobile engineers will find satisfactory two distinct organizations, each under commercial and antagonistic restriction, or whether they will meet in the open arena of an independent organization in which the general advancement of automobile engineering without special reference to commercialism is the main object, may have to be determined by the mill of experience. That any organization which brings men together for an interchange of ideas and a discussion of a multitude of undetermined propositions, promoting an advanced engineering production and a uniformity of construction, is of immense value to the industry, needs no sustaining argument. It is equally apparent that the greatest benefit will be derived from the widest publicity of these deliberations, and any attempt at secrecy or exclusion has not only a belittling tendency to the participants, but defeats the whole object of co-operative investigation. Whatever temporary advantage might accrue to a manufacturer whose engineer may have solved one of the problems by himself is more than offset by a lack of knowledge of results secured by others.

The engineers are generally responsible not only for the success of individual enterprise, but for the industry as a whole. A purchaser of one imperfectly constructed automobile may injure the sale of any number of reliable machines. The field of undemonstrated experiment is as yet too large to warrant toleration by the broadminded engineer of any transient secrecy of construction or design, and a comprehensive interchange of ideas will be alike beneficial to the individual enterprise and the industry at large. While engineering sections of corporate combinations are doing much for their individuals numbers, it should

not preclude the establishment of a more comprehensive organization where qualification for membership should be limited only by engineering ability.

The Society of Automobile Engineers has been organized to meet this requirement. It now rests entirely with the engineers to determine if the organization shall survive, and supplement in preponderating degree the two restricted bodies now in existence. There is now need, indeed, for an assured open forum.



New York's Late Awakening. It has long been a current saying *ing to the Gasoline Cab.* that none but millionaires could afford to ride in a cab in New York, and though, like many other things, much exaggerated, still it is founded on fact. In no other city of importance in the world are cab fares so high, and, in consequence, cabs and cab riders so few. Paris, with a population of 4,000,000 in round numbers, can boast of something like 10,000 cabs constantly in service, while a like number are in storage according to the season, for the Parisian cab, like the American street car, changes winter and summer. Next to Paris London is the world's greatest cab center, but with a population almost twice as great, it has fewer cabs. New York is scarcely to be mentioned in the same category with many a city of the third or fourth class where cabs are concerned, for it is doubtful if more than a thousand or two are in regular service.

Radically differing traffic conditions coupled with New York's peculiar topography do much to explain this great discrepancy, but these and the vastly higher scale of expenditures prevalent do not shed any light on the fact that it costs five to ten times more to patronize a cab here than it does in either Paris or London, where the rate covers the transportation of one person or two for the same price. Within the past few months New York has had an awakening—she has come to realize of a sudden that the ancient and lumbering aggregations of old storage batteries and badly disaligned running gears that go by the name of electrics were cast on the scrap heap abroad two or three years ago and that light and speedy gasoline-driven cabs have not only taken their place, but also routed the horse cab to a considerable extent. Plans to do likewise here on a truly ambitious scale are now under way, and, if predictions be fulfilled, a year or two hence should see New York's streets populated with more gasoline-driven motor cabs than they have ever boasted of any kind.

It is sincerely to be hoped that the plans in question will not be carried into effect in the procrastinating and long-drawn out manner that has characterized the oft-heralded transformation of the Fifth Avenue stage line.



Aeronauts Are Becoming Exceedingly Optimistic. Aeronauts of the heavier-than-air school are in an optimistic frame of mind. Ignoring the alleged flights of the Wright brothers, three aeroplanists, with widely differing types of machines, have made public flights of sufficient length to far remove them from the running jumps which certain critics maintained was all that had ever been accomplished, or could be accomplished by the aeroplane. It is true that the flights have not been of great length—Santos-Dumont holds the record with 240 yards—but it must be remembered that we are working in an entirely new field and that frequently a machine is brought back to earth not because of its inability to remain longer in the air, but because its pilot hesitates to push his experiments to the danger limit. Santos-Dumont and his equally enthusiastic rivals are convinced that the Deutsch-Archdeacon prize for a flight of one kilometer in a circuit will be gained this year. Such a performance would prove irrefutably that the problem of aerial flight has been solved. The internal combustion motor has played, and will continue to play, an important part in this fascinating problem. Without the light multi-cylinder engine which Levavasseur has designed for aerial work, even the genius and intrepidity of a Santos-Dumont would be of little avail.

NAPIER COMPANY OF AMERICA FAILURE.

BOSTON, April 15.—Judge Dodge, of the United States district court, has appointed Arthur J. Farnsworth, vice-president of the Napier Motor Company of America, receiver for the concern, which was petitioned into bankruptcy last week by Boston creditors whose claims amount to about \$1,300. These creditors: the Vacuum Oil Company, whose claim is \$225; Ezra B. Whittier, who holds a claim for \$76, and William H. Wilkinson, whose claim of \$1,009, filed an involuntary petition in bankruptcy against the Napier company, and as the directors had admitted their inability to pay the debts and their willingness to be adjudged bankrupt, the court allowed the petition.

The attorney for the company stated that the receivership proceedings were brought about by reason of the company trying to do too much business on a limited capital. The receiver will make an immediate examination of the assets, and it is likely that the company will be reorganized. The company last week closed its salesroom on Boylston street, and last Wednesday night the large factory in Jamaica Plain was shut down. The company has been in existence several years and is capitalized at \$600,000, half common and half preferred stock. The paid-in capital was \$232,000. The liabilities are said to amount to about \$140,000.

ADVANCE GUARD LEAVES ON GOLD CUP TOUR.

To prepare the way for the Gold Cup tourists who will this summer travel 6,000 miles through Europe, Georges Dupuy left New York last Saturday with a 30-horsepower Stearns car provided by Wyckoff, Church & Partridge. The *Vaderland* will land Mr. Dupuy and his American automobile in Antwerp near the end of the month, and from there the party will proceed direct to Paris, leaving a few days later for a run round the entire district to be traversed by the main party. It will be a severe test of the quality of the machine, for the run will have to be accomplished as quickly as possible in order to get back to New York a little time before the departure of the main body.

Mr. Dupuy will prepare a guide book with the itinerary of the trip, having maps and descriptions of the various places of interest to be visited, together with a brief compilation of the idioms and common phrases of speech in the various countries.

Twenty-seven American cars have been nominated for the tour, while in addition to the entrants thirty-one persons have applied for seats in the competing machines. It is expected that there will be a considerable increase before the cars leave New York on June 1.

PENNSY'S TOLL ROADS MAY BE ABOLISHED.

PHILADELPHIA, April 15.—On Tuesday night last, without any fuss or feathers, the first step was taken in the Pennsylvania Legislature, now in session at Harrisburg, which may eventuate in the utter abolition of the hated toll-gate throughout the entire State within the next five years. On the evening in question Representative Minehart, of Franklin county, introduced a resolution, which was adopted, ordering the State Highway Department to at once begin inquiries to ascertain the cost of taking over and converting into State roads all turnpike roads on which tolls are now collected.

SUIT INVOLVING THE UNIVERSAL RIM.

AKRON, O., April 15.—F. A. Seiberling, as general manager of the Goodyear Tire & Rubber Company and for himself, has begun an important action in the United States Court in Buffalo against the Hartford Rubber Company, the Morgan & Wright Company, and the G & J Tire Company, all claimed to be members of the United States Rubber Company, in which Seiberling alleges infringement of his patent on his Universal rim for detachable tires. Mr. Seiberling claims exclusive rights of the sale by a patent secured by him in 1904. He alleges that this unlawful sale has been going on for a year.

DENATURED ALCOHOL NOT PROFITABLE AS YET.

TERRE HAUTE, IND., April 13.—Though the workings of any trust are hard to fathom and too much credence should, in consequence, not be accorded surface indications, it is reported that the Majestic distillery at this place, which was equipped by the alcohol trust to make denatured alcohol on a large scale, is still idle and there is little prospect of its starting up in the near future. The Industrial Company, formed by the trust to place the denatured alcohol on the market, is said to have found that the product cannot compete with gasoline as yet. Another trust plant, the Atlas distillery at Peoria, Ill., which was running in full blast, using 7,000 bushels of corn daily in the making of the denatured product, has been cut down to 2,500 bushels a day. It is thought that the Majestic plant will be allowed to remain idle until fall.

POPE COMPANY MAY MOVE TOLEDO PLANT.

TOLEDO, O., April 15.—The story has been floating about this city for the past three or four years that the Pope Motor Car Company contemplates moving elsewhere. Owing to the large investment the company has in this city in the line of buildings but little credence has been placed in the reports, the latest of which is to the effect that the concern would be moved to Elyria, Ohio. Color has been lent to the report on account of the labor troubles the firm has been experiencing for some time past.

Toledo has a chance to get the new plant of the Craig-Toledo Automobile Company, which is operating a plant at Dundee, Mich. Toledo and Detroit at present have the inside track, but the chances are greatly in favor of the latter, for Toledo has allowed several similar opportunities to go by the board.

FUTURE PLANS OF MORA COMPANY.

NEWARK, N. Y., April 15.—Owing to increased business, the Mora Motor Car Company has made arrangements for the erection of a modern two-story factory with an area of 30,000 square feet. The old shop will continue to be occupied, awaiting the erection of the new building, and later will be used as a paint shop and testing room. The new company is to be incorporated under the laws of the State of New York with a capital of \$750,000. The officers are: S. H. Mora, of Rochester, president; T. W. Martin, of Newark, vice-president; W. N. Freeman, secretary and treasurer. The board of directors are: J. R. McLaughlin, Canandaigua; T. W. Martin, Frank Garlock, C. L. Crothers, Newark; L. A. Parkhurst, Canandaigua; W. N. Freeman and S. H. Mora, Rochester.

SHOWS LARGER N. Y. REGISTRATION.

ALBANY, N. Y., April 15.—Secretary of State Whalen reports for the first quarter of 1907 the following receipts from the fees charged motor vehicle owners for registration and for licenses as compared with the same three months of 1906:

	1906	1907
January	\$10,485.06	\$10,477.52
February	9,395.07	10,776.50
March	3,083.35	4,154.20
Total	22,963.48	25,408.22
Increase for quarter..		\$3,444.74

MACK BROS. MOTOR CAR CO. JOINS A. M. C. M. A.

The American Motor Car Manufacturers' Association is continuing its strides in the line of increased membership as shown by the announcement that the Mack Bros. Motor Car Co., of Allentown, Pa., had applied for admission and was elected. Two other applications are now in the hands of the membership committee. The Mack Bros. Motor Car Co. makes the Manhattan sightseeing busses which are to be seen in almost every prominent city. It is now devoting a section of its factory to commercial trucks.

LATEST AUTOMOBILE DOINGS IN BRITAIN

By JOSEPH A. MACKLE.

LONDON, April 10.—Ever since the commencement of the motor industry continental motor manufacturers have found in Britain a ready market for their productions; France in particular having been able to dispose to John Bull of a proportion of its yearly output estimated at nearly fifty per cent. Of late, however, a marked change is apparent. Somewhat dubious of the advantages of a free trade system which enables the foreign manufacturer to dump his productions down without any charge, the Britisher is beginning to blow the "all-British" trumpet. As a result of this tendency the British automobile industry is experiencing a busy time, and prospects are extremely satisfactory. Continental manufacturers have been quick to recognize the trend of fashion, and in several cases have decided to open British factories for the construction of their cars. In this way the recently formed Lorraine De Dietrich, Ltd., has acquired the Ariel Motor Works at Birmingham, and will be turning out Dietrich cars in a few months. In like manner the Holland firm of Spyker, Ltd., and the Belgian Metallurgique Co. expect to have their British factories in full working order by the end of the season. Rumor has indicated the Winton Motor Carriage Co. as another addition to the movement, but except that a representative of the company was said to be seeking out a site for works last Christmas, nothing definite has transpired. Whether this last is correct or not, matters certainly seem to indicate that it will be necessary for any firm contemplating a big British trade to build, or at least to assemble, their cars over here in England.

Growth of the Motor Union.

The annual meeting of the Motor Union, recently held, has revealed a surprising growth in membership during the past year. Since the previous meeting the affiliation of twenty-four clubs increased the number of members by 3,524, and the addition of over 1,000 individual members had made a grand total of over 14,800 in the Union. While the Royal Automobile Club—the new distinctive title conferred by King Edward on the A. C. G. B. I.—looks after the social and competitive side of motoring, the Union safeguards the legal interests of the youthful industry. Applications for the imposition of speed limits in towns are opposed when this course is desirable, and the well supported arguments offered by the Union have in many cases resulted in the rejection of the application. Appeals against vindictive sentences on motorists are undertaken whenever such proceedings are likely to benefit motorists in general. Further, in view of the importance to the motor industry of a suitable and adequate supply of fuel, a competent committee of the Union has been pursuing work on this question for several months and the report may be expected to contain much valuable information.

The Motor Union Insurance Co. is now firmly established, and the benefits resulting to members have exceeded the original expectations. A further innovation which is expected to be productive of useful results is the provision of special badges which are issued to members for attachment to the dashboard or bonnet of their cars. Members of the Union will by this means be easily identified, and as the badges remain the property of the Union, the committee can demand their return in cases of inconsiderate driving. With the big membership and a balance in hand of over \$8,000, much good work will doubtless be performed during the coming year.

Makers Will Limit the Shows.

The continuous succession of provincial shows and exhibitions, at which the enterprising manufacturer feels compelled to exhibit, seems likely to die out in future years. From the Olympia show last November till now show chassis and tired attendants have been traveling round the country looking for business which—often enough—was not to be booked. Conditions of business in

the motor industry have undergone a radical change in the past few years, and the greater proportion of business with private customers is now in the hands of local agents who do not need a show to come into contact with their customers—most of whom, indeed, they will know in person. A bright individual over here has just grasped this fact, and the general chorus of approval which has greeted his proposal to boycott provincial shows—with, perhaps, an exception in the case of two or three large cities—argues that the stand attendants will have more leisure time next year. The objection, of course, hardly applies to London shows, and the Agricultural Hall exhibition, which opens its doors to-morrow, can generally be relied upon to bring out some novelties in the car line. With this show the end of the winter session may be said to be marked, and the season of road contests straightway commences.

No American Cars in Isle of Man Events.

The Isle of Man events are this year to be held in May, commencing the Manx holiday season. Quite an interesting week's racing is provided, commencing with the Tourist Trophy race on Tuesday, May 28. This will be run off on the same course as last year and some thirty cars have already been entered, while several others are expected to rank before the list closes on May 1. No American representative is to be found among the competitors this year.

On the following day a Tourist Trophy race for motorcycles will be run off, and the Heavy Touring car race—with its fuel limitation of one gallon of gasoline for every sixteen miles of road—on the Thursday. The five miles race for the Graphic Cup on Friday will finish an interesting series of events.

The long-distance reliability trials of the Scottish and Irish Automobile Clubs always attract many entries. These popular events will be held, the latter in May and the former at the end of June. The total distance in each case is about 650 miles, and the cars are under continuous official observation till the finish of the trials. Observers of the experienced sort are employed.

M. MICHELIN INTERVIEWED "AT HOME."

PARIS, April 5.—Home again from his visit to the United States, Edouard Michelin, the tire king, has given his opinion of things in the land of the almighty dollar. Ground for the new factory is already bought, for it is not his intention to make use of an existing building, and work has already begun. A group of French engineers and foremen will be sent over, but American workmen will be employed. The American workmen are active, clever, good workers, and they do not bother with politics. "When the new factory is completed," said Michelin, "we shall avoid the 35 per cent. custom duty and pay our men the American scale for the most skilled workers.

"French workmen who are dissatisfied with home conditions should go out to the United States; the railways especially are hard pressed for men, and the most unskilled mechanic can earn \$4 a day."

Replying to a question on the American invasion of Europe, M. Michelin said he was convinced that there was no need to be afraid of it. "In the United States automobile production doubles from year to year, and still the manufacturers are unable to satisfy the home demand."

"We have been exceedingly well received in the United States; indeed the spirit of the American is such that every stranger setting foot in the country is almost immediately considered a citizen. Already we are classed over there as American producers, and no one looks upon us as invaders. Automobilists are charmed that we have come to give them good tires for their bad roads and in a short time you will see that 'Michelin boit l'Amerique.'"

WITH THE MOTOR BOATS AT MONACO

MONTE CARLO, April 5.—When motor boats were giving displays of unseaworthiness, and minor meetings were laughable failures, self-ordained prophets were predicting the collapse of the great annual Monaco auto boat meeting. A few months ago a rather diminutive entry list appeared to corroborate their dismal forecast, but to-day they have been effectively silenced. Seventy-five handsome craft bearing engines made by the most famous motor builders of France, Italy, Germany, England and Switzerland, are united in the gay open-air exhibition

are absent from the meeting, but the proportion of absentees is much lower than in previous exhibitions. Numerically there is an increase of 40 per cent. over last year's motor boat meeting. In engine construction there is little that is new, but in the designing of hulls enormous progress has been made. Not only will the racers be faster than those of last year, but they are more fitted for speedy work in a seaway than ever before. Among the 26-footers France has *La Rapiere II*, fitted with a new Panhard & Levassor motor; the *Anadyomene*, with a powerful



ART AND NATURE UNITE TO FORM AN IDEAL EXHIBITION GROUND FOR THE ANNUAL MONACO MEET.

preparatory to being launched in the blue waters of the Mediterranean for their official speed tests.

There is the usual army of sporting enthusiasts, boat builders, engineers and automobilists, a big proportion of the Paris motor world and the élite of the floating population which annually makes Monaco its winter home. For the first time the Prince of Monaco was unable to open the meeting officially, but sent his regrets, and delegated the Governor of the principality to preside over the brilliant ceremony.

The seventy-five boats are divided into four distinct classes: cruisers, racers, vedettes, and hydroplanes. The cruisers are subdivided into four classes with limited length over all and restricted cylinder area; racers are classified up to 26 feet in length and above this length; vedettes are seagoing boats intended for service in the navy or for work in estuaries and river mouths, and hydroplanes are left free from all restrictions either as regards size or engine. A few which signified their intention of competing

Delahaye engine, and *La Mouvette*, engined by Mutel. Italy has *Fiat XV, Itala*, with a 135-horsepower Itala motor, Baron de Cater's *Seasick*, with an Itala motor, hull and engine, being of last year's construction.

Public interest centers in the racers of more than 26 feet length, for the greatest speed is expected from these powerful boats. England again challenges the supremacy of the Latin races on water with a couple of Daimlers owned by Lord Howard de Walden and the *Flying Fish* belonging to Lionel de Rothschild and engined by the Wolseley Company. *Jeanette* is the solitary Italian representant. Germany has *Mercedes D. L.* and France the *Panhard-Tellier* with a Panhard motor, and *New Treffe*, owned by Thurbon and engined by Brasier. *Daimler II* has three six-cylinder 90-horsepower motors, each driving a separate propeller. She is strongly constructed of steel and is looked upon as a particularly fast craft for open sea work. The *Panhard-Tellier*, which should prove the fastest of the fleet in calm water, has two



THE ALL-CONQUERING PANHARD-TELLIER.

Panhard motors used in the Grand Prix cars of last year.

For the first time hydroplanes figure officially in the races, and although only three in number, will doubtless excite interest far in proportion of their numerical value. Comte de Lambert's craft is of particular interest from the fact that it is propelled by a 70-horsepower Antoinette engine driving an aerial propeller. There is practically no skin friction and on calm water the curious craft should be capable of enormous speed. The *Obus-Nautilus* is of quite a different type, consisting of a couple of floats united by a metal frame, one of the floats carrying the engine, the other bearing the pilot, gasoline tank and steering gear. The *Motogodille-Glisseur*, presents further distinctive features, its motive power being entirely contained at the rear, and the propeller shaft mounted on a kind of universal joint allowing the screw to be lowered into the water or withdrawn at will. The appliance is largely used in France for small boats, but this is the first time it has been mounted on a hydroplane.

Although there is less public interest in the vedette section, these boats will be examined with more curiosity by seamen than all the fast racers and luxurious cruisers, for they are the utilitarian application of the internal combustion engine to marine work. The French Minister of Marine, M. Thomson, is personally interesting himself in these boats, and has offered a special prize. They are all powerful seagoing craft, few of them fast, but all capable of putting out in half a gale of wind. Cruisers have less that calls for attention than the boats in the other classes. Engines are more protected; hulls are more seaworthy than was the case a few years ago, but there have been no radical changes.

Fast Time at Monaco Races.

Cable reports from Monte Carlo announce a number of races postponed on account of bad weather, but very fast time in those



STERN VIEW OF THREE-SCREW DAIMLER CRAFT.;

that were run. In the Championship of the Sea, the most important event of the meet, seventeen boats started. *Panhard-Tellier* got ahead from the start and maintained a distinct lead throughout the 200 kilometers, finishing in 3:33:4, or at an average of 34.77 miles an hour, beating the record by 1 hour 17 minutes. *All' Erta*, with Fiat engines, was second in 4:46:27; *Ulysee*, with Mors engines, was third; *Flying Fish*, with Wolseley engines, fourth, and the *Adèle*, with Mors motor, was fifth. *Mercedes D. L.* was the only other boat to finish in the eight hours limit. In the 50-kilometer handicap for both cruisers and racers, the *Ressac* finished first, with *Roys d'Ys* second in the cruiser section; *Mercedes D. L.* was first in the racing class, with the British boat *Flying Fish* second, and Baron de Cater's *Seasick* third. In the mile and kilometer races for craft having completed any fifty kilometers event, *Panhard-Tellier* was the fastest, covering the standing mile in 2:9. *La Rapière*, also with a Panhard motor, was second in 2:25. *Flying Fish* took third prize. By this performance the *Panhard-Tellier* secured the Prince of Monaco's cup, valued at \$2,000, in addition to \$1,000 money prize.

The closing day of the Monaco meet witnessed two races of little interest, one being a 25-kilometer contest for all boats and the other a handicap for the same distance. Owing to a rising sea only the British racer *Flying Fish*, owned by Lionel de Rothschild, was able to finish. The weather during the meet has not



SIX-CYLINDER HOTCHKISS FINISHING LONG WINTER TRIP.

been favorable and the boats have been unable to show all the speed of which they are capable. The *Panhard-Tellier* has been the victor of the meeting, showing herself fastest in both rough and smooth water. Hydroplanes have been the novelty, Comte de Lambert's aerial propeller craft attracting most attention.

HOTCHKISS MAKES 6,200-MILE TOUR.

PARIS, April 6.—Having covered 6,200 miles over winter roads, the six-cylinder Hotchkiss, piloted by M. Van Marcke, arrived again at the Place de la Concorde, in front of the Automobile Club, after an absence of fifty-eight days. The test was undertaken to prove the reliability of the car under the worst climatic conditions and over the most difficult roads of France. It must not be supposed that the run was a pleasure trip over billiard-table roads, for the car negotiated the Pyrenees, the Alps, the Vosges mountains, the hilly central district of Auvergne, and the wild roads of Brittany and Finistere. The car was equipped with a side-entrance double-phaeton body and all touring requisites, and carried four passengers. Michelin patent dismountable rims were employed and gave every satisfaction throughout the long test. The illustration shows the arrival of the car on the Place de la Concorde, where the tourists received a hearty welcome from friends and interested persons. Madame Van Marcke, on the right of the car, does not appear to be at all displeased at the return of her husband. THE AUTOMOBILE Paris photographer is seen standing on the right.

A. L. A. M. TAKES UP TIRE STANDARDIZATION

FOLLOWING up the good work that has been accomplished in other essentials, the Mechanical Branch of the Association of Licensed Automobile Manufacturers is now about to turn its attention to the important matter of standardizing tire sizes and weights. As an outline of what is to be done the appended information has been issued and will be found interesting reading:

Tires and their standardization, a problem that has confronted the automobile industry from its inception, is to be the next big work of the Mechanical Branch of the Association of Licensed Automobile Manufacturers. The success of the association's screw standard, its standardized spark plug, its various experiments in metals and oils, and its many educational engine tests will be followed by a series of tire tests, and adoption of standards which will be of material advantage to all motorists and manufacturers.

The tire situation is one that for a long time has not only bothered automobile manufacturers and users, but the tire makers themselves. The peculiar position subjected to tire selection and the number of people through which it had to pass rendered it very confusing. The tire maker, rim maker, automobile manufacturer and consumer. The lack of standard methods as to the quality and size resulted in the tire makers becoming more or less uncertain of the conditions to be imposed upon them by the users.

Under the direction of the Tire Committee, the Mechanical Branch's experts have made several tests in the quality and size of tires to determine what specifications will be adopted and standards recommended which will call for uniformity throughout.

Comparative Test for Quality.

Tests show that the part of the tire nearest the ground and what is known as tread rubber, to give the best results should be of compound rubber, as pure rubber would not stand the continuous friction caused by coming in contact with the road surface. Near the center of the tire comes the "breaker strip," made up of two or three layers of canvas separating the tread from the next layer of rubber or "cushion stock." The "cushion stock" is usually of the highest class rubber, being only slightly compounded; the next layer towards the center is a five or six-ply fabric, frictioned inside and out. The degree of compounding can be obtained by the specific gravity of the rubber, it being known that the specific gravity of pure rubber is between .950 and .980. The ash, after burning the rubber at a low degree of heat, represents the degree of compounding, independent of the sulphur used for vulcanization. To determine the strength, a strip of rubber is cut from each of the different layers of qualities in the tire, 1-4 inch wide and 1-8 inch thick. One end is gripped and weights are then added to the other end until the strip breaks. A Para rubber shows high strength, and the cheap rubber low strength. In determining the elasticity a similar strip is cut from the tires, 1-4 inch by 1-8 inch, and a measured length of 10 centimeters is taken. The strip is then stretched between nails on a board until the 10 centimeters length becomes 30 centimeters. It is kept in this position for 24 hours, then released, and 10 minutes after release the permanent set

taken. A good rubber has small permanent set; a poor and a cheap rubber has much permanent set.

Relative Size of Tires.

Considerable discussion has been given to the relative merits of different size tires on front and rear wheels. The size of tires, of course, depends on the weight of a car and its gearing. Many manufacturers have found it to advantage to use a smaller diameter tire on the front wheels than on the rear, and careful investigation seems to prove this to be wise. First, it is much easier to steer, it having a smaller friction area on the ground surface, this makes the wear on the tire, on the whole, considerably less, with chances for punctures decreased. It has less weight in itself and is better proportioned to the weight of the car, which is, of course, heavier in the rear. For high-powered cars, that is, cars required to attain a speed of from 40 to 60 miles an hour, the smaller the diameter of the front tire, the less the danger in case of blow-out or puncture. S. F. Edge, a noted English driver, has made several tests to determine the relative shock caused by punctures, of different size front tires, with the result that with a 3- or 3½-in. tire, a car going 50 miles an hour would be thrown not over 6 or 8 feet, while with an explosion of a 5-in. tire, it would be thrown from 30 to 40 feet. Economy and safety call for a smaller diameter front tire. Many do not think it an economy to carry two size tires, but in the long run it will be found more advantageous. For racing purposes a French driver will not use over a 90-mm. tire on the front wheels.

Adoption of Universal Size.

One of the first recommendations of the Tire Committee of the Mechanical Branch was the elimination of so many sizes of tires, that is, the wheel sizes. Up to the time the Mechanical Branch took hold of this matter, there were 23 sizes of tires in the market, many of which were incapable of doing the maximum amount of work required, owing to their being of wrong proportion, not only for the weight of the car, but the area of the ground surface. Experiments by the Branch have resulted in a reduction of this number and the adoption of 11 sizes:

28x3	30x3	30x3½	32x3½	32x4
34x3½	34x4	34x4½	36x4	36x4½
		36x5		

Uniformity in Rims and Felly.

A great difficulty that has confronted the automobile manufacturers is the various sizes of rims on the market, thus causing considerable rim-cutting to tires. Many of the rim-makers of single-piece rims had a uniform size diameter and depth of clinch, but not all. Through the efforts of the Branch, the rim-makers have all agreed to a standard size rim, to be inspected and passed by the tire-makers, who will guarantee any tire bearing the rim associations stamp.

Tests and experiments are being made for the standardization of quick detachable tires and demountable rims, results of which, when completed, will prove of considerable advantage to all.

STANDARD FORMULA FINALLY TO BE ADOPTED

AT last the figuring of horsepower has come in for attention, the Mechanical Branch of the Association of Licensed Automobile Manufacturers having taken up the question of establishing a standard formula at its meeting last week. The standards suggested are to consist of a brake test, in connection with a formula to be suggested by the Test Committee. Two units are to be used, the lower being the actual rating from the brake tests, as computed from an indicator at 1,000 feet per minute piston speed, and the higher number to be the maximum horsepower developed from superior workmanship or the results of a better type motor. For example, in a 20 to 24-horsepower motor, the 20 would be the actual horsepower at 1,000 feet per minute piston speed and the 24 the horsepower which would be developed when not under normal conditions.

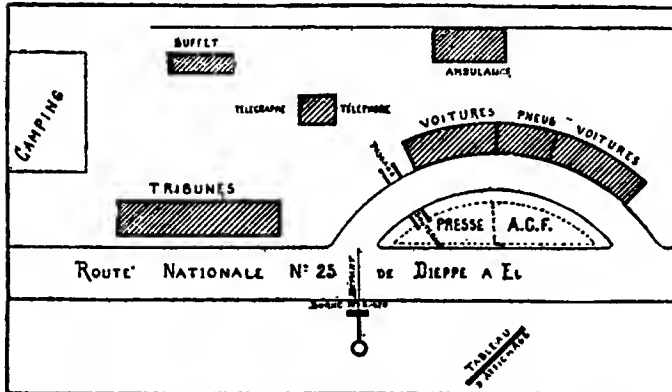
A discussion of alcohol-acetylene as a fuel followed. The growing need of a substitute for gasoline was realized, but

whether alcohol-acetylene combination would supplant the present fuel supply is a problem yet unsolved. Thos. L. White, of Barker & White, exponents of the new fuel, gave a most interesting illustrated talk on the subject. Mr. White predicted that by September 1 alcohol could be obtained at a figure less than 20 cents per gallon, and that in certain places and in quantity carbide could be purchased for this purpose at one cent per pound.

A business meeting of the branch followed the regular session, and three new members were added to the Tire Committee, in order to assist in the furtherance of the standardization of tires which they have adopted. The new members are S. D. Waldon, Packard Motor Car Company; R. B. Jackson, Olds Motor Works; E. F. Russell, Locomobile Company of America. Owing to the amount of work which is being done by the Test Committee it was thought advisable to add another member to this committee, and J. G. Utz, of the Autocar Company, was named.

GRAND PRIX PREPARATIONS.

PARIS, April 6.—Apostles of the simple life will be delighted to hear that there will be camping facilities at the Grand Prix. Last year the same happy state existed on the Sarthe Circuit, but as the simple livers had to erect their own tents, after clearing the land of timber, cook their own food and roll their own beds, most of them preferred the voluptuousness of an old-fashioned



PLAN OF THE GRAND PRIX GRAND STAND NEAR DIEPPE.

feather bed and a diminutive bowl for morning ablutions. This year conditions will be changed; the Automobile Club of France having decided to rent a large plot of land close to the grandstands, cause a contractor to prepare it, erect tents, and provide meals at a charge which, if not exactly those of a Salvation Army shelter, will be sufficiently reasonable for most of those who have responded to the back-to-nature call. Within easy walking distance is the seashore, so that to the delights of camping can be added the pleasures of sea bathing.

Trial runs continue without interruption on the circuit, nearly every French driver engaged in the Grand Prix having made close acquaintance with the triangular course. This week the full Renault team, with the machines to be used in the race, have done a large amount of speeding under the personal direction of Louis Renault. Szisz declares himself thoroughly satisfied with the course and declares that it will be exceedingly fast when the intended improvements have been carried out. During his speeding Szisz killed a number of crows.

The sketch reproduced herewith shows the arrangement of the grandstands, the tire and automobile stations, the loop road, and the score board. It will be noticed that an island is formed between the loop road and the main track, to be united with the outside of the circuit by a tunnel. On the opposite side of the road will be the popular stands and the scoring board. Grand Prix racers will be started at the point marked on the main track, and the Sporting Commission machines will be sent away later on the loop track.

OLDSMOBILE "MUDLARK" DOES 2,000-NON-STOP.

PHILADELPHIA, April 15.—At 8:44 o'clock last Tuesday morning, having been 71 hours and 44 minutes on the road, the Oldsmobile *Mudlark* completed the 1,000-miles non-stop run on which it started the previous Saturday morning. At that time the motor was running so quietly and rhythmically that Manager G. Hilton Gantert, of the Motor Shop, who had charge of the test, decided to continue for another thousand miles. The second leg was completed on Thursday night, and still the *Mudlark's* motor was chug-chugging away as merrily as at any stage of the long journey. But the human element in the test—the operators—were "all in." And reluctantly Manager Gantert gave the word to "stop 'er." But after shutting off the spark, just to show that the motor was as full of life as ever, Driver Folbarth, the Oldsmobile factory expert, started it up a half dozen times on compression. And then all hands went home to sleep.

NEW YORK AUTO CAB SERVICE.

Once more New York is promised an automobile cab service. A new company has recently been organized with the title of the Motor Carriage Company, capitalized at \$1,000,000, under the presidency of G. Winthrop Sands. The New York Cab Company will work in connection with the new organization and will be responsible for the business side of the scheme. The intention is to place three hundred French gasoline cabs, of the type now in use so successfully in Paris and London, in service in New York for private trade only. We are informed by the management of the New York Cab Company that there is no intention to use the taximeter system, but to apply the gasoline cabs entirely to the class of work for which their horse vehicles are now used. G. Winthrop Sands sailed for France this week to make final arrangements with the firms contracting for the supply of the cabs. The vehicles selected will be from the Chenard & Walcker factory, and the Unic make from the Georges Richard factory, and the first delivery will take place about August. The initial batch of machines will have bodies built in Paris by Védrine, but later it is intended to import the chassis only and fit bodies in New York.

The Chenard & Walcker cab has a 16-20-horsepower four-cylinder engine with cylinders cast in pairs and interchangeable mechanical valves on opposite sides. The machine is at present unknown in the United States, but in Europe it has won considerable distinction on account of its reliable construction coupled with low price. Simplicity has been sought in every part, and the machine made as easy to drive and care for as possible—an important feature in an automobile intended for public service. Ignition is by high-tension Simms-Bosch magneto mounted in front of the engine and gear driven off the exhaust camshaft; transmission is through sliding gear, three speeds forward and reverse. Final drive is through a special type of rear live axle.

BROADWAY TO BE RESTORED TO VERDANCY.

As a result of Governor Hughes' signature appended to the Saxe bill, providing for the rehabilitation of the small parks in Broadway, the latter became a law and New York's most picturesque thoroughfare, which has been denuded of every sign of verdure on its island parks ever since the building of the subway, will again blossom forth. The broad strips between the car tracks that did so much to make Broadway shady and cool in the heat of summer, have been eye sores ever since the work of construction on the underground road was commenced. They have been "nobody's dog" from that day on and served as a dumping ground for all kinds of rubbish. Under the new law they will be placed in charge of the Park Department.



A "FULL-JEWELLED" CORBIN AND ITS MANUFACTURER.
Maxwell S. Hart, vice-president and treasurer of the Corbin Motor Vehicle Company, at the wheel.

DURYEA TO BE CONSULTING ENGINEER.

It seems fitting that Charles E. Duryea, who can rightfully lay claim to the title of being the pioneer automobilist in this country, and who has long been a moving spirit in the American Motor Car Manufacturers' Association, should be appointed to the post of consulting engineer of that organization. Than Mr. Duryea there are few engineers in this country who are better fitted for the position. His experience in making gas engines dates back to 1886, and he first devoted his attention to the automobile in 1891, or almost a decade before the motor vehicle began to loom up as a serious factor in daily life. His victories in the *Times-Herald* race in Chicago, the *Cosmopolitan* race in New York City, and the long-distance race in England in 1896, when his car covered 52 miles and finished an hour ahead of a field representing the best that Europe had to offer, as well as finishing a close second in the Belgian race a few months later, are events that will go down into history. He first began to make cars for the market in 1895. The American Motor Car Manufacturers' Association now consists of 41 members, all of whom will be able to benefit by Mr. Duryea's ripe experience in the field of gas engineering as applied to the automobile. How valuable this makes him is apparent when the number of salient features of the present-day auto due to his creative genius is recalled.



A RAMBLER TOURING PARTY IN FRONT OF THE ALAMO.
The historic structure where Davy Crockett heroically died defending Texas liberty, a magnet for local autoists.

FUEL TEST GIVES INTERESTING RESULTS.

Under somewhat more favorable conditions and using a combination of gasoline and kerosene on one of the cars instead of kerosene alone, the fuel test undertaken by the Maxwell Motor Car Company from New York to Boston last winter was repeated on the 6th, when three cars of the same maker were run from Trenton to Atlantic City, N. J., a distance of 103 1-2 miles. Two observers were carried in each car. One of the cars used denatured alcohol, another gasoline and the third a combination of kerosene and gasoline, the different fuels being carried in separate tanks and fed in the proportion of three to five.

Trenton was left behind at 10.25 A. M., the cars being driven by H. A. Grant, using alcohol; Charles Fleming, the combination fuel, and Harry Caywood, gasoline, the first-named drivers having acted in the same capacity on the previous run. On weighing in at the end of the run the cars with passengers and baggage up tipped the scales as follows: Alcohol, 2,560 pounds; kerosene, 2,470 pounds, and gasoline, 2,250 pounds, the fuel consumption having been 14 1-2, 8 and 7 gallons, respectively, the combination car using 3 of kerosene and 5 of gasoline.



DAVID JAEUNG, BOSTON'S LICENSED CHINESE CHAUFFEUR.
Employed by the Linscott Motor Company, of Boston, and is one of its most expert machinists. He is driving a 1907 Reo.

BUFFALO TO HAVE AN AUTOBUS LINE.

BUFFALO, N. Y., April 15.—Buffalo is to have an automobile omnibus line. It will not only operate in the main thoroughfares of this city, but will run to Niagara Falls and surrounding towns. Articles of incorporation of the Auto Transportation Company were filed in the County Clerk's office last week. The company is capitalized at \$100,000. Directors are Blinn Yates, Buffalo; Robert W. Day, Buffalo; Fred B. Eberhardt, Buffalo; Uriah L. Upson, Orchard Park; George J. Klopp, Hamburg. Different routes have been planned in the incorporation papers. Aside from Buffalo's main streets, the lines will extend to Niagara Falls, Tonawanda, Lockport, and towns east and south.

RULING FAVORABLE TO THE CONTINENTAL.

WASHINGTON, D. C., April 15.—Treasury Department regulations of April 28, 1905, providing for the allowance of drawback on Continental tires, imported by the Continental Caoutchouc Company, of New York, and exported with valves of domestic manufacture fitted thereto, have been extended to cover the exportation of tires having outer cases of leather, imported by said firm and fitted with domestic valves, in accordance with the company's sworn statement filed with the collector of customs at New York.



MISS ROSE STAHL IN HER NEW 26-H.P. DRAGON.
The heroine of "The Chorus Lady" is an ardent automobilist as well as a charming comedienne.

THE LATEST NEWS FROM TIRETOWN.

AKRON, O., April 15.—Akron tire manufacturers report a wonderful increase in business this spring, and all of them are taxed beyond or to their factory capacity. The Diamond Rubber Company has just let a contract for a new five-story annex of concrete and steel construction extending from one street to another. The Firestone Tire & Rubber Company has added several new lines, so that the products now include tires for all standard rims. The company will double its force of workmen in a few months. The Goodrich company has also increased its capacity greatly.

The Firestone company has just put out a new tire known as the Dual tread, which it is claimed will entirely prevent skidding. It is a large tire and is intended for use on heavy motor cars. The tire has two ridges of rubber projecting from the surface of the tire and running longitudinally, one on each side, their outer edges being three inches apart. These ridges run about a half inch from the body of the tire, and by their action prevent skidding. The tire was invented by a workman in the plant, and is entirely a Firestone product.

J. F. Singleton, advertising manager of the Firestone company, has issued a booklet containing instructions for the care of solid motor tires, and it contains information from an expert which has not yet been published.

Charles W. Harris, formerly with the Consolidated Rubber Tire Company, but recently manager of the Chicago branch of the Pennsylvania Rubber Company, has been in Akron closing a contract with the Adamson Machine Company for a large number of molds to be used by the American Cellular Tire Company in connection with the tire which that concern is about to put on the market. This new cellular tire is neither solid nor pneumatic, and those interested in it claim great possibilities for it. It does not puncture, so that no extra shoes or tubes are required to be carried nor are tools or pumps. It is also claimed to be fully as resilient as pneumatics and to weigh little less. The American Cellular Tire Company will not manufacture the tire, but expect to license it. One Akron company is already negotiating for it.

COLUMBIA CO.'S AUTOMATIC ELECTRIC BRAKE.

Not the least interesting feature of the Columbia gasoline-electric chassis that is being specialized by the Electric Vehicle Company, Hartford, Conn., is the provision of an auxiliary electric emergency brake made possible by the unique transmission employed. A 45-horsepower gasoline motor direct connected to the revolving field of an electric generator with a dragging or slipping armature is the power plant and elastic clutch of this car. Mounted on the armature shaft of the generator, which runs back to the axle, is the armature of the stationary field motor, into which all the current produced by the slip of the generator field is retransformed into mechanical energy and aids in driving.

The auxiliary electric emergency brakes are embodied in this stationary field motor, and by simply pulling the controller handle to the first rear notch on the control this field and its armature are short circuited and tend to turn as one. As the field is rigidly fastened to the frame of the car, this is impossible, and the driving mechanism locks with a slight slip. The feature which appeals strongly to the more careful autoist who tours hilly country is the automatic retarding brake, which acts in the capacity of the sprag or ratchet. In this automatic sprag is found probably the only brake in existence which goes into operation the moment the car begins to travel backward without any assistance whatsoever from the driver. It is caused by the motor armature on the driving shaft generating current as soon as the armature commences to revolve backward, thus causing a powerful brake, with a slight slip, which will hold as long as the wheels have traction.

Peoria, Ill.—Two new garages now under construction in this city are nearing completion. One is located on East Pine street, and the other on North Main street.

PITTSBURGH'S SHOW WAS RESULTFUL.

PITTSBURG, PA., April 15.—A success. That sums up the opinion of the first automobile show in Pittsburg. It closed last Saturday night in a blaze of social brilliancy. The show was still more of a success in point of sales. Over \$400,000 worth of cars were actually sold during the week. The Central Automobile Company sold 20 Reo cars and two Grout cars. J. G. Warwick & Co. sold 29 Jewel cars. These were two of the best records made, but only two. There were a dozen agencies which sold half as many cars as they have in any one month of this season. The sales continued up to the very hour of closing, the last purchase, a Winton car, being made after 11 P. M. Saturday by the Hon. James Francis Burke, Congressman from Pittsburg, as a present to his wife. Instead of the show being a loss to exhibitors it made them a lot of money in direct sales as well as in the splendid advertising which they received from it.

The show was not without its features. One of these was the exhibit of the Standard Automobile Company. It had to borrow cars from its customers to make a showing, as all its Packards and Franklins were sold before the show opened. Another feature of the week was the big hit made by Guenther's orchestra in the new "Pittsburg Automobile Association March."

The show was handicapped by the refusal of the Motor and Accessory Manufacturers to grant a sanction for the exhibit of accessories and parts manufactured by members of the association. Strong pressure was brought to bear to secure this permission, but it was withheld. Pittsburg dealers are still angry.

An automobile show in Pittsburg for next year is an assured fact. If a "first show," coming the same week as the Carnegie Institute festivities and in the midst of weather that would drive anyone but an enthusiastic automobilist indoors, can be made such a success as last week's event, it is believed that with this experience Pittsburg can have next year a show that will be international in its features. The show will likely be held earlier than this year. The committee who managed this show consisted of W. H. LaFountain, Thomas I. Cochrane, and Earl Kiser.

A STAGE FAVORITE'S USE OF AUTOS.

BALTIMORE, April 12.—That autos are taking a place on the stage will be shown next week at Ford's Opera House. Miss Jessie Busley, who is to play *Nance* in "The Bishop's Carriage," has decided to make her escape in a Baker electric. Miss Busley gained much notice by traveling the Pacific Coast in automobiles. She went from San Francisco to a number of other cities, carrying both company and baggage in autos.



THE "DIP OF DEATH" LADY IN HER AMERICAN MORS. — A feature of the Barnum & Bailey Circus, at Madison Square Garden. Mrs. Isabella Butler is the heroine of the act.

BRIEF ITEMS OF NEWS AND TRADE MISCELLANY

A total of 18,889 automobiles are in use in Massachusetts according to figures just published by the registration authorities at Boston.

Additions have been made to the Providence branch of the Angier Company, at 9-11 Dorrance street, by the incorporation of the adjoining store. W. B. Richards, formerly of New York City, is the branch manager.

Among the orders received last week for Truffault-Hartford shock absorbers was one for fifty sets from Julius Bindrin, the Bedford avenue dealer in Brooklyn. This year is expected to be a record one for the pioneer device.

Information has been received from Michelin headquarters in France by E. Lamberjack & Co., sole American agents for Michelin tires, that Panhard, Renault, Fiat, Bayard-Clément, Itala, De Dietrich, and Darracq racing machines will use Michelin tires in all national and international races in 1907.

Extensive improvements and enlargements have been made to the wood-working plant of Miller Brothers, of Amesbury, Mass. The firm, which has been engaged in body building for eighteen years, had an output of 2,500 bodies last year, and with the increased facilities will turn out 4,000 bodies in 1907.

The Locomobile Company report that they have shipped from the factory at Bridgeport over 60 per cent. of the 1907 output, and that their sales department has never been in such a healthy condition—a statement which, although general, must be regarded as significant. The record shipment was made recently, \$60,000 worth of Locomobiles leaving the factory in a single day.

Harry Dunn, president of the Fisk Rubber Company, of Chicopee Falls, Mass., is in New York in order to pass on the final details of the building which his company is erecting at Fifty-fifth street and Broadway. The plans for this building are very elaborate, as it will be used as a distributing center for much of the Fisk Company's business. Owing to rapid growth in popularity of the Fisk detachable tire, Harry Fisk, the treasurer of the company, will devote his personal attention to the local branch.

If the intentions of private owners are to be counted on, Columbia cars will figure conspicuously in the big motoring events on the 1907 calendar. Two Columbias are already entered for the American Gold Cup Tour, and assurances are given that at least four machines of this make will participate in the Glidden Tour. Charles F. Barrett, who last year finished the tour with a perfect score in a 24-horsepower Columbia, is undecided whether he will enter the Glidden Tour or the European event.

Amesbury, Mass., is to have a large factory devoted exclusively to the building of metal bodies. A company has been formed under the title of the Amesbury Metal Body Company, and has secured a large, centrally-located factory with 20,000 square feet floor area, which is now being remodeled and machinery installed. The plant will be in operation at the beginning of June. The heads of the new company are J. Albert Davis, formerly of Gray & Davis; James H.

Walker, of Walker Carriage Company; John Foster and Fred England.

Thomas Henderson, vice-president of the Licensed Association of Automobile Manufacturers and of the Winton Motor Carriage Company, has returned to Cleveland from a month's trip through the far west. "I was astonished at the remarkable prosperity of the western country, particularly of the Pacific coast section. San Francisco, now in the making, will be greater and better than ever before. There are wonderful business opportunities on the coast for young men of ability, especially in the sale of automobiles. Motor cars have so emphatically demonstrated their usefulness under severe conditions, in cities, country and mining camps, that sales are made to far western buyers with considerable less effort than in the east, where details rather than general practicability wield an influence out of proportion to their importance. Western buyers lack nothing in shrewdness and they demand the best cars, but what they demand above all else—in their level-headed way—is power and durability."

NEW AGENCIES ESTABLISHED.

The Craig-Toledo agency for Northern California has been placed with the D'Arcy-Scott Company, 524 Golden Gate avenue, San Francisco. This concern also represents the Dragon car.

Two new distributors have been appointed for the Cleveland by the Cleveland Motor Car Company, as follows: C. W. Poole, 714 Sixth avenue, Seattle, Wash.; Van Automobile Company, 4706-4710 Washington avenue, St. Louis.

The Angier Company, of Boston, has opened a branch for the sale of marine engines and motor boats at 31 Central Wharf, that city, and has secured the agency for Bridgeport motors and Ferro engines. John R. Parker is the new manager.

PERSONAL TRADE MENTION.

George S. Atwater has resigned the position of sales manager with the Atwood Manufacturing Company, of Amesbury, Mass.

C. L. Lawrance, of the B-L-M Motor Car Company, will sail for Europe April 19 to visit the Krupp steel plant and other European institutions in the interests of his concern.

Otis R. Cook, formerly of Cleveland, and for a dozen years traveling agent for the B. F. Goodrich Company, has taken a position with the Firestone Tire & Rubber Company, and will travel between Buffalo and Toledo.

Theodore Goetz, for some years connected with the R. E. Dietz Company in its automobile lamp department, has joined the selling force of the Witherbee Igniter Company. W. W. Robinson has joined the engineering force of the Witherbee Company as mechanical engineer.

E. C. Angell has resigned as general superintendent of the Jones Speedometer to accept the general management of the Winchester Speedometer

Company, in which corporation he has a large interest as a stockholder. Mr. Angell has been long known to the manufacturing world.

John J. Coakley, a former Boston newspaper man, well known as a writer on automobile topics, has taken charge of the publicity and advertising department of the Babcock Electric Carriage Company, of Buffalo, N. Y. C. H. Tyler, for six years eastern representative of the National Motor Vehicle Company, has joined the selling force of the Babcock Company.

Charles Schmidt, the designer of the 1907 cars manufactured by the Peerless Motor Car Company, of Cleveland, O., sailed on *La Lorraine* April 4 for a trip abroad. Mr. Schmidt expects to be gone about six weeks, and will visit all the important European automobile manufacturers, renewing acquaintances and studying new foreign methods of construction and materials used.

James K. Christie, who recently withdrew from the firm of Palmer & Christie, importers, has joined the forces of the American Locomotive Automobile Company, his position being designated by General Manager Joyce as "manager city sales." Mr. Christie's identification with the automobile business dates back to 1900, when he was selling steamers. He has been in the importing line since 1904.

H. A. Williams, 1459 East Eighty-eighth street, Cleveland, O., inventor and formerly manager of the Williams New Electric car and New Gasoline car, has severed his connection with the Williams Electric Vehicle Company, the reason given being a stockholders' disagreement. Mr. Williams expects to organize a new company or join some other concern which will manufacture his electric car.

NEW BUSINESS ENTERPRISES.

Charleston, S. C.—The Automobile & Marine Motor Company has been incorporated by N. S. Lea as president, J. C. D. Schroeder as secretary, and W. Orrin Bee as manager. The company has the agency for the Ford and the Detroit, and will carry a complete line of sundries. Located at 9 George street, the company occupies a two-story building, 40 feet wide by 160 feet deep.

New York City.—The Imported Car Repair Company will install in the Motor Mart at Broadway and Sixty-second street a machine shop for the purpose of repairing the highest grades of automobiles. A specialty will be made of magnetto work. The officers of the company are: President, M. S. Gilmer; secretary, R. B. Whitman; treasurer and manager, J. T. Gilmer; chief mechanic, C. W. Adams.

Goshen, Ind.—Leading business men of this city have organized the Oswald Motor Company for the purpose of manufacturing gasoline automobile and marine motors, and will place on the market single-cylinder and double-cylinder types and also a 40-horsepower motor. The officers of the corporation are as follows: President, Elmer Newell; secretary, Charles Shoup; treasurer, O. M. Curtis; sales manager, W. T. Miller.

St. Louis, Mo.—The D. L. G. Auto Company, of 3032 Olive street, is being organized by A. L. Dyke to manufacture the Dyke-Leibert & Givens six-cylinder "unit power plant" automobile. The features of the new car as announced are the improved unit power plant, consisting of six-cylinder engine, 4 by 4 1-2, with multiple disk clutch and selective transmission housed in unit, also the absence of coil batteries, and high-tension magneto used instead. The company expects to have a model completed in sixty days, and a run will be made from St. Louis to New York without the use of battery or coil.

Jersey City, N. J.—The Acetylene Specialty Company, with a capital stock of \$100,000, has been incorporated to manufacture small acetylene cylinders (Parisian style) for automobiles and other purposes under the name "Stereo;" also a new high candlepower acetylene incandescent burner for auto lamps. The incorporators include Eugene Bournonville, ex-chief engineer of the Commercial Acetylene Company, and E. Thomey-Cavalleris, president of the Acetylene Gas Illuminating Company, of New York. The factory will be located in this city and the general offices of the company at 105 Walker street, New York City.

NEW TRADE PUBLICATIONS.

Air-cooling is naturally the theme of the Frayer Miller 1907 catalogue, which has just made its appearance. For the coming season the firm has produced a 50-horsepower model of long wheel base and seating accommodation for seven passengers. This is fully described in the catalogue and the distinctive features of the Frayer-Miller system of cooling by a blast of cold air is explained by text and drawings. A copy of the booklet can be obtained from the Oscar Lear Automobile Company, Columbus, O.

Though they are both self-propelled, there is not much similarity between a road roller and an automobile. Yet road rollers make good roads; good roads make automobilists happy. The good road makers of the Monarch Road Roller Company, Groton, Tompkins County, New York, are presented to the public in a new catalogue issued by that body and containing many half-tone illustrations and much descriptive text. Street cleaners, water wagons and portable engines also find a place in the new publication.

"Expert Testimony" will be read with interest by all automobilists. Extracts from the reports of the correspondents of the leading automobile journals in America on the annual automobile shows of London, Paris and New York are given in the book, each one being followed by a few words of text showing how the Lozier machines conform to the best ideas to be found in these great exhibitions. A word to the Lozier Motor Company, Fifty-fifth street and Broadway, will bring "Expert Testimony" to any who desire it.

Artistically designed, well printed and elegantly bound, the new Rambler catalogue is in every respect a pleasing production. Panels and vignettes of those wayside scenes that every true automobilist is always delighted to find, contrast harmoniously with the half-tones of complete cars, chassis and mechanical parts of the 1907 Rambler output. There is plenty of text also, and

not a feature of the machine but is thoroughly described. The catalogue can be obtained from the Thomas B. Jeffery & Company main office at Kenosha, Wis., or from their numerous agencies.

"Instructions and Directions for Operating the Great Smith Car," published by the Smith Auto Company, Topeka, Kansas, is a voluminous work of 64 large pages, containing a quantity of useful information. Dealing first with general considerations of the automobile, the work passes progressively through the entire mechanical field of the internal-combustion engine, clearly explaining many of those principles without a knowledge of which it is almost impossible to successfully operate an automobile. A separate chapter deals with the practical operation of an automobile under all conditions, from cranking the engine to difficult driving on the heaviest of roads. Common ignition troubles, attention to tires, grinding valves, attention to lubrication, water circulation and other matters which every automobilist must learn are among the subjects on which the instruction book gives advice.

Manufacturers have learned that a large amount of a customer's satisfaction lies in his or her ability to operate and care for a motor car properly. The Peerless Motor Car Company has issued a most interesting and attractive pamphlet, "The Peerless Instruction Book," which explains in a clear and concise manner the detailed construction and operation of this company's cars. Of course, it is impossible for any book to solve in advance all motoring problems that an operator will encounter. But this description and the general hints contained in it will give a new operator a valuable foundation on which to build further knowledge of the more minute details of a car, and at the same time form a safeguard against possible costly errors in care and operation. The book starts with a description of the lubricating, gasoline ignition and cooling systems, then giving description of the motor, transmission, brakes, etc., and closing with some valuable hints on proper operation, common sources of trouble and, lastly, with a list entitled "A Few Don'ts."

INFORMATION FOR BUYERS.

Storage Battery Charger.—The object of the storage battery charger just put on the market by the A. W. Fisher Company, of South Bend, Indiana, is to keep an ignition storage battery charged while the engine is running. It is installed on the motor, to be driven either by belt or by friction pulley against the flywheel, and generates current which is stored in the battery, taking the place of that which is being used by the coils, thereby keeping the battery charged constantly. The plan contemplates using current from the battery at all times, the charger simply supplying what is needed to keep the battery charged. This amount is arrived at in the construction of the machine, the output of the armature not being sufficient to injure the battery in any way, but enough to take care of the consumption by the coils. It is provided with a patented mechanical automatic circuit-breaker, or switch, so constructed that it breaks the circuit between the battery and charger when the speed falls below that at which it is generating current, and prevents the current from the battery leaking back through the machine and exhausting the

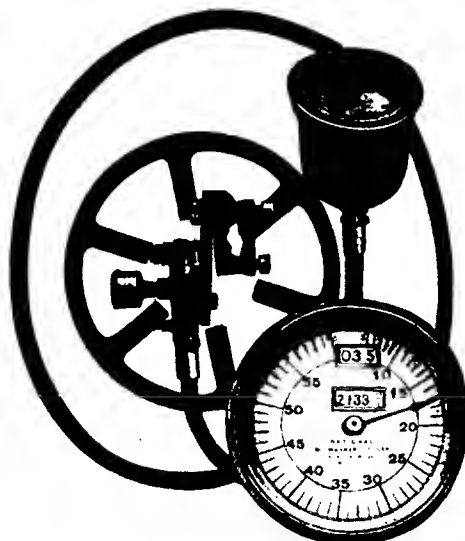
battery. This cut-out, which is a part of the charger, operates entirely by speed and does not depend upon the electrical output of the generator. The entire machine weighs but 12 pounds and measures



FISHER'S STORAGE BATTERY CHARGER.

8 1-2 inches long by 5 inches high by 4 1-2 inches wide. Any standard 6-volt battery may be used in connection with this charger. The machine is sold under a positive guaranty that it will keep an ignition storage battery charged and ready for service at all times.

National Speed Indicator.—Driven from the road wheel by a flexible shaft in the usual manner, the National speed indicator is actuated by a vertical ball governor mounted in ball bearings and working against a balanced spring, this principle insuring a uniform scale and accurate reading. The scale is nine inches long and is claimed to be the longest on the market; the needle is as steady as a clock hand and the face so open that it can be read in a very dim light. All the moving parts are of steel,

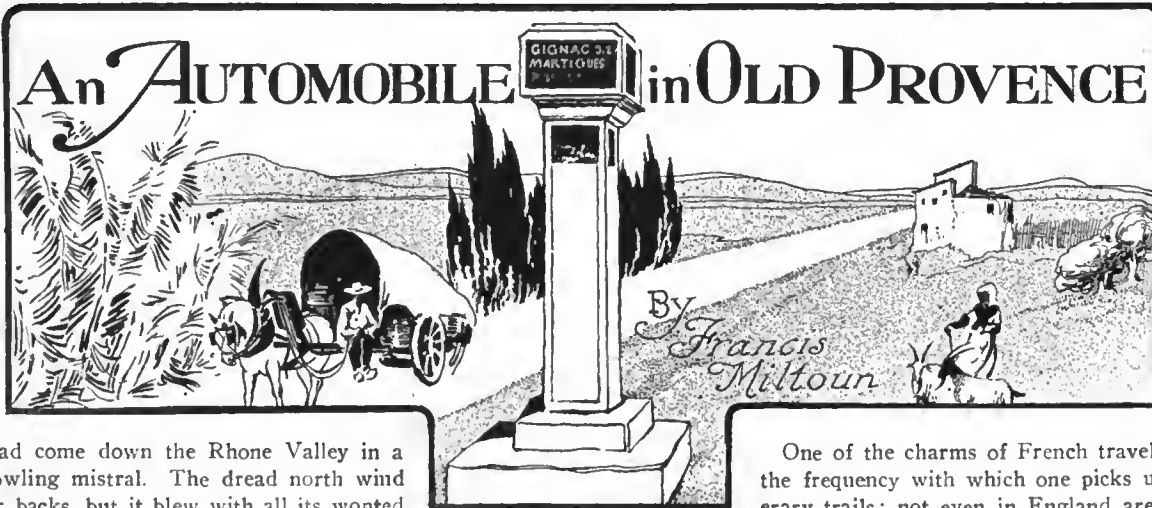


NATIONAL INDICATOR AND FIXTURES.

the shaft cases are of flexible brass lined with a special steel lining, and all attachments are made strong to stand hard

A Veeder odometer inclosed in the case and reading through the dial gives the season's mileage; there is also a resetting trio register for 100 miles and repeat. The National indicator is manufactured by William Herbert Jones, Newton, Mass.

THE AUTOMOBILE



WE had come down the Rhone Valley in a howling mistral. The dread north wind was at our backs, but it blew with all its wonted fierceness and gave a good five kilometers an hour more than our normal speed, though curiously enough when we had come up-river against it on one occasion our average of forty kilometers—which is not bad for a light-powered automobile—fell to twenty-five, with everything pulling well at that. The plague of the mistral is classic throughout all Provence, and there is a saying among the habitants of old that all Provence needed to make it a veritable Eden was the abolition of the Parlément, the suppression of the mistral, and the damming or drying up of the river Durance, which of all the enigmatical and torrential rivers of the world is the most unstable and fickle. Madame de Sévigné in her time was a good observer of things as they were, and she passed many strictures on the topographical features of France which have been very useful to us writers who have followed after. She called the mistral an unchained devil, and she knew, for it blows and howls around the Chateau de Grignan in an inconceivable manner, as it does through all this otherwise delightful region, when once it arises in its wrath.

Automobilists to the south of France had best come down by the Rhone and return north via the Pyrenees if time will permit. It is the only way to be sure of avoiding one of the stiffest winds that blow for a matter of 300 kilometers.

We were bound for the Italian frontier, and did not propose to linger by the way, but the spell of Provence was upon us and, after leaving Valence, and realizing the full force of the adage, "*A Valence le Midi commence,*" we fell into that languor of *laisser aller*, which comported little with scorching off kilometers at *toute vitesse*. Without question Provence is the true land of *la cigale*.

Before we knew it we were on the trail of Daudet's Tartarin and Dumas' Monte Cristo, and the hero-worshipping instinct of the literary vagabond came to the surface with such rapidity that we could not down it and so decided to make a little literary pilgrimage forthwith.

One of the charms of French travel by road is the frequency with which one picks up these literary trails; not even in England are they more numerous nor e'en so romantic.

A New Motive for Automobile Tourists.

Here's a new motive for automobile tourists; let them follow up some previously outlined literary or, for that matter historic, itinerary and get a pleasure and edification out of touring that they knew naught of when they were hying from one resort to another and stuffing themselves with imitation Parisian table d'hotes and wine at five francs the bottle and plus; when they could do far better, from every point of view, in the small towns through which they passed and didn't even know by name.

Old Provence is full of literary landmarks. Alphonse Daudet, Frederic Mistral, Félix Gras, and Dumas père have left the footprints of their characters as thick as falling leaves in autumn and no more pleasurable occupation can be conceived than the locating of some of these spots in the real.

With these thoughts in mind we pulled up before the Hotel des Empereurs at Tarascon, an hour before déjeuner, rather than push on forthwith to Arles as we had planned; "*les belles Arlésiennes, Grecques aux yeux de sarazine,*" could wait.

The town of Tartarin is no myth, though Daudet's leading actor—whose chief pleasure was hunting imaginary beasts—was only given a domicile here because he had to live somewhere, and because the Provençal is more or less a guileless braggart and blunderer in all things. This is not saying that he is not a good sort; indeed, the reverse is the case, for he is the most lovable of all the indigenous inhabitants of the old French provinces. Daudet gave his worthy bachelor a residence here simply because he was a true

child of the Midi, and Tarascon is as typical of the Midi of France as any other place still on the map.

"*Tarascon! Cinq minutes d'arrêt! Changez de train pour aller à Nîmes, Montpellier et Cette!*" This is about all the average



LES BELLES ARLESIENNES.

traveler knows of Tarascon: then he suddenly remembers Tartarin and looks up the town in his guide-book to see what else it stands for.

Nearing the Real Southland.

The automobilist is considerably better off. For a hundred kilometers he has been drawing up on the real southland until now olives and cypress trees in the landscape, and olives and garlic in his food (to say nothing of the *beurre de Provence*, the most strikingly pungent mayonnaise that was ever concocted) are no longer novelties.

Tartarin, as we know, had no real existence, but the entire locale of Daudet's tale is reminiscent of every kilometer of Tarascon's cobblestoned streets, and every jalousied veranda of its house fronts, and every stone of its old chateau of Roi René, the church of Ste. Marthe, and its proud old Hotel de Ville. Daudet's description of all this is exceedingly real; one should reread it on the spot: "*Tarascon, a little patch of Provence on the Rhone opposite Beaucaire.*"

Twelve thousand people live here, and it is a great railway junction and workshop, but for all that the automobilist in search of a *mécanicien* will do well to wait until he gets to Arles, or

about of its crops and even beasts and little children. There are two yearly fêtes which celebrate the suppression of this hungry monster of days gone by which are as quaint and curious ceremonies as the dragon processions of the Chinese. The "tarasque" of to-day is led in chains tranquilly through the streets, but his tail lashes out as of yore and the groans and growls terrify the young idea as they did the fleeing Tarasconais of all ages long ago. "The good king René" inaugurated the fête in 1469, and only when a parsimonious board of city fathers gets into office it is still a yearly event which draws crowds in thousands from all over Provence.

At Beaucaire, on the opposite bank of the Rhône, is the fine ruin of a crumbling old chateau contemporary with that of Tarascon, but perched high on the river bank in a most commanding situation.

The famous "Foire de Beaucaire," first instituted in 1217, was once the rival of that of Guibray in Normandy, and both were the precursors of the great fair of Nijni-Novgorod of to-day. Now the fair of Beaucaire is simply a *foire-marché* and a *fête-foraine* such as hundreds of others to be seen all over France, but within a hundred years it still reflected some of its former splendor and



BEAUCAIRE, FROM THE RHONE.



THE TARASQUE.



CHATEAU OF KING RENÉ.

to trace his wheel-tracks back to Avignon, provided his wheels will go round.

The Tarasconais resented loudly what they were pleased to call Daudet's caricature of them, but all the same Tartarin—*coquin de sort*—was not at all unlike many that one may see to-day sipping his "*Pernod*" or his "*Amer*" at the popular café of Tarascon's tree-shaded Cours or promenade at the aperitif hour.

Daudet described his hero as a "Don Quixote in the skin of a Sancho Panza," and the portrait will remain forever unaltered and unobliterated, and it will fit, too, many a real Provençal without being the least bit of a caricature.

He would be a great traveler—Tartarin, would have founded an empire across the sea, hunted lions in Africa, and done many other venturesome things—chiefly by word of mouth, but in the end he bought up a "dying exile" at Beaucaire, a scant kilometer away from Tarascon, across the ugly iron bridge which spans the Rhône.

Where King René Once Reigned.

The Chateau de Roi René is the very ideal of a building-block chateau. It bathes its foundations in the surging Rhône and its crenelated battlements and its shot-scarred walls form a story-telling picture of much vivid history that has been made within sight of it.

But a step around the corner from the hotel is the Eglise Ste. Marthe, whose founder suppressed the ravages of the dreaded "tarasque" all through the neighboring region. The "tarasque" was a beast, a sort of a cross between a dragon and a reptile, of enormous size, who lived only by devastating the country round-

magnitude when merchants came from Persia and the Indies and Arabia and Constantinople to vend their wares in this turgid Rhôneside town.

Tracing the Count of Monte Cristo's Footsteps.

Leaving this little corner of Daudet's country behind, not having been able to locate his "*Moulin*," which we had always suspected was in these parts, but which we were assured had not a real existence, we set out to trace the footsteps of Dumas' Edmond Dantes of Monte Cristo fame in the immediate neighborhood.

Disguised as the gentle Abbé, Dantes came here to the banks of the Rhône to pay a surprise visit to the unworthy Caderousse and his still less worthy spouse, two flinty-ribbed and harder-visaged characters of fiction which have never been excelled as portraits of villains by force of circumstance.

Caderousse and his wife had become inn-keepers at Bellegarde after having fled the tailor-shop in Marseilles, a dozen kilometers from Beaucaire on the Montpellier road.

The beauty and charm of these byroads of the south of France is that no matter how unfamiliar they may previously have been they invariably seem like old friends to the automobilist by reason of the facility with which he finds his way over them—great long silent stretches of marbly-white road, and often with ten kilometers straight-away without so much as a *caniveau* on them.

Automobiles are frequent enough passers by and through Bellegarde, but literary pilgrims are few. At any rate, there is no house there to-day corresponding to the mean, rough little inn beside the canal wherein Caderousse and his wife plundered witless travelers—the Hotel du Pont du Gard. There is an inn of

sorts, the Hotel Gédéon, and Dumas' description of its sun-burned, lonesome surroundings is good enough to fit. The only thing that doesn't apply is the fact that there is a fair sort of accommodation to be had, or at least a plentiful and gratifying meal may be had, with astonishingly good wine grown on the vineyards roundabout. Anyway, we were glad we came; it was an entirely untouched and unspoiled little corner where the thousand souls who call Bellegarde their home for the most part of the year while away their existence and read "Lou Armana" as regularly as the head of the New England farmer family, snow-bound in winter, reads the "Old Farmer's Almanac."

Frequently Pass, But Do Not Stop.

Automobiles frequently pass this way, but despite the old-world charms of the place, they seldom stop, judging from the commotion which our modest outfit brought about. The maid of all work at the inn was so staggered and amazed that she treated us with that fear and deference that she might have had for a stranger from Mars, glancing inquiringly from ourselves to the machine. "Damel!" she said, "*vous allez si vite, avec cette machine là. Combien pouvez vous faire de kilomètres dans une heure?*" "Oh, forty or fifty," replied the author of these lines—the chauffeur. "Oui. . . c'est beau, cette chose là! Mais est-ce que ce n'est pas dangereux?" Well, sometimes, perhaps, it is, but we assured her



HOTEL DU NORD, ARLES.

we were most temperate in all things and would not even run over a *belle poule* if we could help it.

Within an hour we were at Arles and settling down for the night at the Hotel du Nord on the Place du Forum—not the Hotel du Forum on the opposite side of the square, but the competing establishment which has a portion of the old Roman forum built into its outer wall.

For a fact, there's not much choosing between these two hotels; they both lack the character and local color of the country, and have in recent years been refurbished up and improved over what they once were until they are simply ordinarily good large-town hotels and nothing more, even though they be efficiently conducted. Garage accommodation is good at each, though limited.

Arles is an anomaly. Its hotels and cafés and some other things are modern and comport little with the very substantial relics of Roman arenas, tombs and palaces which link the city so closely with the romantic past, but for all that Arles is the most fascinating, though perhaps not the most livable, of all the towns of Provence, not the least of its attractions being the beautiful women with their old-time Greek profiles and their little top-knot coiffes, so dainty and charming that the susceptible—automobilists and others—put them well at the head of nature's portrait gallery of beautiful women.

[To be continued.]

WINNING THE MOTOR CHAMPIONSHIPS OF THE SEA

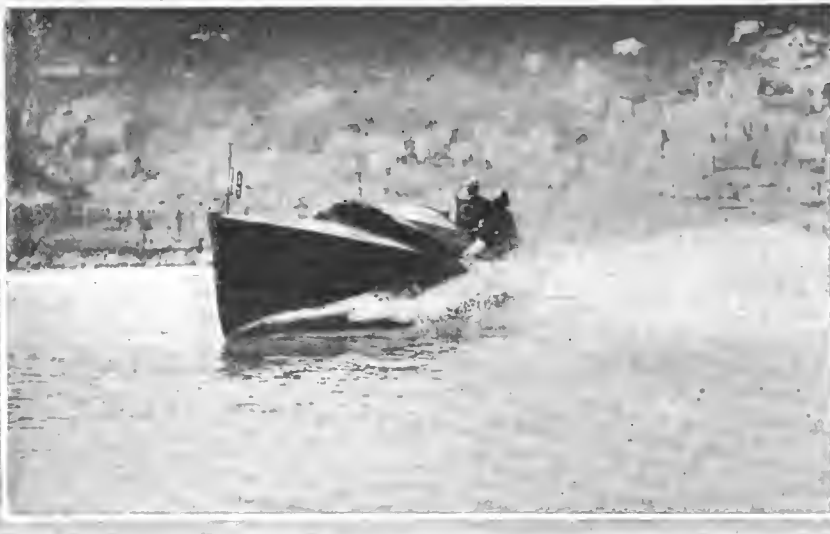
MONTE CARLO, April 16.—A blue sky, a brilliant sun, the water unruffled by the slightest breeze, and a dense crowd on the steep banks of Monaco Bay, were the accompaniments to the first day's racing of the fourth annual international meet.

Excitement was high when the six racers in the 26-foot class lined up for the 50-kilometers contest. *La Rapière II.*, the Panhard and Tellier combination, was the favorite; *Fiat XV.* and *Itala* were the Italian champions; *Seasick*, Itala engines and French hull; *Mouvette*, French hull and engine, and *Anadyomene*, a Franco-Italian craft, were looked upon as less formidable opponents in this contest.

At the last moment *Anadyomene* starboarded her helm and made for port; evidently her crew feared a recurrence of the previous day's proceeding, when, owing to her high Delahaye motor, the boat capsized. Soon *Rapière II.* and *Fiat XV.* were in the lead, rushing over the glassy surface at an amazing speed. The French boat made a better start, and maintained her advantage for some time, but seemed to be losing slightly to the *Fiat*. Tellier, how-

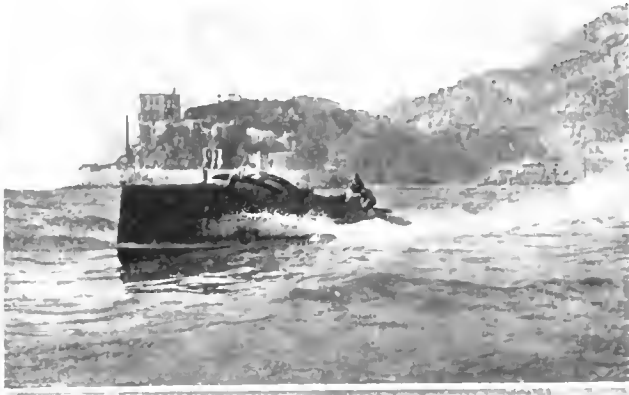
ever, shaved his boat round the buoys in a masterly manner, while the Italian boat went about very clumsily. At the end of a round the *Fiat* missed fire a few times, stopped, but a second later was off again. The second had lost him his position, however, for the *Rapière*, with its Panhard motor turning with clock-

work regularity, had got far ahead, and Baron de Caters had pushed his *Seasick* into second position. Tellier had no longer a serious competitor, and finished the race a good first. *Seasick* and *Fiat* continued to struggle for second position, and it was not until the fifth round that *Fiat* got ahead of her rival; had she been better steered round the buoys she would without any doubt have made much faster time, despite the trouble with her carbureter. *La Mouvette*, with her 24-



PANHARD-TELLIER WINNING 200-KILOMETER CHAMPIONSHIP.

horsepower Mutel motor, was no match for the more powerful boats, and finished the race at an easy gait. *Itala* had to abandon the race owing to lack of water circulation. At high speed her bow was quite out of the water, and her water inlet, which was placed forward, was high and dry. *Rapière*, on the other hand,



MAIS JE VAIS PIQUER, WHICH WON THE CRUISER RACE.

maintained a perfect water line, and covered her fifty kilometers without any fuss in 55:55 1-5, or at the rate of 33.3 miles an hour, nearly fourteen minutes faster than last year's winner.

Twenty-one boats started in the 50-kilometers cruiser race, *Capolou III.*, with a Mutel motor, being first at the rate of 20.8 miles an hour. Nine finished, three abandoned, and the rest were running when the race was called off. The day's results were:

26-FEET RACERS, 31:06 MILES.

1. La Raplère II, Teller Fils & Gerard hull, Panhard motor, 55:55 1-5. Average, 33.3 miles an hour.
2. Flat XV, Caroni di Streza hull, Fiat motor, 57:36. Average, 32.8 miles an hour.
3. Seasick, Teller Fils & Gerard hull, Itala motor, 1:1:50. Average, 30.1 miles an hour.

Owing to a heavy swell it was necessary to postpone the contest for racers on the second day, and even the cruisers were, with a couple of exceptions, unable to cover the fifty kilometers. The *Mais je vais Piquer*, a Swiss boat, took first prize

Racers Make Fast Time in Bad Weather.

The big racers made their first appearance on the third day of the meeting in a 50-kilometers contest over a rather rough sea, when the *Panhard-Tellier* proved herself the fastest and the most seaworthy race that Monaco has ever seen. Seven started, but on the first round *Daimler III.*, the English boat, dropped out unable to stand the buffeting of the heavy sea at high speed. Thubron's craft, the *New Trefle* with a Brasier motor, had to give up on the second round, owing to weakness having developed in her hull just under the engine; at the same time *Daimler II.*, the wood boat constructed by Saunders and fitted with three six-cylinder motors by the Daimler Company, had to make for port in a pitiful condition. Chevalier Florio's *Jeanette*, with an Itala motor, abandoned during the third round; *Flying Fish* ran for home on the fourth round, thus putting all the British boats, which were looked upon as dangerous competitors in a heavy sea, entirely out of the race. France and Germany were left for the final struggle, the former represented by the *Panhard-Tellier* and the latter by the *Mercedes D. L.* The three-ton French craft, propelled by its 250-horsepower Panhard motor, was marvellous for speed and for seaworthiness. At thirty-four miles an hour she took the head seas in perfect style, cleaving the waves in a manner that called forth admiration from both friends and rivals. The *Mercedes D. L.* showed remarkable seagoing qualities, but her speed was much inferior to that of her rival. The French were jubilant, for their boat had, in bad weather, beaten all records established in calm water at any previous Monaco meeting. The official results were:

50-KILOMETERS RACE FOR BOATS ABOVE 26 FEET.

1. Panhard-Tellier, Teller Fils & Gerard hull, Panhard & L'vassor motor, 54:27 1-5. Average, 34.2 miles an hour.

2. Mercedes D.-L., Decout-Lacour hull, Mercedes motor, 1:42:56. Average, 18.1 miles an hour.

In the cruiser section *La Lorraine* broke world's records by covering 50 kilometers at an average of 25 miles an hour. The boat has a Lorraine-Dietrich motor, and the hull was built by Perignon. *All'Erta*, an Italian boat with Fiat motor, took second place. The hydroplane race was devoid of interest.

Panhard Establishes World's Long-Distance Record.

French jubilation reached its height when, in the championship of the sea, a 200-kilometers open race for all classes, Comte Robert de Vogue piloted the *Panhard-Tellier* to victory at an average speed of 35.01 miles an hour, the fastest rate ever attained by any craft. The same boat's previous average on the 50-kilometer course, and that of her companion *Rapière*, were surpassed by a large margin, while the performance of *Delahaye*, the victor in last year's championship, at 26.6 miles an hour, looked like a dog trot in comparison.

On a perfectly calm sea, and under the gaze of twenty thousand spectators, the twenty boats got away in a compact mass. *Panhard-Tellier* soon shook off its competitors, and was only harassed a little by the *Fiat XV.*, piloted by Taroni. The Italian boat, however, had not the fine lines of the *Panhard-Tellier*; her bow was too far out of water, and her skin friction was greater than that of her rival. For three rounds *Panhard-Tellier* remained ahead, with *Rapière* and *Fiat* following her.

There was an interesting match between *Ulysse* and *Sec*, both with Mors motors, terminated by the withdrawal of the latter at the fifteenth round. *Flying Fish*, the Wolseley racer, ran regularly, but was slow. Thubron's *New Trefle*, with Brasier engines, only showed speed at intervals, and the *Mercedes D. L.* proved more of a cruiser than a racer. After an exciting struggle with *Lorraine II.*, the Italian cruiser *All'Erta*, shook off her French rival and secured second place. The cruiser *Ulysse*, with a Mors motor, obtained third place. Official positions were:

CHAMPIONSHIP OF THE SEA, 200 KILOMETERS.

1. Panhard-Tellier, hull built by Teller Fils & Gerard, engines by Panhard, 3:33:4. Average, 35.01 miles an hour, world's record.
2. All'Erta, cruiser, hull by Gallinari, engines by Fiat, 4:36:27. Average, 26.1 miles an hour.
3. Ulysse, cruiser, hull by La Sirene, engine by Mors, 4:59:49. Average, 24.8 miles an hour.
4. Flying Fish, racer, hull by Saunders, of London, engine by Wolseley, 5:14:13. Average, 23.7 miles per hour.
5. Adele, cruiser, hull by Baglietto, engines by Delahaye, 5:16:3. Average, 23.5 miles per hour.
6. Mercedes D. L., racer, hull built by Decout-Lacour, 7:53:6.
7. Pilote I, kerosene pilot boat, hull by Société des Vedettes Automobiles, engines by N. W.



THE MARINE RACE COURSE AT MONACO.

FIRST AUTO IN THE CANADIAN COBALT COUNTRY

By A MICHIGAN EXPLORER.

A TELEGRAM had come from Cobalt, Ontario, stating that automobiles were impossible because of the impassable roads. The manager of the Canadian Bank of Commerce had sent the information, which, instead of deterring the writer, made



WHEN THE CADILLAC MADE ITS DEBUT IN COBALT.

him the more eager to show that good roads were not an absolute necessity for a Model M single-cylinder Cadillac and that it could go anywhere where horses could travel.

The inhabitants of Haileybury, Ontario, center of the Cobalt or Temiskaming mining district, watched the entrance of the car into their city with wide eyed and all absorbing interest. Horses took an entirely different view of the matter and made strenuous efforts to get to the tall timber. Few people of Haileybury had ever seen an automobile before. The town proper is built on the side of a grade of about 15 per cent, and it was up, down, and sidewise on this grade that we were compelled to operate from the start.

Originally Haileybury was just a camp. The houses or shanties looked as though someone had stood out in the lake and thrown them at the side of the hill. If they landed facing north, south, east, or west, it was all right, but their proximity to each other did not matter at all. But last Fall a fire came along and now there's a new Haileybury on the map. It claims to be a city with streets. It has two: one of them runs from the railroad station to the lake; the other crosses it. Haileybury claims to be the center of all the Temiskaming mining country, as perhaps it is. It has several hotels, each one with a big, lively bar in connection; has a De Forest wireless telegraph station; a steam fire engine, and a free library and reading room. Truly it is metropolitan.

After having satisfied ourselves and the people of Haileybury that there was nothing in the town that we couldn't climb up or go over, we started to New Liskeard, another mining town some five miles away. In many instances the roads encountered were beyond description. Over these roads had been hauled the heaviest of logs the entire Winter, and on sleds that were not standard width by about twenty inches, necessitating the breaking through with one front wheel of our car of about four feet of snow and slush, and in many instances fairly dragging the body of the car on the ice and snow in the center of the road where it was firmly packed. Grades of from 15 to 20 per cent. were found to be usual instead of exceptional. We were frequently offered tows by the accommodating loggers and teamsters, but in no case were we compelled to accept them, as the car, by digging out and prying up, was able to make its own way. In only one instance on the road from Haileybury to New Liskeard did we meet any serious difficulty, and this was when

the car was mired in snow and slush until the drive wheels fairly spun round, with nothing on which to hold. It was necessary here to secure logs, sticks, etc., and pile under the wheels for something like forty rods, enabling them to take hold and extricate the car. Two miles and a half of this road was endured when we found a place that by almost letting the car fly we could get down to Lake Temiskaming. We made the balance of the distance on the ice.

The return from New Liskeard to Haileybury was without incident of any kind, being made over the ice, driving the four or five inches of slush and water in many places 25 and 30 feet on either side of the car. The four and one-half or five miles were covered in some twelve minutes.

The following day a trip was undertaken from Haileybury to Cobalt. Quite a crowd of people collected about the car before starting, and the accommodating livery man offered to send teams along to drag us out of the holes that they predicted we would never be able to get out of under our own power. We thanked them very kindly, however, and started. In no place in the United States will roads be encountered such as are met with from Haileybury to Cobalt. One is either on the top of the mountain, or else plowing his way through a swamp, or sliding down, or crawling up, or skidding sidewise on a hill. In the distance of five miles there are only two places in which a team or car can turn around. It is either go ahead or back up.

In some instances the snow was soft and slushy and was four and as much as five feet deep. In others it had entirely melted, and the car was forced to make its way through from twelve to eighteen inches of water. In some places corduroy roads had been built through swamps and were now submerged in water, snow, and slush from a foot to three feet in depth. In no instances are these corduroy roads over sixty inches wide, and when one wheel went off the end it meant that it simply sunk out of sight and that the body of the car was resting on what was below; perhaps it was snow, perhaps water. At any rate, you could count on it resting on something that was not very good for your carbureter or your spark plug. In some places the snow was so deep that it was necessary to leave the car and dig roads through for the one wheel for which there was no passage before further progress could be made. One hill was encoun-



WORLD-FAMOUS LA ROSA MINE, WORTH \$20,000,000.

tered of about a 23 per cent. grade. It was not long, but down either side of it there simply ran rivers through which it was necessary to drive the car. There was absolutely nothing for the wheels to catch hold of. Whenever we would get the wheels ready to run the body would be on the bottom or ground so hard



WINCHING" THE CAR UP A VERY SLIPPERY HILL.

that it would have torn it all to pieces to have attempted to drive uphill. After about an hour see-sawing back and forth on the hill we gained the top by winching the car up with ropes wrapped around the rear hub and tied to trees ahead of us. In going down, although the brakes held the wheels till they slid, it required the most skillful driving to avoid a smash.

The arrival in Cobalt was "one grand entry." Our first call was paid to S. H. Logan, manager of the Canadian Bank of Commerce. He was very much surprised, indeed, to see anything move without horses tied to it in that section of the country, and expressed his surprise in quite strong language. Several hundred people immediately gathered about, inspecting the car from all sides. Our Cadillac was the first auto they had ever seen. It was decidedly the first car that had ever been seen in the entire Cobalt region.

Cobalt we found to be purely a mining town, different from

New Liskeard and Haileybury in that the houses had been thrown at greater random. The main street was something like twenty feet wide in its broadest places, and led into a public square. This square seemed to have been placed there by accident and left through force of circumstances. There are no saloons in Cobalt, yet one can buy anything in the way of refreshments that is desired. Law and order are maintained, but not a policeman can be seen anywhere. The one or two rich mines that have given the section its name for fabulous wealth are directly opposite the town of Cobalt, across the lake. One can stand on the porch of the Cobalt hotel, the leading hostelry there, and see the shafts of the famous Nipissing and La Rosa mines, can see the excavations of the Right of Way mines and Townsite mine, neither of which has thus far paid, and it seems as though will not pay; and you can but wonder why it is that there are some 2,000 people coming into this section each day, all to gain great wealth and returning without even their expense money in their pocketbooks.

So far as the automobile possibilities are concerned, in this section of the country there are none. During the Summer months, when the roads in the United States are dry and hard, teaming is abandoned in the Temiskaming district because the marsh is so deep and boggy that even liverymen plying between Haileybury, Cobalt and New Liskeard are compelled to take their loads down the railroad track, finding out at the different stations whether or not a train is coming, or will catch them before they can get to a switch, and either going ahead or waiting accordingly.

There has been, and continues to be, agitation for some sort of macadamized roads from Cobalt to Haileybury, which is the center of this region, but either the Provincial Government is opposed to it on account of its railroad, or else not enough pressure has been brought to bear as yet to secure them. The entire section is truly an enigma. It is an old country. You will find people who have lived here all their lives, but the country seems still new and is new and undeveloped. Its silver may be the richest in the world; what there is of it, perhaps, is, but geologists say that it is but a pocket and will soon be exhausted. If that time soon comes the \$300,000,000 of American and English money that is invested there will be sorely missed.

CROWDED CIRCUIT FOR GERMAN EMPEROR'S RACE

THE ninety-two cars entered for the German Emperor's Cup will be started on June 14 at intervals of one minute on a 74-mile circuit near Frankfort. The starting point will be on a plateau between Saalburg and Kloster Thron, about sixteen miles from Frankfort. Generally the road surface is excellent, and there are a number of straight stretches on which fantastic speeds may be attained; the passage through some of the towns,

however, necessitates a certain amount of caution, and there are a number of sharp turns which will test the skill of the drivers. There will be no neutralizations, and on the day of the race the course will be guarded by army veterans. To prevent accidents before the race minute regulations govern practicing. After a certain hour of the morning huge stones are rolled into the center of the road, making speeding impossible.



ROAD BETWEEN KONIGSTEIN AND OBERURSEL.



ENTERING THE VILLAGE OF WEILBURG.

DISMOUNTABLE RIMS AND THEIR USEFULNESS

ALTHOUGH dismantlable rims have given convincing proof of their usefulness and general efficiency as a racing adjunct, automobilists have been rather slow to adopt them, on the assumption that they were not suited for touring condition. Nobody denies the saving of time and labor in changing tires under the new conditions, but all motorists are not certain that the two metal surfaces will not rust and make dismantling an impossibility, or that the new conditions present the same degree of safety as the old. There are, in fact, several makes of dismantlable rims on the market which leave much to be desired in the matter of security. A very severe test of dismantlable rims was made by the 6,200-mile winter tour round Europe recently undertaken by Van Marcke as a try-out of a six-cylinder Hotchkiss car. The test provided all that the most exacting could demand: a fully equipped touring car, winter roads, long distance, mountain climbing, and fast running. Van Marcke's opinion is that the dismantlable rim gives all that can be desired of it. He has only one objection to bring against it. Each time he removed the metal valve cap to pass an inflated tire over the fixed rim a certain amount of air escaped from the valve, although he was certain when the tires were inflated that he had correctly screwed up the valve. Thus after putting the inflated tire in position on the wheel he had to pump a little air in to make up the amount lost.

A close examination of the wheel by Michelin experts revealed

the fact that the special type of metal cap used on dismantlable rims was responsible for a slight leak at the valve under road vibrations. On leaving off the cap no further trouble was experienced, and a rag wrapped round the valve protected it from dust. To prevent a recurrence of this trouble a sleeve has been designed to slip over the valve stem before the cap is put on.

Further lessons learned by the long tour were that the projecting end of the bolts should be wiped before taking off the nut. Unscrewing and screwing with dust and sand on the thread is bound to result in wearing down the thread and may be the cause some day of an unfortunate breakdown. Before mounting the nuts a rag should be passed through them and, as a further precaution, a drop of oil or a little grease should be put on the ends of the bolts.

For fixing the complete tire on the wheel a special brace is provided, which, to the surprise of many users, is not made to fit the special countersunk security bolts used on these rims. The reason for having two tools where one might be thought sufficient is that the safety bolts should not be screwed up tightly until the tire is completely inflated. It is the compressed air alone which should bring the bolt into proper position and not an exterior effort on the bolt. Thus instead of the brace, which is a powerful tool, and might be used injuriously, a special key with which a relatively small effort can be exerted, is used for the safety bolts.

"TROUBLES ON THE ROAD"

By A. D. HARD, M.D., MARSHALL, MINN.

MY little buckboard has been doing valiant service during the Winter months, when snow was deep and roads were almost considered impassable for anything on wheels. But I have not been exempt from "troubles on the road," and as there are many buckboards in use, it may be of interest to others to know how I emerged successfully from my perplexing predicaments. My first trouble came from the meddlesomeness of a "know-it-all" friend who undertook to increase the power of my motor by stretching the inlet valve spring. The result was that the suction of the piston was not sufficient to open the inlet valve except at high speed, and the motor could only be started by generously priming the cylinder with gasoline. The power was not increased. In my opinion, mechanically-operated inlet valves are the only proper kind, and meddlesome "know-it-alls" should be shot.

Most of the nuts on the buckboard are held in safety from shaking off by cotter pins, but some are not, and these began to work loose and drop off at most inconvenient times. All nuts that are vital to the running of an automobile should be crown nuts, with thin steel washers to adjust them so that the cotter pins would hold them secure from shaking off. The exposed position of the air intake resulted in snow and rain being drawn into the carbureter until the motor stopped. I tied my handkerchief over the intake loosely until I arrived home, then I placed a piece of rubber hose over the intake with the other end in a protected place, and had no further trouble. A ridge in the middle of the road struck the pan surrounding the transmission wheel, bending it up until it acted as a transmission brake. With my starting crank I pounded it down so that it would not touch the wheel, and at once got back my power. The screw which holds the chain together at the coupling dropped out and the chain came off. Borrowing a ten-penny wire nail from a nearby fence, I bent the surplus nail up over the chain so that it would not strike, and came home flying. A stone flew up and got caught between the chain and the sprocket wheel. Of

course the chain broke. With two quarter-inch bolts two inches long, found in my "catch-all-box," I bolted the chain together around the jackshaft sprocket, and also to a brace on the frame, and, putting the transmission on slow speed, came home at my usual speed with only one drive wheel kicking the ground.

My batteries gave out one cold night ten miles from home. I woke up a farmer, got some vinegar and, boring a small hole in the asphaltum covering of the cells with my jackknife, poured about one tablespoonful in each cell. I had a hot spark all the way home. When stalled in a deep snowdrift I tied a string to the switch in such a way that I could break the current with a pull while in the rear of the machine. Then starting the motor on slow speed, I got behind and pushed. I have got out of mud holes the same way. I broke a front wheel off in the knuckle. A telephone message brought me a livery rig from town, and with a halter strap I suspended the front end of the buckboard under the rear axle of the buggy, and the team came home on the trot, the buckboard following gaily on its hind wheels. Once I got in some soft ground so deep that the rear wheels sunk to the hubs and then slipped. I borrowed two fence boards from an obliging fence nearby and crowded them well under the drive wheel sprockets. The little machine crawled out on its sprockets beautifully. Ran out of gasoline eight miles from a supply at night. I worked my think-tank pretty hard for half an hour, then mixed four ounces of ether which was in my medicine case with one quart of kerosene oil from a farmer's lamp can, and, say, you should have seen that auto "hit the pike."

A leaking tire valve was most awfully persistent. I pumped up the tire and, detaching the pump tube from the pump but leaving it fast on the valve stem, bent it upon itself and tied it to a wheel spoke. On one occasion I lost my starting crank. Setting the transmission lever at high speed, I primed the cylinder generously with gasoline and gave the car a quick push of about three feet. The engine promptly began to do duty and I had to be quick to release the transmission.



THE ALBATROSS, AIRSHIP DESIGNED BY T. WEISS.

FLYING MACHINE MODELS AT LONDON SHOW.

LONDON, April 15.—There is a really pathetic side to the exhibition of flying machine models forming a part of the automobile show in the Agricultural Hall. One old man tramped thirty miles from a quiet little village in the west with his cherished model under his arm. You may talk with a score of them about the hall, earnest, serious-minded men, who for years have been groping along, unaided, neglected, isolated, but always confident that they were on the verge of one of the greatest discoveries the world has ever known. A mere glance at most of the models is sufficient to show that the designer has not mastered the elementary principles of aerial flight and that he has been working blindly, a victim of his isolation. Fortunately the models remain models; had they to grow into full-size machines they might have a decimating effect. There may be hidden somewhere in the hall a machine that can do more than make an aerial jump, but we have not discovered it. There are many that are curious, many that show ingenuity, and just as many that are crazy. One of the curious type is shown by Mr. Pickering, a native of the West Indies who has devoted forty years of his life to the evolution of his pet. It is on the compressed-air principle and consists of a drum-shaped body with small holes at top and bottom and four fans inside, which cause atmospheric action similar to that of a bellows. Under the machine is a powerful propeller driven by an electric motor, and around it are six circular tubes, slightly curved rearwards; the air is forced down these tubes, and as they slant back air is driven rearwards and the machine sent forward.

A Frenchman has a four-winged machine, worked by a strong spiral spring. Two of the wings go up while two go down, so that the air, by being forced away from the wings as they meet,



FELL AEROPLANE, EXHIBITED AT RECENT LONDON SHOW.

drives the model along. There is a weird looking creature with a fish-shaped body and two broad wings outstretched as in flight, all made of corrugated aluminum. The wings are made to flap by means of clockwork within the body, and in addition there are two propellers, one forward and one aft. Army officers play a considerable part in the exhibition. Major B. Baden-Powell has two or three rather promising models; Major Moore has two interesting models of winged-shaped flying machines mounted on miniature towers, with a double pair of wings, working one above the other in parallel. Captain Jones has an aeroplane which possesses more simplicity than can be found in most of the models. One designer has taken an albatross as his ideal, filled its body with machinery which gives a flapping motion to the wings. Another has worked on similar lines with a bat as his model. At the close of the show the models will be put through practical tests, but it is not likely there will be any startlingly practical results. The \$50,000 which the *Daily Mail* offers for a flight from London to Manchester will not change hands for a long time yet. A French aeroplane suggests the use of a small balloon with aeroplanes, as a measure of security in making experiments. To attempt a turn, an aeroplane must be some distance from the ground, and the failure of the engine at such a moment might be serious. A small balloon would prevent a violent fall, and its assistance in keeping the flying machine aloft would permit of observations of its actions being made and defects recognized.



A RENAULT AND ITS ROYAL SIAMESE OCCUPANT.

Dominique Lamberjack, of Paris, giving a demonstration run in a Renault car to Prince de Rabi de Rajaburi, son of the King of Siam. A stop on the way near the Park des Princes cycle track.

LIGHT MOTOR FOR KNABENSHUE AIRSHIP.

TOLEDO, OHIO, April 22.—After a full winter's work, Roy Knabenshue has produced an original gas engine for his air ship. The motor, which develops from 12 to 16 horsepower, weighs only fifty-four pounds. It is of the two-cycle, air-cooled type, valveless, and will work with any carbureter. One of the features of the engine is a spark coil with six windings, instead of the usual primary and secondary. The carbureter throttle and spark timer are new features invented by Knabenshue, details of which have not been made public. The engine will be used for driving the steerable balloon on which Knabenshue has spent considerable time and labor.

PRESIDENT BISHOP HAS SAILED FOR EUROPE.

Cortlandt Field Bishop, president of the Aero Club of America, has sailed for Europe, and will remain abroad until September. Mr. Bishop intends to devote a large amount of time to automobile touring, particularly in the Alpine districts. In his absence the executive head of the club will be J. C. McCoy, who was recently elected vice-president.

AUTOMOBILE CHANGE GEARS AND THEIR JOURNALS*

By HENRY HESS, MEMBER SOCIETY AUTOMOBILE ENGINEERS.

FIG. 9 is a three-speed gear, with a three-gear slider. The slider spool is indicated by the shaft passing through it. The center distances of the shafts as well as those between the gears and bearings are to scale, each division of the cross-section paper representing one inch.

Each gear-pair is given a Roman numeral, as I, II, III.

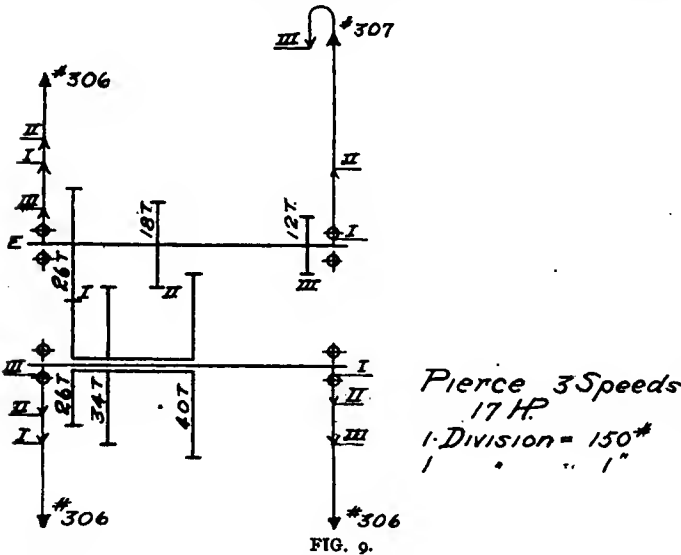
The journal loads at the bearings for each drive are plotted vertically over each journal to a scale of one division equal 150 pounds.

Light arrow joints marked with the same Roman numerals show the amount of each load. Solid arrow points with numbers as 306, 307 give the rated steady load and speed-tabular capacity of the bearings known by corresponding number symbols.

A glance will show the relationship of imposed loads to bearing rating. In some cases bearing choice has been governed by shaft sizes and arrangement of parts rather than by loads, which accounts for some variations in selection. Occasionally the length of a load line would extend beyond the confines of the slide; it is then bent over and the true length is the total of the parallel portions.

"E" indicates the engine or driving end.

Considering the value of Fig. 9 we see that with the 26-26 tooth gear-pair I in engagement, the upper left-hand bearing



is loaded to the amount of arrow point I, which is about half the tabular steady load and speed capacity of bearing 306.

The load on the bearing at the other end of the upper shaft, due to this gear-pair, is very small, and indicated on the diagram as I at that bearing. On the lower shaft also the loads are well within the bearing ratings. The heavier loads on each journal are, counting from the top left to top right, to bottom left to bottom right, due to gear-pairs II, III, I and III. With one exception these approximate one-half the rated bearing capacity. The exception is the two-speed gear III load in the upper right-hand bearing, which somewhat exceeds the bearing rating. A similar condition is not unusual, as, for instance, on Figs. 11, 13, 16, etc. The conclusion must not be drawn that the other bearings are decidedly large, but rather that the relatively little use of this gear-pair, coupled with a slowing down of the engine and consequent reduction of actual piston pressure, favors this particular journal. Actual overloads to produce ball crushing are not to be expected of any bearing that is likely to be demanded by consideration of shaft size, etc.,

*Second part of paper read before Society of Automobile Engineers at New York; continued from issue of April 18.

remembering that bearings of the medium weight series are usual for gear boxes unless abnormally large bearings are demanded by peculiarities of the mechanism, in which case the light-weight series comes under consideration.

In the three-speed gear of Fig. 10, it is apparent that shaft dimensions have called for bearings having relatively larger factors as compared with the loads imposed.

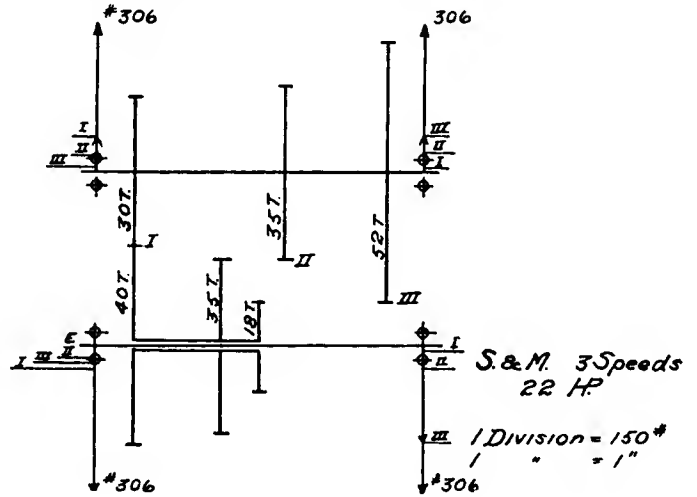


FIG. 10.

The four-speed gear of Fig. 11 follows the previous Fig. 9, in that the bearing values are about double the loads with the exception of the slow-speed load that shows up higher than the bearing rating.

In the four-speed set of Fig. 12 all of the loads are well within the bearing capacities demanded by shaft diameters.

Fig. 13 is another example confirming the previous ones.

Fig. 14 has two sliding gear sets for four speeds. The bearings demanded by the shafts are all well above the loads, including even the slow-speed load. The fact that all bearings may be of the same size is a distinct shop advantage, not counter-balanced by higher first cost of bearings, since, even though a size smaller for one or the other might be worked in, the difference in cost of these smaller bearings is inconsiderable.

A first example of a direct drive jaw engaging gear with one slider is this Fig. 15. This is the first deviation from the general

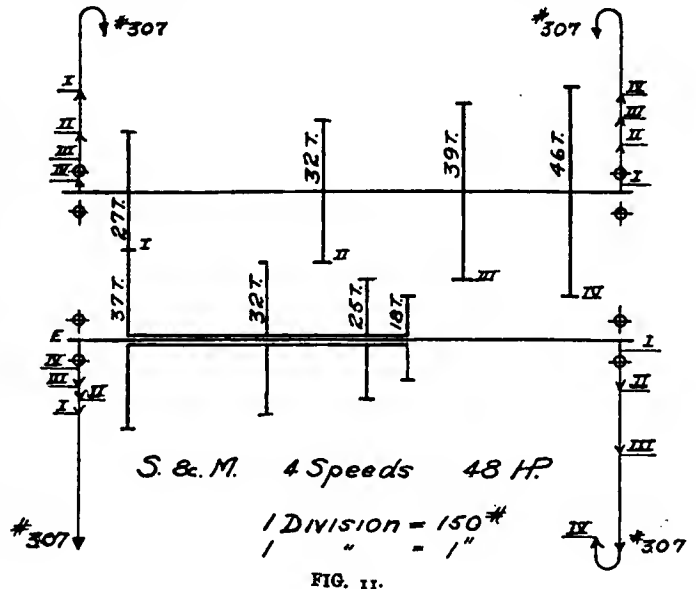


FIG. 11.

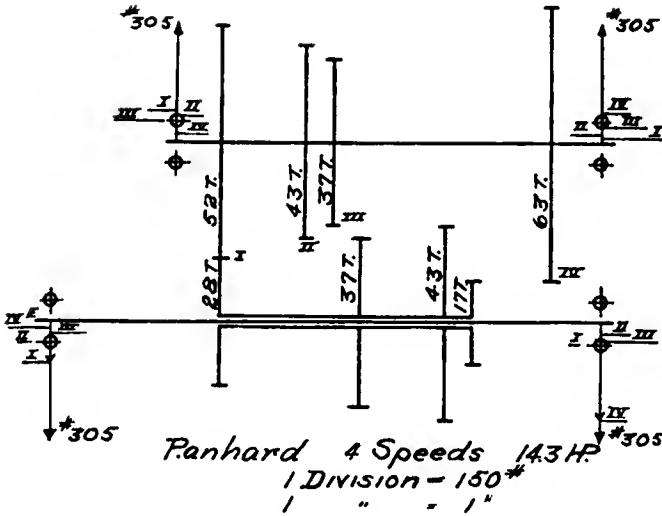


FIG. 12.

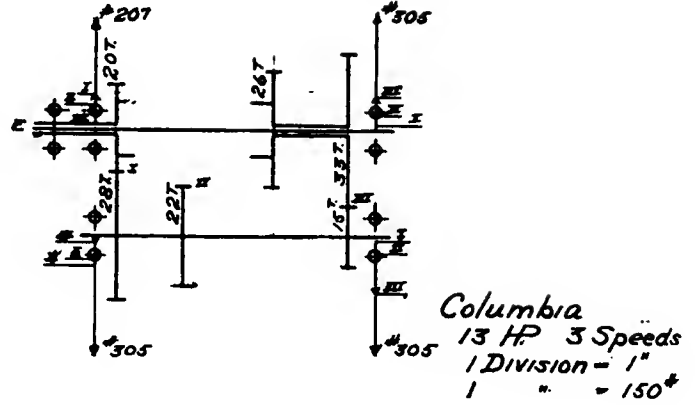


FIG. 15.

practice of employing bearings of the medium weight series, two from the light-weight series, No. 207, carrying the engine and spool; their larger bore is demanded by the necessity for size due to the drive shaft being journaled in the spool. Approximately, bearings having the same outside diameter in the two series may be used interchangeably; thus bearing No. 305 used

the spool, and will be ample, as its location subjects it to smaller loads.

This succeeding example, Fig. 16, confirms the previous ones; as do also Figs. 17 and 18.

Fig. 19 is the first example of ball bearing use for the inner end of the drive shaft, where it is journaled in the engine shaft end. Rather restricted space consideration will naturally lead to the conclusion that this bearing (No. 305) would be relatively more heavily loaded, still, under the maximum condition due to gear set III—the second fastest—such load is within the bearing rating.

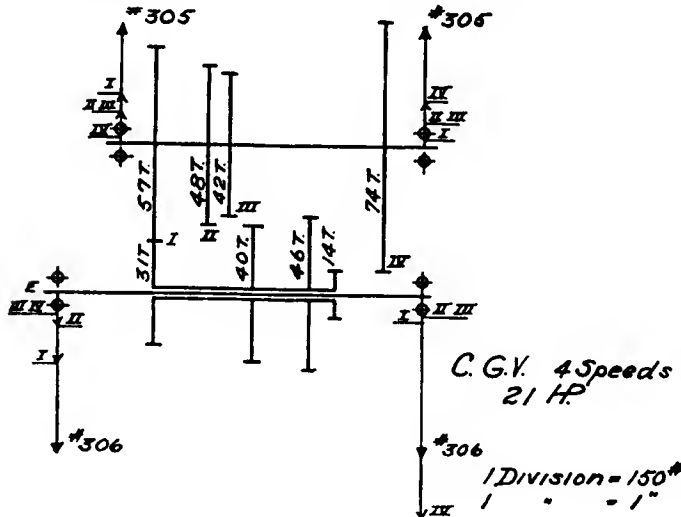


FIG. 13.

This is true also for Fig. 20. Here a comparatively small bearing of the light-weight series, No. 206, is quite ample for the outboard journal of the driving shaft—the upper left-hand one. If, however, any unbalanced couplings or other elements are carried near this, a bearing of corresponding bore of the medium-weight series, as No. 306, should be substituted.

As the spur gear part of Fig. 21 is along substantially the same lines as the previous examples, the bevel gearing only need be referred to. The thin direction arrows at the bearing below the bevel gear show that this is subject to radial load as well as the outward thrust of the gear, and also so mounted as to restrain the bevel gear against meshing too deeply. The magnitude of the thrust is measured from the shaft intersections to the arrowpoint. Remembering that one pound of thrust is the equivalent of three pounds radial load on a bearing of the radial type, an addition (not indicated) of four times the thrust length to the maximum radial load IV shows that the capacity of No. 207 is pretty well used up. Personally, I should prefer No. 307 to the 207 used in the German example.

on the other journals has an outside diameter of 72 mm., and a rating of 620 pounds as against No. 207, of 72 mm. and 600 pounds; but the larger bore of 35 mm. of 207, as compared with the 25 mm. of 305, adapts it for use on the spool.

No. 207 will probably work in best also on the farther end of

The thrust of the bevel pinion is taken on a collar bearing 6-R, which, as is shown by the arrow on the thrust line, has a factor rather better than two at the speed in question.

Figs. 22 and 23 are also bevel gear sets, in which the thrust bearings of the collar type have factors slightly less than 2 for Fig. 22, and about one and one-quarter for Fig. 23.

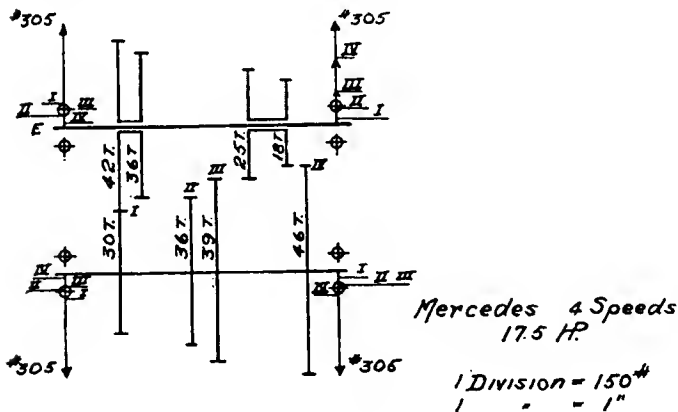
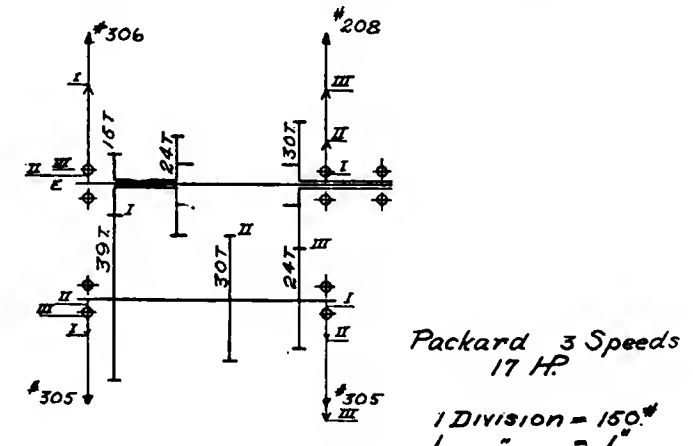
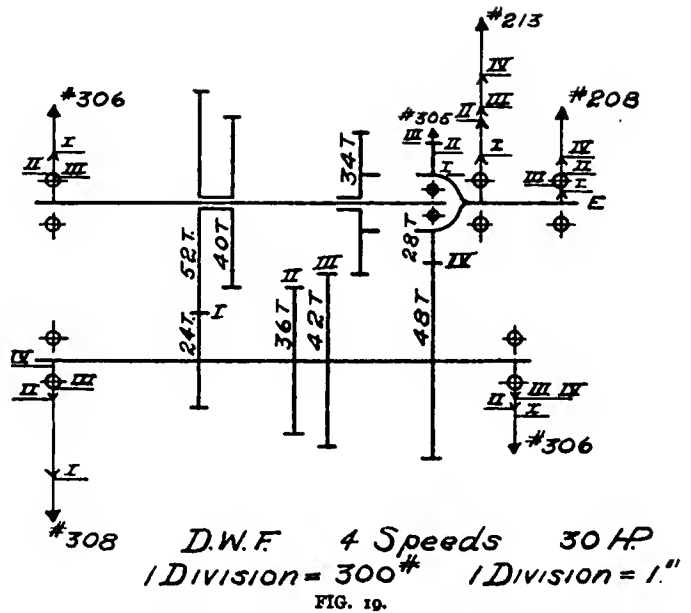
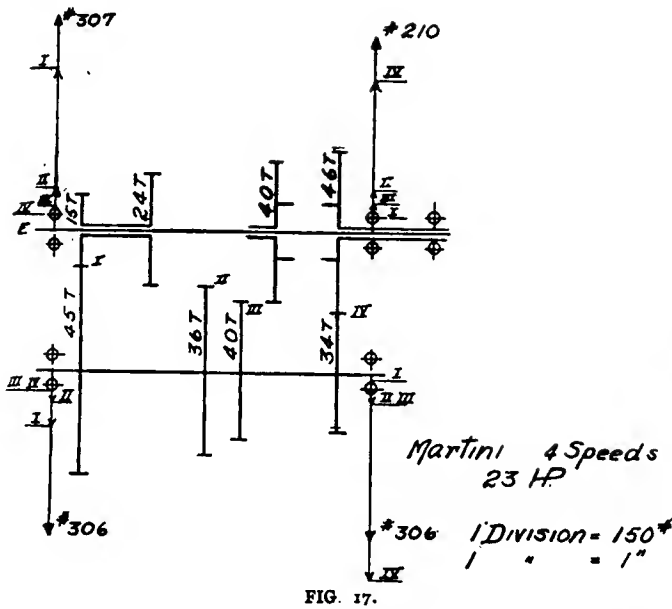


FIG. 14.



G. 16.



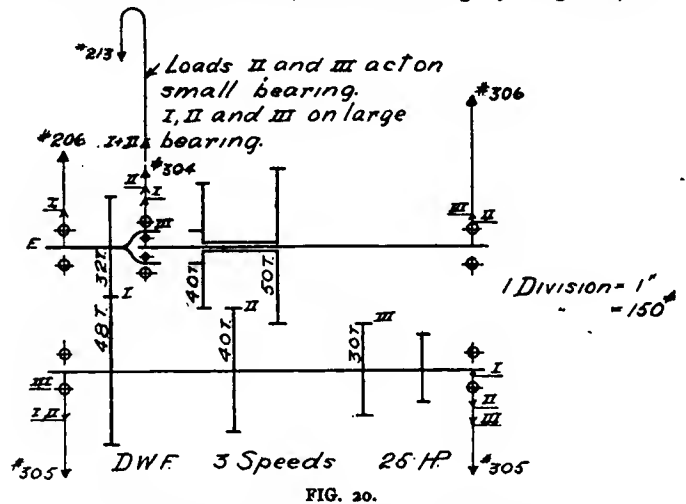
While similar records of experience may be collated for bearings of any type, whether ball, roller or plain, it must not be overlooked that this is a record of experience, and can therefore be applied, as regards sizes and all quantitative relations, only to the bearings in question, which were all either D.W.F. or H.B.

Similar records of actual experience with every form of ball or roller bearing in use have been carefully collated and the lessons drawn utilized along with these from the D.W.F. to aid my keeping up a steady advance in this highly specialized field.

The journal loads given in the various preceding examples are readily enough derived by calculation from a determination of the tooth pressure at each gear pair or torque at the gear radius required to transmit the H.P. at the speed in question, this in turn resolved into loads on the shafts at the centers of the gear faces in inverse proportion to the gear radii and these again divided between the shaft journals in inverse proportion to the distances from the journal center to the gears. Yet, a graphic determination of these factors has the advantage of simplicity of checking the intermediate steps, of proving the latter automatically, and of permitting the direct transference of the results with a pair of dividers to the journal diagrams.

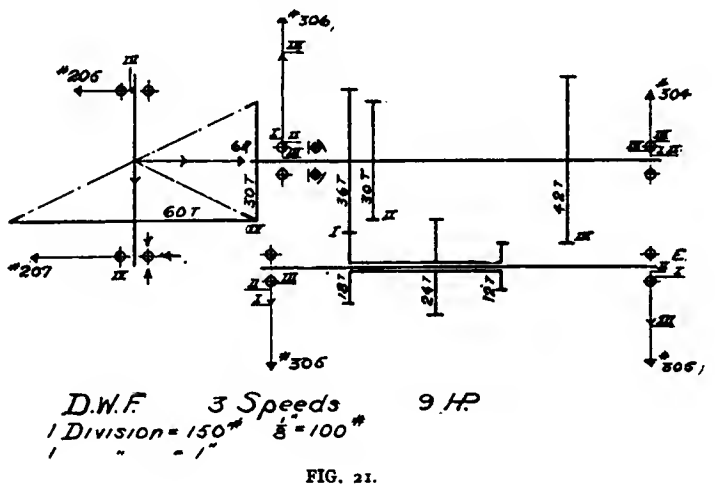
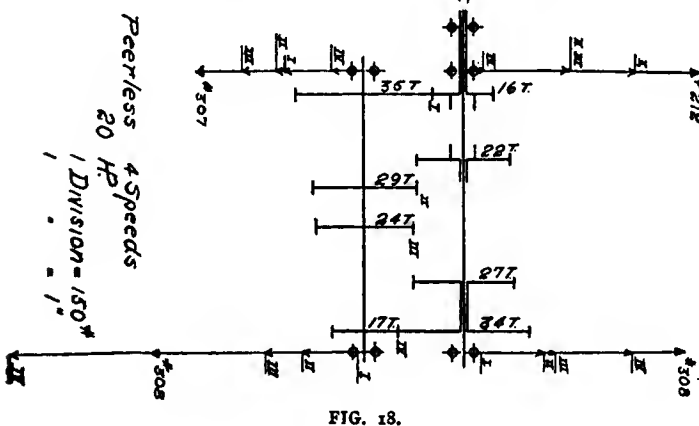
In Fig. 24 one gear pair and the four journal locations of the two shafts are shown to scale. The pitch line torque L is laid off below to the desired scale; a vertical, M, corresponding to the gear radius, is laid off at one end of L upward, and the pinion radius N downward at the other end of L. A diagonal connecting the extremities of M and N will intersect L and divide it into two portions, P and Q, that give the loads at the shafts.

Taking the lever arm A of load Q to the journal, and erecting this as a perpendicular upward from the intersection of L just found, then dropping the lever arm B perpendicularly from the extremities of L, and connecting by diagonals, will



give intersections dividing load P into 1 and 2, acting on the bearings of the lower shafts and 3 and 4 acting on the bearings of the upper shafts.

If the torque L has been calculated correctly, all subsequent steps prove up, since the sum of the four loads must equal the original torque.



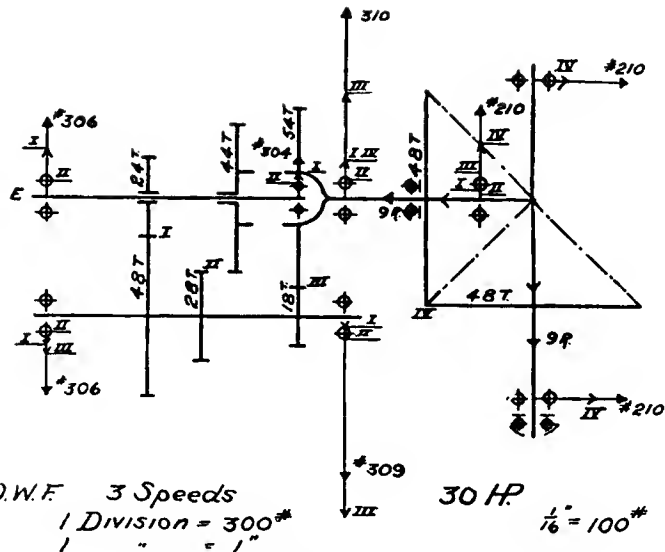


FIG. 22.

The graphic determination of radial and thrust loads is given in Fig. 25.

The calculated pitch line torque, L, is laid off to scale in a

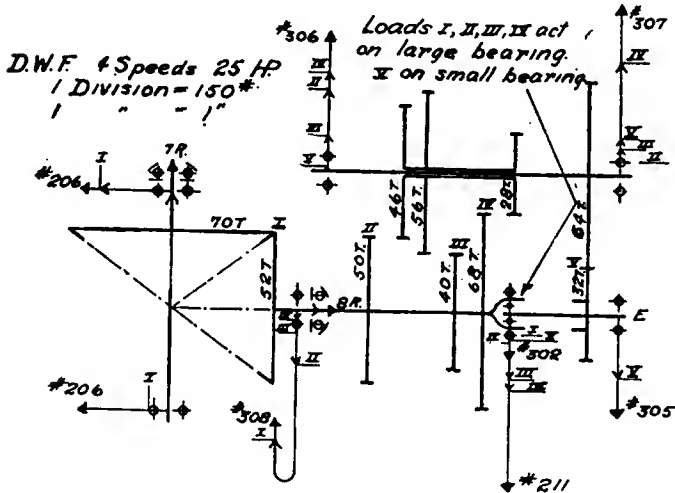


FIG. 23.

direction normal to the pitch line. Lines parallel to the shaft are laid off from the extremities of L. From their intersection a perpendicular to L is drawn. From the meeting point parallels to the shaft are drawn. The resultants 1 and 2 are respectively the radial and thrust load of the pinion, and are transferred with the dividers to the gear diagram.

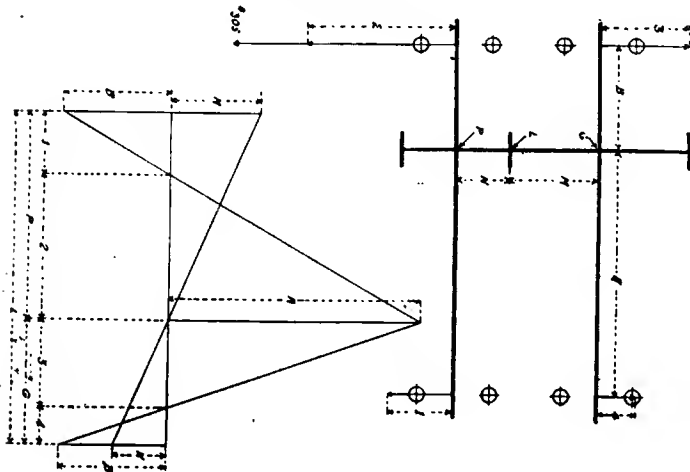


FIG. 24.

Distances 3 and 4 relate to the bevel gear respectively as thrust and radial load.

The thrust loads on the bearings are not affected by the location of the bearings along the shaft. The radial loads found act on the shafts at the point indicated by the largest pitch radii as shown. (Strictly, this is modified by the length of the gear teeth and their accuracy of contact. Theoretically, the correct point of average torque is about one-third of the tooth length inward. As all results are merely comparative,

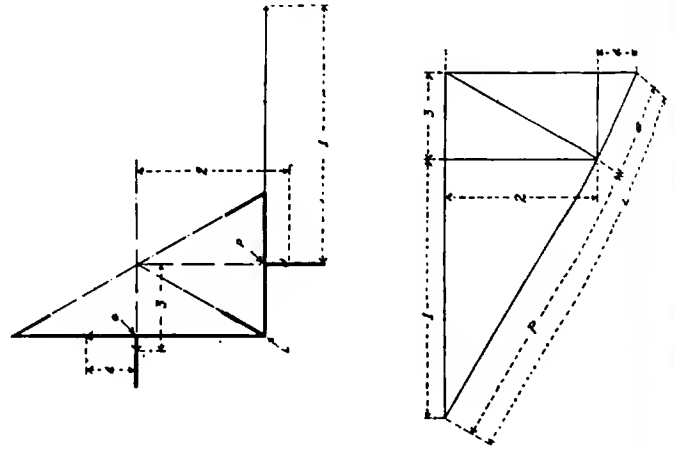


FIG. 25.

this deviation from strict truth gives greater simplicity and does not alter comparative results.)

The division of these loads into radial loads acting on the journals is graphically accomplished in the same way as explained in connection with Fig. 24.

As there are present many users of ball bearings, and they no doubt will agree with me that their several interests can best be served by the fullest possible consideration of, not only their individual experience, but of that in connection with the experience of others, I sincerely trust that they will favor me with their observations, so that I may in future, as I have in the past, analyze and compare them and draw conclusions and make these available to all, though, of course, regarding the individual communications as confidential.

[EDITOR'S NOTE.—As the drawings are not reproduced here in the original sizes, the cross sectioning has necessarily been omitted.]

THE ADVANCE OF THE AUTOMOBILE.

The automobile industry having passed the perils of infancy and early youth, seems to be coming fast into its rightful inheritance as a prominent factor in the commerce of the country, says *Engineering*. Almost as soon as it was born it was attacked by that most terrible disease of young mechanical invention, the microbe of which is the company-monger. We remember with some satisfaction that we did what we could to counteract this danger, but its effect was so serious that for a long time the native industry was stunted in growth, and this country had to depend chiefly on imported cars for its supply. Another infantile ailment from which the motor car suffered was due to those owners of cars who used them simply for rushing along the highways of the country at the highest speed they could reach, regardless of the comfort, convenience, and even safety of all other users of the road. Shortcomings in design that marked the earlier stages of the movement we do not regard as morbid symptoms. Nothing mechanical is born perfect, and progress towards higher efficiency is always through experience; that which is abandoned on one day forming a stepping-stone for the more perfect device of the next. The steps, however, would have been fewer had the engineer been oftener consulted in early days. The trail of the unmechanical is still over the industry, but happily it is fast being obliterated.

SEEN IN GREAT BRITAIN'S SPRING SHOW

LONDON, April 13.—Cordingley's show, as the twelfth annual exhibition at the Agricultural Hall is generally designated, united about four hundred exhibitors, but had nevertheless quite a number of noticeably bald patches. Reo and Logan, the former with a pleasure car, the latter in the commercial vehicle section, maintained America's reputation for progressiveness. The Reo especially was a center of attraction, and the opinion was pretty generally expressed that its models would be hard to beat at the price. In a recent non-stop and flexibility run from London to Bexhill-on-Sea, a two-cylinder Reo made a very satisfactory performance, and placed itself high on the official list in a competition which distinctly favored powerful four and six-cylinder machines.

There are many here who fail to find a *raison d'être* for the independent show in the Agricultural Hall and would fain see the two exhibits united in one at the end of the year. Novelties are not expected here, for all firms from whom anything interesting is likely to come make a point of being ready for the winter exhibits. Its date, and the fact that there are always some firms behind time, give it ground for a continuance of its career. The man who is itching to exchange a handful of bank notes for a brand new automobile rushes enthusiastically to a show which opens its doors just as the winter frost is thawing out of the roads and spring breezes are calling to an open-air life. To the manufacturer who could not finish his models in time for the Olympia or the Paris exhibits, the spring friend is a friend indeed.

The exhibition is not representative of any one nation, for although England, France, Germany, America, Holland and Switzerland all have their representatives, not one of them shows more than a tithe of its products. The six-cylinder Spa, an Italian production, the Auto-Mixte and the Mercedes-Mixte, both gasoline petrol productions, the Nacke and the Horch are new to this country.

Some of the Leading Mechanical Features.

Among the aristocratic class of cars the new four and six-cylinder Spa machines, fresh from the Turin factory, attracted well-deserved attention. Standard European lines of construction are followed, cylinders being cast in pairs, valves on opposite sides, and induction pipe brought to a pocket common to each pair of cylinders in order to obtain equal fuel feed. The ignition is by low-tension magneto. Drive is by propeller shaft and live axle,

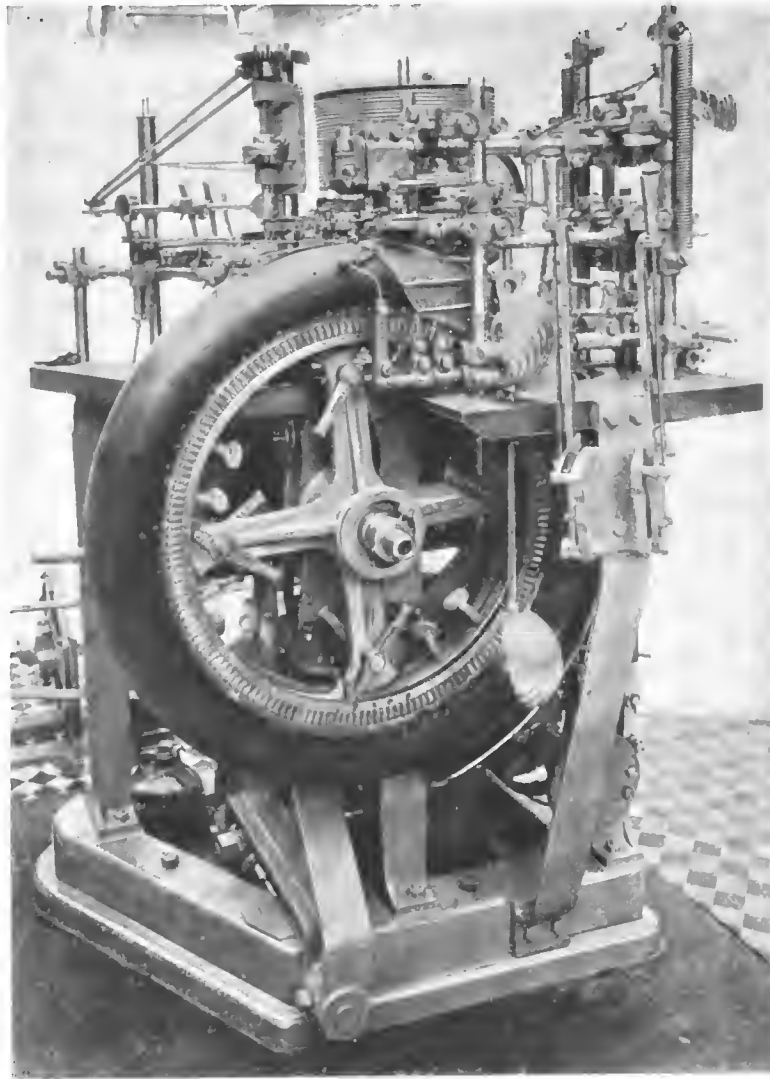
the torque rod and radius rods being of very substantial construction. Brakes, as is generally the case on high-grade Italian cars, are exceedingly powerful and are water-cooled and compensated. Those operated by the foot pedal are duplicated, one being on the clutch shaft and the other on the rear end of the gear shaft. Florentia, another Italian production, would enter in the same class as the machine just described. A six-cylinder chassis is exposed, with cylinders cast in pairs, valves on opposite sides, gear-driven Eiseman magneto on the induction side and

pump on the exhaust side, multiple disk clutch and four speeds and reverse. A very large inspection plate is provided on the gear box, equipped with a milled-head knob, a quarter turn of which will release the plate. The feature of the machine is the excellent rear suspension by three-quarter elliptic springs, and the diagonal frame stays at rear.

Novel features are found in the Porthos 24-32-horsepower chassis, with separately cast cylinders, valves on opposite sides and high-tension magneto. In addition to the fan behind the radiator the flywheel is vanned. Lubrication by means of a plunger pump sucking oil from a box on the dashboard and delivering it through a series of sight feeds is according to general practice, but is particularly ingenious in arrangement and design. The rearmost exhaust valve tappet rod is expanded near the top, so as to form a piston, the tappet guide being also broadened into a pump casing, with simple outlet and inlet ports, to which the oil pipes are connected; oil circulation thus must commence and cease

concurrently with the engine motion. The sight feed drips on the dashboard are jacketed by means of a by-pass off the water circulating pipes. There are entirely new features in the live axle. The differential shafts are split centrally in the usual manner and drive the wheels by dog clutches, but instead of the weight being carried on exterior sleeves, a solid rod completely passes from end to end through the differential and the hollow differential sleeves, and on this rod the road wheels are free to rotate. There is no exterior casing, the sleeves revolving in ball bearings suspended from three-quarter elliptic springs of ample dimensions.

Spyker, the well-known Dutch firm, has only made minor improvements to their excellent chassis. In the new model the dashboard is cleared of everything but a water gauge and a gasoline gauge, the dials of which are countersunk in the dash to



PRACTICAL DEMONSTRATION OF PALMER TIRE CONSTRUCTION.



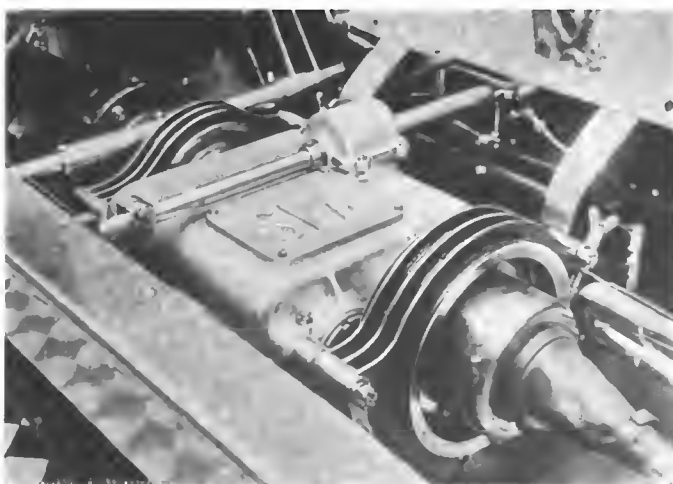
DISTINCTIVE FEATURES OF REAR OF PORTHOS CHASSIS.

protect them from injury. There is an ingenious arrangement on this car by which the leather-faced cone clutch can be disengaged with the minimum of exertion. A cross-bar level with the clutch shaft, with the end hinged to the side of the main frame, gives a very powerful leverage and enables the clutch to be withdrawn instantly by a touch of the toe.

There is a newcomer to this country in the Horch car, produced in Saxony. It has four-cylinder engine, cylinders cast in pairs; valves all on one side with overhead inlets having large bearings to the rockers. Ball bearings are employed for both camshaft and crankshaft. There is an original feature in the gasoline supply. The main tank at the rear is under pressure and feeds a small tank on the dashboard holding nearly a pint of gasoline. From this tank the fuel flows by gravity to the carbureter. The advantage is that there is always a quantity of fuel available for starting without pumping. There is a double universal joint between the clutch shaft and the gear box; the latter is of the double sliding type with an extra ball bearing on the direct drive shaft, so that no part of the divided shaft is unsupported. When the top gear is engaged the lay shaft is idle, the cardan shaft being in a casing hung in one line with the ends of the radius rod, hence the casing acts as a torque rod.

Useful Minor Improvements Are Numerous.

Among the improvements in detail, more numerous than changes in structural parts, there is on the Adler car a concealed trigger, covered by a hinged cap in the top of the change speed lever to prevent reverse being used unintentionally. Before reverse can be put in the cover must be raised and the trigger depressed. With this arrangement it is almost impossible to put the reverse in accidentally. The brakes are water-cooled and to obtain a flow of water all that is necessary is to depress a



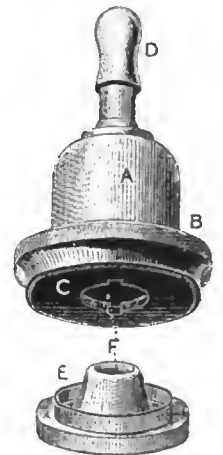
POWERFUL WATER-COOLED BRAKES OF S. P. A. MACHINE.

small toe pedal pivoted to the bracket of the foot brake pedal. The distinctive features of the Horseshoe car is a radiator in the form of a horseshoe. There is nothing to be said about the engine, but the type of the radiator gives the car a distinctive feature. On the Metallurgique, a Belgian machine, there is an oil splash guard above the flywheel. On the Unic car (Georges Richard) the oil reservoir to supply the sight feeds on the dash is carried inside the bonnet, thus maintaining the oil in a fluid condition in cold weather. On the Peugeot car a drain tap is fitted in the base of the gear box.

Petrol-gasoline vehicles were the feature of the exhibits in the heavy section. None of them are entirely new, though the Auto-Mixte and the Mercedes gasoline-petrol chassis are sufficiently novel to attract considerable attention. The principal features of the Auto-Mixte, a Belgian production, are the use of a dynamometer, an electro-magnetic clutch, a compact set of accumulators and an electrically controlled carbureter. Braking is also electric. Omnibuses are particularly prominent, for the Britisher has implicit faith in this vehicle to solve the transportation problem in great cities. There are more examples of the commercial vehicle for passenger service than for transporting goods.

What the Accessories Section Offers.

The inventive genius gives his fancy full play on the thousand and one accessories, which, though not forming a fundamental part of the car, would leave the automobile in a very pitiable condition if they were withdrawn. A few of them were good; the majority were of doubtful utility. In the former class can unhesitatingly be placed the Ripault combination valve grinder and remover. The tool, which is of French origin, has already been described in *THE AUTOMOBILE*. It is a simple kind of brace which compresses the valve spring and allows the valve to be withdrawn without difficulty. For grinding valves a screwdriver blade is slipped into the brace. The same agent shows a ratchet which enables the jaws of the spanner to be set at any desired angle to reach nuts in awkward positions. There is an excellent



NEW TYPE VALVE; CONNECTOR.

idea in a universal tire valve connector which has simply to be placed over the valve, requires no screwing, cannot come off when pumping, does not leak and fits any size valve. This little device was exhibited two years ago by a French mechanic in an unpretentious inventors' exhibition in Paris, but this is, we believe, the first time it has been offered to the public. It consists of a cup-shaped metal vessel surmounted by tube *D*, to which is attached the rubber tube connected with the pump. The base of the cup is closed by the piece *E*, of best quality rubber, held in position by plate *C*, fixed in place by the nut *B*. The rubber washer *F* has a hole in its center through which passes the valve. The cup-shaped terminal being placed over the valve, the rush of air presses the part *F* of the washer on the valves and prevents any leak. As is self-evident, the greater the air pressure the more firmly will the washer be pressed on the valve.

Among the speed and distance recorders is an interesting instrument shown by the Cowley Engineering Company. In addition to the ordinary speed and distance marking, there is a dial on which is recorded the speed maintained during the preceding half-mile. This serves as very useful evidence in unjust police proceedings. The record is traced by white pins, which take up their position in segmental slots in the black center dial. The apparatus is worked positively, by the usual type of linked chain.

S. Smith & Sons, of speedometer fame, have a big show of their specialties, among which may be mentioned a combination compass, barometer, speedometer and clock. The barometer, speedometer and clock are in one line on a polished board and the compass is suspended in a circle above them. There is a

well-designed folding canvas bucket with handle and lip complete, shown by the French Motor Accessories Company. The Stepney spare wheel has been before the public long enough not to be classed as a novelty. An improved type is, however, shown for the first time. The spare wheel clips onto the rim and is held there securely, while leather straps round the spokes prevent creeping. The new type is adjustable to fit any size wheel. When a puncture occurs the Stepney wheel is placed in position, an operation of three or four minutes, the punctured tire is left in its place and the journey finished with the makeshift.

The popular exhibit in the accessories section is the Palmer Tire Company's new automatic machine for making Palmer cord tires. As will be seen from illustration, the tires are made of layers of rubbered cord. It is claimed that the triple grooved pattern will not skid until the tread is worn and that the tread can be remade at little cost. The distinctive feature of the Vivian non-skid tire is that it is composed of alternating sections of hard and soft rubber. Elastes occupies a rather prominent position in the exhibition, though it cannot now claim to be a novelty; it may, however, be new to home readers. Instead of an air chamber, the outer shoe envelops a roll of composition composed of gelatine, glycerine and chromate salts, made to any consistency to suit cars of various weights. The composition bears a very close resemblance to the material used for making printers' rollers. Punctures are of course impossible and there is not any noticeable alteration in the resiliency of the tire. The makers declare that it prolongs the life of the outer shoe. America's share in the accessories section is the Rushmore lamp and a number of lubricating oils shown by British agents. Rushmore, who is as well known here as over the water, had as an attraction a large naval searchlight projector, working on the same principle as the smaller automobile searchlights.

LONDON-PARIS WEEKLY AUTO SERVICE.

LONDON, April 13.—In a few days Londoners will be able to visit Paris in a much more agreeable manner than by the Southern British and Northern French railroad routes. Starting on May 3 there will be a regular weekly automobile service between the two capitals by means of a 50-horsepower Gobron Brillie touring car. The automobile, with five passengers on board, will start from the Carlton Hotel at 8 A. M., call at the Ritz, in Picadilly, fifteen minutes later, and proceed by way of Maidstone to Folkestone, arriving in time for the 11:30 boat, reaching Boulogne at 1:30. The machine will immediately proceed for Paris by way of Abbeville, Grand Villiers, Beauvais, and Pontoise, reaching the Ritz Hotel about 8 o'clock. After a week-end in the gay capital, the party will leave for London on Monday morning, arriving same evening.



EIGHT-CYLINDER ENGINE PRODUCED BY ALL BRITISH COMPANY.

NOVEL BRITISH EIGHT-CYLINDER ENGINE,

LONDON, April 13.—As a mechanical novelty there was nothing in the Agricultural Hall show quite so interesting as the eight-cylinder engine built by the All British Company. The illustration given herewith furnishes a good idea of how the huge machine looks. The purpose for which it is to be used was not disclosed. It is not a stationary engine, it is too big for a car and it is far removed from the general marine type. It will be noticed that the cylinders, which are cast in pairs, are in two lines, with the crankshaft centered between them in an exceptionally deep crankcase. Instead of the usual connection with the crankshaft by means of a connecting rod, the connection on this engine is by means of rocker arms and connecting rods, as employed on the Arrol-Johnston machines. Valves are all mechanically operated, the inlet valves being in the heads, operated by rocker arms, and the exhaust valves in pockets on the sides. The throttle control is a distinct departure from standard practice. It consists of a system of cams by which the driver is able to entirely cut out of operation one, two or more cylinders, according as he desires to reduce power, the remaining cylinders always working with a full charge and constant compression, and therefore under the most favorable conditions for economy. Ignition is by high-tension magneto mounted on a bracket to the rear of the engine and above the top of the crankcase. Very large inspection plates are provided on the sides of the crankcase.



SIX-CYLINDER FLORENTIA CHASSIS, ONE OF THE ITALIAN MASTERPIECES AT THE LONDON SHOW.

LETTERS INTERESTING AND INSTRUCTIVE

Regarding Intake Leads and Their Equalization.

Editor THE AUTOMOBILE:

[715.]—I am designing a six-cylinder automobile engine, and find myself at a loss in reference to the arrangement of the intake piping. I want to get the distance from each cylinder to the carbureter as nearly equal as possible, so that all of the cylinders will develop the same power. I also want the leads to be as short as possible, so that there will not be any considerable volumes of mixture between the carbureter and the cylinders, to attenuate when the engine is speeded. Is it possible so to equalize the intakes of a six-cylinder engine that they will feed the cylinders as evenly as can be done with a four or eight-cylinder engine? What do you think of the advisability of using more than one carbureter on an engine of the sort I have in mind?

A. R. W.

Pontiac, Mich.

If you mean that you require an intake piping of perfectly symmetrical form, such as the single, double and triple Y's used for four and eight-cylinder engines, we can say at once that nothing of the sort is possible. Very good approximations are secured, however, in feeding the fuel to most six-cylinder engines by arrangements that compensate for differences in distance and directness of fuel flow. You will find many interesting examples among the best modern six-cylinder machines, which it will repay you to study. The distance from a carbureter to the cylinder or cylinders at feeds always should be as short as possible, because of the effect you mention. But it is, of course, impossible to secure very remarkable results in this respect with a six-cylinder engine fed by a single carbureter, and it probably is a fact that few multi-cylinder engines develop the same power in each cylinder. The use of a plurality of carbureters, though it has been suggested by at least one exceedingly prominent European designer and builder of cars, is open to the objection that it is practically impossible to adjust even two similar carbureters alike, so the unequal feeding of different cylinders by no means is done away with by this scheme.

The Position of the Spark Plug.

Editor THE AUTOMOBILE:

[716.]—If it is not too much of a demand upon your space, I wish you would let me know through your columns what is considered the best point in the cylinder for the spark plug. That is, should it be located exactly in the center of the combustion space, or is it all right to have it to one side, as is the case in so many cars? Is it really an important advantage to ignite the charge in the middle, so as to get it consumed in the quickest time possible?

Milktown, N. J.

ARTHUR BEVERIDGE.

A very little study of modern automobiles will convince you that there is no agreement, among those best qualified to judge, as to the best position for the spark plugs. Some makers place them in the centers of the cylinder heads, others place them over the inlet valves, others still place them in the sides of the cylinders, and a few prefer to locate them by the exhaust valves. It is on purely theoretical grounds that the center of the combustion space is held to be the correct location for the ignition to start from. Practically, no such great advantages as this argument assumes are shown to exist, since the rate of flame propagation in an explosive mixture of the sort used in an automobile is in the neighborhood of 3,500 feet a second against a piston speed of not over 1,500 feet a minute. The result is that no matter where ignition is commenced, the combustion is sure to be accomplished quickly enough for any practical purpose. You will find that most automobile designers who place the spark plug in the center of the cylinder head do it primarily for other reasons than the one you seem to regard as most important. For instance, the reason usually given for placing the plug over the inlet valve is that, in this case, when the spark occurs, it is more likely to be in fresh mixture than if at some other point, where retained exhaust gases might be pocketed. The argument for the exhaust valve placing is the scouring action of the hot gases.

A Query Concerning the Proper Mixture.

Editor THE AUTOMOBILE:

[717.]—Under the head of Letters Interesting and Instructive, will you kindly let me know about the following?

On a two-cylinder, 20-horsepower car I occasionally shut off the gasoline supply at the tank, when in the barn after a run, and allow the motor to run until the carbureter empties itself with the motor running. I notice that just before the supply is exhausted the engine speeds up very materially, increasing its revolutions per minute considerably, although the spark advance lever remains at the same position—the effect is the same as if the spark were greatly advanced. Does this indicate that I am using too rich a mixture while on the road?

(2) Theoretically, should a richer or thinner mixture be used in hot weather as compared with cold weather, assuming the humidity to be the same?

(3) Does the theoretical answer to the last question hold good in actual use and practice?

MIXTURE.

Walden, N. Y.

As you surmise, this action of the engine would undoubtedly seem to be due to the better-proportioned mixture created when the fuel is just about to give out. Your running the motor in this fashion, *i. e.*, allowing it to empty the carbureter after the gasoline supply has been cut off, also serves to disprove some of the many fallacies regarding the necessity of minute adjustment of the gasoline level in the float chamber. We should say that this action did indicate the fact that you were using too much gasoline under ordinary circumstances, but when running on the last drops of fuel in this manner the engine will at a certain point be receiving a theoretically perfect mixture, which will be difficult to more than approximate by carbureter adjustment. Further, the engine will continue to run for a short time on a mixture far too weak for starting or ordinary running, as it is running light and everything is hot—conditions conducive to the use of a very weak mixture, so that it will not pay to attempt to get the carbureter adjustment too fine.

(2) As it is possible to run the engine on a far weaker mixture than is ordinarily available, when everything is hot, and as the engine naturally tends to run hotter during warm weather, we should say that the use of a weaker mixture in summer was in conformity with theory in this regard.

(3) In a certain sense, it does. That is, with stationary engines like the Deutz and the Diesel, using an extremely high compression the weakest possible mixtures are used, demonstrating that the high temperature will satisfactorily burn a mixture that otherwise would not ignite. These engines are about the most economical in fuel consumption that have ever been built. Concerning the automobile alone, however, we doubt if many autoists find that a distinctly different carbureter adjustment is needed in warm weather as compared with cold. On the other hand, it is a matter of common knowledge that the average driver runs his car on a mixture that is more or less too rich in gasoline, and frequently very much too rich. The latitude of adjustment under which the engine will function satisfactorily is accountable for this.

Distribution of Water in Radiators.

Editor THE AUTOMOBILE:

[718.]—I have a water-cooled car, built two years ago, which is causing me considerable trouble by overheating when the weather is the least bit warm. I have examined all of the usual causes of such a difficulty, but the only thing I can find wrong is the radiator, which becomes hot at the center, while remaining cool at the sides, whenever the motor is run for a while. The radiator is of the vertical wavy-tube type, resembling a honeycomb in its general appearance. I do not know whether it used to vary in temperature as it does now because I never examined it before for any similar trouble, but I do know definitely that something is wrong, for with exactly the same fittings and under similar conditions the car used to run all right. Should there not be some sort of baffle plates in the top of the radiator, to distribute the in-

flowing water in such a way that it will not run right down the nearest tubes? I have an idea that there once were such baffle plates, but that they may have been corroded out or through by an anti-freezing solution I used last winter. I do not think that the radiator tubing is obstructed, because the flow of water through the cooling system seems quite unimpeded, which I imagine would not be the case were there deposits clogging the tubes.

St. Louis, Mo.

DR. LEONARD DECKER.

It looks as though at least part of your troubles were due to some obstruction in the tubing, whether there are damaged baffle plates or not. It is not disproof of this that the water seems to flow freely, for the water space in a radiator of the type you describe is much greater than the cross-section of the piping used in the cooling system. In some early cars not enough attention was paid to the distribution of the water into the radiator, and it is possible that the design of your car may need some correction in this particular. The water should enter, of course, at the top of the radiator, so that it will flow down as it cools. From the main intake there should be separate internal channels to divide the stream and conduct its parts each to a particular group of the cooling tubes. If all this is lacking it will hardly be possible to supply it except by sending the radiator to the manufacturer for the required alterations, for assembling and soldering a radiator is an exceedingly difficult job, scarcely to be tackled except by an expert. To remove any corrosion that may be present, fill the radiator with a caustic-potash solution or a ten-per-cent. solution of sulphuric acid in water. Both of these are powerfully corrosive, so must be handled with caution and not left in the radiator too long. After draining them out repeated rinsings with clean water should follow.

How to Charge Accumulators from Gravity Cells.

Editor THE AUTOMOBILE:

[719.]—Can you or your readers give me any data or directions in regard to charging a six-volt storage battery from gravity cells such as are used in telegraph work? I understand this is done in Europe, but have not heard of its being used in this country. Any information you can give me will be greatly appreciated.

W. J. C.

Aqueduct, N. Y.

Charging accumulators by means of gravity cells can be done without any difficulty, but is a rather slow and somewhat expensive process. The gravity cell only has an output of .4 to .5 ampere at .9 to 1 volt potential. As your six-volt set of accumulators is probably either of 40 or 60 ampere hour capacity, it will be readily apparent that quite a few cells of gravity battery will be required if the charge is to proceed at a reasonable rate. While under charge and approaching saturation the storage cell reaches a voltage of 2.5 or slightly over, so that in order to be on the safe side at least 10 cells of gravity battery would have to be connected in series. The current available would then be .5 ampere at approximately 10 volts; if your accumulator is of 40 ampere capacity it would require 80 hours or more to charge it, and if of 60 ampere hour capacity 120 hours or over—in other words, the better part of a week in the latter case. The time can be shortened by providing another set of ten gravity cells connected in series and the two sets connected in multiple, the available output then being one ampere at ten volts, which would cut the length of time required for charging approximately in half.

The cells should be of the 6 by 8-inch size and they must be placed on a solid foundation where they will not be subject to even slight disturbance, as this will interfere with their working. Unfold the copper strips in star shape, place in the jars and cover with about three inches of water, then pour in three to four pounds of sulphate of copper (bluestone); hang the zinc from the edge of the jar and fill with water to within an inch of the top. To render the cells active without delay, five ounces of sulphate of zinc should be added to each and the whole battery placed on short circuit—i. e., connect copper terminal of one end cell to zinc of opposite end; a teaspoonful of sulphuric acid per cell may be employed in place of the sulphate of zinc. As soon as the cell is working satisfactorily the separating point of the

two solutions will be clearly defined, the upper being colorless and the lower a deep blue. At least twenty-four hours on short circuit will be required before the cells give their normal output; the cells should never be disturbed. To keep the cells up to maximum efficiency they should be tested with a hydrometer every week or two; the upper solution should allow the instrument to sink to 25; if heavier, draw some off and add clear water until this point is reached. If the zinc becomes badly coated it must be lifted out and scraped and washed; fresh bluestone should be added as needed by dropping in carefully a little at a time. Trouble arising from evaporation, dust and creeping of the salts may be prevented by pouring about half an inch of heavy paraffine oil on the top of each cell.

Remedying One Evil Apt to Bring On Another.

Editor THE AUTOMOBILE:

[720.]—I note in your issue of April 4, letter No. 681, in which Mr. MacArthur suggests a method for preventing carbonizing of a motor. Doubtless Mr. MacArthur's method will prevent carbonization, but I think there is a great drawback to this method. If you should raise a cylinder one-quarter inch as is suggested, it would greatly decrease the compression of the motor. For example, take a motor with a bore and stroke of four inches. Take the compression space as 30 per cent. of the volume displaced by the piston, which will be 15.08 cubic inches. Now, if the cylinder is raised one-quarter inch it will increase the compression space 3.14 cubic inches. Adding this to the former compression space we have a total of 18.22 cubic inches. Assuming the compression to be about 66 pounds for 15.08 cubic inches, it will decrease proportionately for 18.22 cubic inches. Therefore,

18.22:15.08::66:55.

Then, the difference between 66 (the compression at first) and 55 (the compression after raising the cylinder one-quarter inch) is 11 pounds, which I should think would cause considerable loss of power.

I think if anyone were to try this method it would be advisable to fasten a metal plate, equal in volume to that gained by raising the cylinder, to the cylinder head.

HOWARD EDDY.

Hartford, Conn.

We presume the evident intention of our correspondent, Mr. MacArthur, was mainly to point out to the designer the error of his ways in this respect, and to recommend that the engine be so constructed that the piston should not rise into the counterbored space in the combustion chamber, which, of course, would be the best preventive. That the expedient of raising the cylinders of an engine already in use, which he suggested as a cure, will result in the evil you speak of, goes without saying. Of course, it can be overcome by the insertion of a metal plate in the head, of a thickness equivalent to the difference caused by the elevation from the crank-case, but it strikes us that this is an extremely laborious method of beating the devil round the bush, merely to overcome what ought to be preventable by far simpler and less expensive means. With the proper quantity and quality of lubricating oil and the proper fuel mixture, it certainly should not be necessary to dismantle an engine more than once a season—and that at the end, on this account. The fact that there are thousands of gasoline engines of the stationary type that run 10 to 12 hours a day and six days a week, most of the time under full load, without suffering from this cause, shows that the average autoist still has a great deal to learn on this score.

Some Queries Regarding Proper Lubrication.

Editor THE AUTOMOBILE:

[721.]—Please answer these questions in the columns of your valuable paper: (1) What is the best method of determining the proper amount of cylinder oil to feed cylinders of two-cylinder-opposed motor? (2) Am at present using light Monogram. Under the same conditions, should I feed more light oil than medium? (3) Should I feed less oil to rear cylinder than front, and why?

Kingston, N. Y.

JAY TERRY.

It is difficult to lay down a general rule for determining the amount of oil to be fed to a motor when the only data given is that it is of the two-cylinder opposed type. The power and speed at which it runs are both important, as well as the manner of cooling, air-cooled motors requiring more oil of a higher fire test

than water-cooled motors. It is customary for manufacturers to state in their instructions accompanying the car, just how many drops per minute should be fed from the different cups. Failing this, they should be adjusted to deliver just sufficient to keep the various parts of the motor well-lubricated; in the case of the connecting rods and pistons, this may be determined by setting them at a certain point—10 to 15 drops per minute should come near the correct quantity in your case, as the double-opposed type of motor usually runs at a comparatively low speed, and noting the effect. Should this quantity prove excessive, the result will soon be noticeable at the exhaust, as the surplus will burn in the cylinders and produce a bad deposit of carbon unless corrected. In order to determine whether it is sufficient or not, clean out the crank-case, fill with fresh oil to proper level, which should be just so that big-ends dip in it about half an inch on the lower part of their sweep, set the feed as already mentioned, and at the end of two or three hours running—not long enough to endanger the motor should the feed be insufficient—inspect the crank-case interior again and note whether the amount has unduly diminished or increased. In this way, it should not be difficult to ascertain just how much oil is required to keep the interior of the motor properly lubricated. In the case of out-board bearings, the condition in which they run will be indicative of their lack or excess of oil; the makers usually provide oil or grease cups of a capacity calculated to last each particular bearing a certain length of time, and if they are kept filled, there is little to fear from hot bearings.

2.—The amount of oil necessary will naturally differ with the quality, but if the light oil you speak of is better adapted to the purpose than what you were previously using, it will probably require less rather than more of it.

3.—We cannot conceive of any reason why the rear cylinder should receive less oil than the front, unless the engine does not happen to be levelled on the chassis and the oil tends to flow toward the rear cylinder at all times. Under normal conditions, both cylinders should receive the same amount of oil.

How Some Cars Dispense with the Differential.

Editor THE AUTOMOBILE:

[722.]—Will you kindly enlighten me as to the following through the columns of your valuable magazine:

In your April 11 issue I read an article regarding this year's Grand Prix to be run in France next summer, and I notice that the Darracq and Renault racing cars are being built without differential. Will you kindly state how this can be possible.

New York.

DAVID F. LADIN.

The three Darracqs, the three Renaults and the Christie racer in the French Grand Prix are without differential. The American machine with its front drive is, of course, in a class by itself, but the two other makers follow established custom excepting that they have cut out the differential. Drive in each case is by propeller shaft and bevel gears to one-piece rear axle; the only difference between the racers and the touring cars of these makers is that the axle is undivided by a differential. A saving of weight is obtained by suppressing this organ, but the chief advantage, the makers declare, is that the rear wheels hold to the road better. The Renault racer with which Szisz won the Grand Prix last year and the Darracq machine with which Wagner captured the Vanderbilt Cup were both minus a differential.

EXPLAINING THE ACETYLENE MYSTERY.

Editor THE AUTOMOBILE:

[723.]—In your "Letters Interesting and Instructive" department, in the issue of "The Automobile" of March 14 last, I particularly note letter from B. A. Birtiss (Number 636), descriptive of his experience with explosions in copper tubes connecting acetylene with lamps.

I beg leave to suggest that copper acetylide is a very dangerous and highly explosive fulminate formed by the combination of the acetylide of copper and oxide, the explosion being due to the effect of bending the pipe the same as would be the case in the presence of dynamite. I should also beg leave to suggest that an article by some chemist familiar with this matter would be a most excellent one for publication in "The Automobile."

As the formation of copper acetylide and subsequent dangerous explosions thereof are an ever-present possibility with acetylene generators, conducting pipes and lamps as now used on automobiles, possibly the makers of acetylene gas generators may be able to offer some suggestions as to the prevention of difficulties of this kind.

L. P. LOWE.

San Francisco, Cal.

ADVANTAGES OF MAGNETIC GASOLINE GAUGES.

Editor THE AUTOMOBILE:

[724.]—An article in the "Horseless Age," under date of April 10, under the heading "A Suggestion for Maintaining a Reserve Supply of Gasoline," while instructive to novices in automobiling and motor boating, is hardly up to the time, and puts one in mind of the dog barking up the tree after the coon has left.

There was a time, but in the dim past, when articles advising as to the particular class of wood and shape of stick to be selected for measuring gasoline in a tank, and articles advising motorists to carry along an extra jug which, while never taking up any room always managed to be in the way and constituted an eye-sore, and also suggestions as to reserve tanks, may have constituted interesting reading. If the writer may make a suggestion, it would be that many wise people have learned that the installment on the tank of a magnetic gauge such as the Triumph, used by Pierce-Arrow, Matheson, Knox, Stearns, Northern, L. S. Ross, Marmon, Moline, and other high class cars, and by the S. F. Bowser Company on their gasoline storage outfits, represents the advanced line in taking care, in a practical way, of the gasoline supply. The stick which many use invariably introduces dirt in the gasoline, and the evaporation of the gasoline from the stick frequently requires a chaser to find the gasoline mark on the stick. So, too, the reserve tank may be compared to an old-fashioned engineer who suggested a device to operate a whistle that the brakemen might apply the brakes and stop the train, thereby notifying the engineer that water was actually needed in the locomotive boiler, and in this case the stop would be made irrespective of the location of the water supply. An Eastern man might consider the stopping scheme suitable for the B. & A. road, but a modern engineer prefers a reliable gauge, a glance at which will show the water conditions long prior to an emergency, and not necessitate a stop.

If a gauge is necessary on a locomotive boiler, certainly a reliable tank gauge is a practical necessity on the gasoline tank of an automobile, not only for the comfort and convenience of the user of the car, but because a glance at the head of the gauge will render it unnecessary to stop the car when in doubt as to the quantity of gasoline to complete a run. It appears to the writer from his own experience, that too much cannot be said in favor of the installment on every gasoline tank of a reliable magnetic gauge, and further, the use of such a gauge results in lessening the amount of money paid for gasoline when touring, as it acts as a faithful bookkeeper.

C. E. C.

Boston, Mass.

FROM THE BRASIER REPRESENTATIVE.

Editor THE AUTOMOBILE:

[725.]—A clipping has been sent to me, by the Brasier firm, which appeared in your paper March 21, page 532, under the head of "Gustave Chedru Joins Thomas Company." Mr. Brasier states that the information which you have in this article is wholly and absolutely incorrect, in so far as Mr. Chedru's connection with the firm is concerned. Mr. Brasier states that Mr. Chedru at no time was chief engineer, and at no time was chief designer, or at no time held any principal place in the Brasier factory; and he further states that Mr. Chedru never designed or had any principal part in the design of any Brasier racing machines.

Mr. Brasier further states that Mr. Chedru stayed with the Clement-Bayard people for three weeks, and this was his total connection with that firm. That as to his being chief engineer in the Brasier firm, his position was simply that of draftsman, and that his work comprised nothing further than the carrying out of explicit instructions.

I would be very glad, in view of the above, if you would give sufficient prominence to Mr. Brasier's statement herein contained, as it is wholly unfair and unjustifiable that this man should be sailing on the laurels of the Brasier firm and be credited for work which he has never done.

It is all very well to damn the French car, and state how fine the American car is, and there is no question that a good many of the American cars are really good, but it is absolutely wrong, in my estimation, to steal any man's thunder and to take one of the best machines in the world and try to build up the reputation of an American machine on the already made reputation of a high-class foreign car. I kept still during the last campaign of free advertising on the Brasier reputation, but I do not propose, at the present time, to keep quiet any longer.

E. B. GALLAHER.

New York City.

DOING AWAY WITH THE DUST NUISANCE.

Any preparation which will remove the dust nuisance will be heartily welcomed by the automobilist. But to be generally adopted such preparation must be cheap, easily applied, lasting, have no injurious effects on tires, nor be harmful to the eyes. Rather more than a year ago a coal tar preparation known as Tarvia was introduced to the public and has since been used on more than 800,000 square yards of road with very satisfactory results. The roads were located in thirty different cities in various parts of the country and some of the work was done in Jackson, Tenn., under government supervision.

Tarvia is a coal tar preparation which can be applied to the surface of a macadam road in such a way as to unite the top dressing into a waterproof bonded surface which will not disintegrate into dust. The method of treatment is as follows:

First, the road to be treated should be a well built, firmly bonded macadam in fairly smooth condition. If the road to be treated is a new one, it should be built in the usual manner, and, after the road is puddled, sufficient screenings spread over the surface to protect it against raveling by the traffic; allow the traffic to use for two to six weeks or until the road is thoroughly dried out, when the screenings which are not bonded should be removed, leaving exposed the inch or inch and a half stone which forms the wearing surface.

If it is an old road which is being treated, all screenings, dirt, etc., which are over the inch or inch and a half stone, whichever is used for the wearing surface, shall be removed, either by sweeping, or by scraping if the screenings are caked. Many roads are maintained by keeping from 1-2 to 1 1-2 inches of screenings which have passed a quarter or half-inch mesh caked on the surface by continually wetting and rolling, and it is absolutely necessary that these should be removed in order to make a satisfactory job. If they are not removed, the result is that as soon as these screenings are dry the adhesion is destroyed and the screenings become entirely loose, thus breaking the entire tarviated surface; consequently they must be removed, even if necessary to scrape. After the macadam is thoroughly cleaned and perfectly dry, it is coated evenly with Tarvia heated to a temperature of from 160 to 180 degrees Fahrenheit, using from 1-3 to 1-2 gallon per square yard. Various methods of heating have been used, namely, tank wagons holding from 500 to 600 gallons, with fire boxes, roofing kettles mounted on wheels, and in many places the work has been convenient to the factories, so that the preparation is delivered hot direct from the factory and no heating is required.

Sprinklers for distributing from the tank wagons, made with pipes with slots and small holes, have been used in the hopes of doing away with the sweeping, but so far nothing of the kind has given sufficiently even distribution. The most satisfactory method has been to use a hose attached to either the tank wagon or the roofing kettle, allowing the Tarvia to flow from the open end onto the road, and sweeping with street sweepers' fiber brooms.

After the Tarvia has been allowed to penetrate the road for from two to twelve hours, it is covered with an even layer of crushed stone screenings, which have passed a quarter or three-eighths inch mesh, with not more than 50 per cent. fine material. The entire surface is then rolled, with steam roller if possible, and if there are any black spots showing through the screenings behind the roller additional screenings should be applied, and again rolled until the black spots do not show after the rolling. After a period of from two to six weeks, depending somewhat on conditions, the loose dust and screenings which have not been bonded can be removed, leaving the surface perfectly smooth and clean. The first application of Tarvia generally makes the road dustless for about a year. Applications thereafter are necessary every two years, less and less of the preparation being used.

THE TURRET LATHE FOR CYLINDER BORING.

Several interesting features of the latest methods in use for boring cylinders for automobile engines were brought out in a chat with one of the best-known builders of boring mills, says I. B. Rich, in *The American Machinist*. Feature No. 1 was that while many boring mills were still used for this work, the tendency was to get away from them to something that would give good results and faster time. So the boring mill is to some extent giving way to the large turret for this work. The cylinders are roughed out with an ordinary boring bar having a flat cutter keyed through its center. This bar is held rigidly in the turret and supported at the outer end where possible. This rough bores in very quick time. Then the cylinders are laid aside for a day or so to allow the internal strains of the castings to relieve their pent-up emotions before being finished in the same machine. The finishing cut is taken with a two-bladed boring bar, which is adjustable for size, but in this cut the bar "floats," being connected through a flexible joint. This produces a good cylinder. It emphasizes two principles. One is the best work of this kind cannot be done at one setting, but that the iron must have time to adjust itself before the finishing cut. The other is that for the finishing cut the boring bar must not be rigid.



A STRETCH OF PICTURESQUE ROADWAY ON THE MONTGOMERY TURNPIKE AT ROSEMONT, PA., RECENTLY TREATED WITH TARVIA.

THE COST OF AUTOMOBILE RACING

OWING to the widely differing nature of the regulations governing the important European road races this year, automobile manufacturers are called upon to spend a larger amount of money on racing than before. Competitions are in a transition stage. Three years ago the 1,000 kilos weight limit was applied to the Gordon Bennett, the Ardennes race, the Brescia circuit, and the Vanderbilt contest. When the Gordon Bennett cup was sent to the museum new racing rules were spoken of, and last year the French club broke away from old conditions when it announced that its 1907 race would be held on a limited fuel allowance. Other clubs dropped their orthodoxy with the result that now not a single race in Europe is being run on the old regulation limiting weight to 1,000 kilograms. For the Grand Prix a gasoline allowance of about one gallon per ten miles is allowed; the Ardennes circuit limits the cylinder area and fixes a minimum weight; the German Emperor's cup is run under the same regulations as its Belgian companion; and for the Targa Florio there is a limited bore and stroke together with a minimum weight. The Brescia circuit, which is to be revived this year, will probably adopt the same regulation as the Ardennes and German Emperor's cup. The Vanderbilt race still remains in a doubtful state so far as governing regulations are concerned. Probably in a year or two international committees will have mutually agreed on the ideal type of rules for road races, and a car built for one race will be eligible for all other big contests throughout the world.

This year manufacturers are obliged to build three different types of racing machines to suit the different regulations. Several French firms making a point of being in every speed contest, have built one set of machines for the Grand Prix, another for the German Emperor's cup, and a third for the Targa Florio. Thus their already high racing expenditure is now trebled. It is interesting to inquire how much is spent in this fascinating but costly struggle. Paul Meyan, who has closely studied this question, gives \$102,400 as the total racing expenditure for any firm taking part in the six most important road races of the year: Targa Florio, German Emperor's cup, Grand Prix, Ardennes Circuit, Brescia Circuit and Vanderbilt cup.

There are three distinct regulations, therefore three separate types of machines must be built, nine in all. Designing may be put down at \$600; models would cost about \$1,000; for raw material, iron, steel, aluminum, etc., \$9,000 must be calculated. To turn all this raw material into finished parts expensive machine tools and skilled workmen are required, the cost of which cannot be calculated at less than \$2,000. Finally all the parts are ready and assembling begins. This would occupy about 3,000 hours' work, worth \$600 on the French scale. The three racers completely finished, they are sent on the road to undergo a 1,000 miles test, enter the factory again, are dismounted, modified, re-assembled, and finally tested. This work cannot be valued at less than \$1,800. To recapitulate, the factory expenses are:

Designing	\$ 600
Models	1,000
Castings and raw material.....	9,000
Machining	2,000
Assembling	600
Testing	1,800

First total\$15,000

As there are three different types of cars to build for 1907 this total must be tripled, giving \$45,000.

Engagement fees for the Targa Florio, German Emperor's cup, Grand Prix, Ardennes Circuit, Brescia, and Vanderbilt cup, supposing the maximum number of cars are entered for each contest, would call for an expenditure of \$9,400. Drivers, ma-

chines, attendant workmen and stores must be sent to Sicily, Germany, France, Belgium, Italy and America. These expenses cannot be calculated at less than \$3,000 per race, making \$18,000 for the six world's races. Insurance of drivers and material may be estimated at \$200 per car and per race. As there are eighteen racers the total would be \$3,600.

Nothing must be left to chance, consequently all necessary material, gasoline, oil, tires, etc., are transported to the scene of each race at a cost of \$2,400, or \$14,400 for the six races. Adding the items together, we get:

Engagement fees	\$ 9,400
Traveling expenses	18,000
Insurance	3,600
Material and stores.....	14,400

Second total\$45,400

Participation in a big race involves more or less advertising; the amount varies considerably according to the value laid upon this item by the interested parties, but \$12,000 is only a very modest estimate.

The total expenditure for the racing season thus evolves itself as follows:

1. Constructing machines.....	\$45,000
2. Racing	45,400
3. Advertising	12,000

Total\$102,400

These figures are based on the assumption that the firm will enter in all the six important races to be held in Europe and America this year. In reality only three French firms have made arrangements for such an elaborate program. There will, however, be ten firms in Europe which will incur an expenditure of sixty to seventy thousand dollars this year for racing alone. The amount is higher than it need be owing to the disagreement on racing conditions, but it is a very small amount compared with the volume of business done by the world's important factories. The leaders of the industry, in Europe at any rate, are convinced that the lessons learned in automobile construction as the result of the fierce struggle, and the advertising value of the races, are well worth the expenditure which they involve.

AERIAL TRAVEL IS ALSO COSTLY.

PARIS, April 13.—There does not appear to be much that is of great value in the huge, lightly constructed, canvas covered frames which scutter about on the Bagatelle polo ground in the early morning or as shades of evening are falling, like huge birds deprived of their natural powers of flight. There is only a light frame, generally of bamboo, with a covering of parchment, linen or thin wood, a mass of wire stays, a gas engine and a propeller. Yet this simple looking machine will have cost its ambitious owner not far short of \$4,000. The big frame cost about \$1,000 to design and construct; the propeller is worth \$160; the motor cannot be valued at less than \$1,600. Wheels, transmission gear, accessories, repairs and wages of attendants will round up the sum. Santos-Dumont is constructing his sixteenth machine and half a dozen more aeroplanists have built more than four each. An estimate of the amount spent by these leading figures in the world of flight can thus be easily arrived at.

Dirigible balloons are much more costly and quite out of the reach of the ordinary mortal. The *Patrie*, which the Lebaudy Brothers sold to the French Government, is valued at \$70,000. Two other steerable balloons of the same style have been ordered at \$52,000 each. The steerable balloon with which Walter Wellman hopes to reach the North Pole cost a paltry \$28,000.



ployed in the selections. To appear fetching in auto garb is largely a matter of millinery. Given a becoming hat and veil, a woman cannot help attracting favorable comment.

Modish women automobilists are fond of the little French hats with peaked fronts or soft brims that may be adjusted to suit the individual. Some of these have pongee or crêpe de chine curtains with long ties, while others equally as smart are held in place by big square veils arranged in any desired fashion. These veils measure two yards each way and are found in a large range of attractive combinations. A stunning veil of this type is deep cream color with cardinal polka dots and two-inch border. Another in white decorated with empire green is shown among the stylish effects. A five-yard-long veil has a white silk mesh center with brown chiffon ends; the white part is intended to cover the face and the ends arranged over the hat and hair ending in a big bow at the throat.

THERE'S no diminution in the cry for smart clothes for use in automobiling. With enthusiasm affecting a growing army of autoists, makers of apparel have accomplished some wonderful achievements in the way of appropriate and fashionable toggery. There was a time, and not so very long ago, that automobile clothes were considered a luxury, but now all this is changed, and as stunning an outfit as one might wish can be owned at small cost. For example, a fashionably cut coat of imported worsted, rendered rainproof by a chemical process, is now being sold for \$20 instead of \$33, as was the case two years ago. Makers of automobile clothes have succeeded in providing more desirable garments than ever before for the discriminating feminine automobilist, and with models fashioned from the latest ideas of the best European designers to aid them, American dealers

are enabled to offer equally as smart fashions as one sees on the Continent and at wonderfully attractive prices. The accompanying illustrations will give an idea of what the best toggery shops are selling. When touring for long or short distances one is obliged to consider the question largely from the standpoint of comfort, but when driving through the park there is no possible excuse for one to appear dowdy. There are so many fascinating coats and hats that nearly every type can be suitably fitted if only a little discrimination be em-

ployed in the selections. To appear fetching in auto garb is largely a matter of millinery. Given a becoming hat and veil, a woman cannot help attracting favorable comment. Modish women automobilists are fond of the little French hats with peaked fronts or soft brims that may be adjusted to suit the individual. Some of these have pongee or crêpe de chine curtains with long ties, while others equally as smart are held in place by big square veils arranged in any desired fashion. These veils measure two yards each way and are found in a large range of attractive combinations. A stunning veil of this type is deep cream color with cardinal polka dots and two-inch border. Another in white decorated with empire green is shown among the stylish effects. A five-yard-long veil has a white silk mesh center with brown chiffon ends; the white part is intended to cover the face and the ends arranged over the hat and hair ending in a big bow at the throat.

A charming example of how to make a picture of oneself in an automobile was exhibited by a well-known society matron a few days ago when she motored into town for a glimpse at the new spring bonnets. She wore a Scandinavian leather costume in that lovely new shade of red called dahlia; it is that soft, pinkish red obtained by uniting crimson and cerise. The skirt was made with a fitted yoke that ended below the hips in rather small scallops. The lower part was cut with many gores that flared considerably from the yoke to the hem. A trig little Norfolk jacket trimmed with stitched straps and further ornamented with flat gilt buttons reached the lower edge of the skirt yoke. A stunning hat with stitched suède brim and shirred silk crown was decorated with two long wings that inclined backwards. The effect produced was one of rare taste and discernment in costume design. A cream



WHITE MOHAIR, LEATHER TRIMMED.
Courtesy of the Auto Supply Company.

colored crêpe de chine veil with tucked ends protected the face and crossed at the back, where they were tied in a fetching bow that floated in the breezes a distance of a foot or more. White cham- ois gauntlets added the desired chic to the outfit. For general hard use there is nothing like a motor coat of some serviceable cloth made with ample fullness and easy of access. Leather trims a number of the smart- est models when it is applied in the form of strappings or merely as collar and cuffs. An attractive loose coat of rainproofed cloth in gray, with



THE GIBSON COAT IN LEATHER.
Courtesy Scandinavian Fur & Leather Co.



SILK RUBBER RAIN COAT.

Courtesy of Auto Supply Company.

light blue cross bars is trimmed with rain-spot proofed velvet. The yoke is distinctly new and practical, being fastened, as it is, on the shoulder instead of the front, where the wind has full play. The shape of this new yoke-cape, as it is best described, is particularly becoming and offers just enough of a dressy touch to make the coat suitable for all-round wear. Fancy metal buttons decorate the cape and close

worn by automobilists. An elegant silk coat in golden brown seen this week was loose fitting at back and front and had big fluted revers that fell back, revealing a sumptuous waistcoat of lemon colored leather fastened with gold buttons. The sleeves were big and long and were completed with satin wind-cuffs concealed inside the lower edges. Pongee in natural and all fashionable shades is shown extensively in the realm of smart materials for semi-dressy clothes. There is hardly anything that quite comes up to the dustproof qualities of pongee and in the best imported stock a frock or coat will look well an entire season. When the automobile spin is to end at a fashionable restaurant or theater the pongee costume with top coat to match is smart. Some of the imported pongee motor dresses are charming enough for street wear, many of them being designed by the world's best dressmakers and displaying endless amounts of exquisite hand work.

Going back to the waistcoat question, there are some elegant ones in leather, made both with and without sleeves. The double-breasted style is generally preferred and the fondness that some women have for costly buttons falls short of downright extravagance. Sometimes the waistcoat buttons will be studded with jewels to match the color of the leather; then again they will be gold filigree or etching. Antique silver buttons with big square buckles in corresponding design are shown among the recent importations, and if the craze continues we soon shall see automobile jewelry in general use.

Apropos of motor accessories, certain clever milliners are providing skillfully shaped hats, with adjustable brims, that can be turned over the back of the head, completely covering the hair. The illustration represents one of the smartest of this class in Copenhagen blue straw, trimmed with a band of velvet and two rosettes. This quaint little model may be worn in half a dozen different ways and each one equally becoming. Sensible little caps of tweed or pongee, with visors fore and aft and flaps which may be worn over the ears or fast-



A COMFORTABLE TOURING COAT.

Courtesy Scandinavian Fur & Leather Co.

the fronts with a long tab. A full crown cap, with deep visor made of the same cloth, accompanies this very desirable garment and gives a very fetching effect to the whole gown as an ensemble.

Quite out of the ordinary but very elegant is a long semi-fitted coat of white mohair, trimmed with bands of black patent leather. A helmet with full plaited crown and cunning little mushroom brim is simply finished with a band of patent leather. The style is particularly well adapted for any style veil or hood and while one might imagine from the description that the shape would be trying, on the contrary it is generally becoming. Another fascinating coat for rain, wind or dust is of rubberized plaid silk in the loveliest of rich colorings. The pointed yoke is finished with pipings and the full sweep of the garment gives it a wonderfully attractive style all its own. Big puffed sleeves, finished with close cuffs, are cut in such a way that they slip over almost any style dress sleeve without disarranging its folds. A pretty little head-covering for rainy weather is in the shape of an evening hood, made to fit snugly and finished with a curtain to shed the water. The peaked top gives just enough of the picturesque to make the style attractive.

One of the newest and most dressy costumes is in elephant gray leather, trimmed with touches of crimson leather. The model is one of the smartest shown this season and is made in the Gibson style, with broad shoulder effect, full bishop sleeves and fitted body held taut by a narrow belt which joins the skirt to the waist. A knee depth circular flounce completes the lower part of the garment. Three exquisite buttons in gun metal filigree over red enamel decorate the front, that closes a trifle to one side. With this stylish costume is shown an odd little flat hat having its oblong brim stitched to give it desired firmness; the quartered crown combines both gray and red leather. Several different effects can be obtained by slight turns and twists of the brim, which makes the model one of the most desirable brought out this season.

In fashionable quarters one sees a host of beautiful empire coats

ened up on the cap, are popular for long runs in the country. Sometimes the goggles will be inserted in the front visor, in which instance the visor is adjustable and can be turned up like the ear flaps. A practical gauntlet has slats in the cuff that preserve its shape and render it possible to fold in extremely small package. These in dogskin are among the novelties lately unboxed by one of the well-known dealers.



COSTUME OF DANISH LEATHER.

Courtesy Scandinavian Fur & Leather Co.

In and About the Crescent City

By Felix J. Koch



PURE COUNTRY MILK.

HE was from the North, obviously; had had his auto shipped to the Crescent City, where it would be transferred for the trains going West.

The time hung idle in New Orleans, just a sort of holiday, between trains. Why not put it to advantage? So he resolved to hunt out queer corners of the Crescent City en automobile.

Whither and whence! He would let fancy dictate. A "Coliseum" car came along and he followed behind. It was Springy, and warm, here, this April day, but folk were wearing overcoats, and he, from the North, wondered why. He could see an old darkey "mammy" leading "massa's" children to church, and it recalled the South he had read of. He noticed the absence of barber-poles; that, down here, instead, shops had the entire front painted in red and white stripes.

He circled about the Lee Monument, toward the pretty places with their balconies out over the walk, to pillars along the curb, and it recalled the Norman cities he had autoed to. One old place had a wistaria growing over its several porticos. He stopped to maneuver past some boys playing ball here in the street, turning down a square of massive palms to a boulevard, that captivated him fairly. In the center of the street was the asphalt walk. Then a strip of lawn with the shade trees. After this, on either side the car tracks, and then the street itself, with the walks overhung with trees, now bearing their wealth of new spring leaves. There were men everywhere, working on these streets, and this despite the Sabbath. Many of the shops, too, were open, and the bootblacks were very busy. By and by he skirted a park, rather pretty, though but a square in width, and given over almost wholly to China trees—umbrella-shape ever and always. Children were skating here on the walks, as they did in his home city.

Some of the Odd Characteristics of New Orleans.

Then he came to the "Coliseum"—a music hall he took it to be, but just the sort of old three-story Southern place he had wanted to "bag" with his kodak. Other, even prettier places, with fluted pillars to their porticos were here, and there were tennis courts in the gardens. He carried a note book, as all careful autoists should. He recorded the number of winter cars that went by, though this was to him warm spring weather. He recorded the signs everywhere about town, warning strange girls to beware of strangers, or against entering positions whereof they do not know the mistress, and it reminded him of San Francisco. Fig trees, such as he had seen in Paris gardens, were in the yards here, and their quaint Frenchy trellises, with iron spears, it seemed, set against iron uprights. Set among these fine old places was Tulane College, with its ancient piles rising amid the trees. Roofs of the houses were built projecting out against the sun everywhere in this section. Little lads with kites played on the way or in the "neutral ground," as the lawn in the street center was called.

Here and there he noticed queer pedestrians: Men with odd wicker bread baskets on their backs, such as he'd seen in Bulgaria. Again he stopped for a snapshot of the stock-brick Southern University, an old three-story edifice, with its center-front indented behind four pillars and its campus starred with trees.

A typical Southern home, such as he'd imagined Sinclair's of "Uncle Tom's Cabin" to be, was here—this and a great asylum, and then the car barns. He felt he'd about reached the outskirts by this time, though there were more gardens with the folks sitting out in them, so he turned and looked for guides.

Following the car line didn't seem such a bad plan after all. Another car, marked "Henry Clay Avenue," came along, and in pursuit of it he went. Aside, however, from an occasional old negro, a quaint typical Southern type, and the "ads" of a certain "Aunt Hannah's Death Drops," and a queer southern church completely covered with ivy, except at its long, plain windows, this "up-town" section did not afford him much. In fact, small places, with awnings along the street, seemed to comprise most of the way.

By and by he was back at his caravansary. The sun, however, shone so bright it seemed no day for indoors in hotels. And what was more, he would test the cafés of New Orleans. He followed the crowds toward Fairbacher's, one of the old-timers, beyond all advertisement. There he partook of calf's-head *a la Creole*, cooked with mangoes and okra and tomatoes. Then chicken livers and beer. He noted the restaurant and its compactness. Down one side a brass rail extended, and beyond this there was a marble lunch counter, with shelves of white marble behind it, and on the top of this the pies. Mirrors with the prices painted here and there on their faces and tapestries representing varied viands completed the picture, save for the little white-clothed tables, seating four apiece, at 'tother side the rail. The food was excellent and well served.

How the City Looked in the Afternoon.

After the meal he stopped a moment, as he paid at the door, to watch perhaps fifty of the city street cleaning carts, in line, going out for the day's work. Seated on each was a negro, wearing a bright red shirt for uniform and marking the procession from afar.

Again he took the car for guide, this time toward "Bayou St. John." It led him through the negro section, a section much like that of a Turkish town, even to the dumping of slops out in the street, and made him wonder that yellow fever was not more prevalent than it is. Women, carrying their babies here, had a great veil tied from their arms, across the child to the mother's shoulder, so as almost completely to inclose the infant.

Then he came out at the bayou with its skiffs and other boats. Incidentally, he could do some sightseeing. But a few blocks away was the famous City Park track, where the races were then on. It was a good place to "rest" the auto, and, for a time, he nosed about. Took snapshots of Lady Katherine, a descendant of Roselyn III, the famous two-year-old of the Colonel, and Sweet Sunshine and other steeds. Then, of the racing men scattered promiscuously about, among the fifty cent and dollar seats everywhere.

The center of the park was one great lawn, about which a white-painted fence stretched, and then, encircling this, a broad gravelly track. This in its turn was encircled on one side by the long, one-story horse sheds, such as he had seen at the home city, and among which a man was just then peddling bananas. Over on the other side the large two-story stable of Colonel Nemo, famous as a turfman, arose, these and those of another race man, built in the southern style. There was the large, modern grandstand, and before this, at the track, the starter's cupola. Opposite this, the signboard with the time of the different horses coming in, the clock and the bell. In distance, he could see the mile-posts marking out the course.

Somchow or other, however, city autoing was paling by this time. He turned cityward with just a trifle of a surfeit. Going out he had passed a theater, where the poorer class seemed to go. It might give him a peep at New Orleans's underworld, so

he left the auto in garage. As it proved, the theater was the Lyric and the play nothing worse than "David Copperfield."

Here was still time for a parting glance at New Orleans. From the St. Charles he sent his *chauffeur* down to the train with the valises, and then betook himself to the stores for souvenirs of his stay. Little bales of cotton, with darkeys bearing rice strands atop, were the most typical things he could find.

Again the call of the French restaurants lured him. He stepped into one, where the orchestra was playing the "Blue Danube," and following this up, then, with "Give My Regards to Broadway."

It was supper time in New Orleans, and he was curious to see what they ate. Six fried oysters, of which the people are inordinately fond, buying at thirty cents the half-dozen, chicken salad, beer and a charlotte russe seemed a favorite combination. He admired the young women with their sleeves cut at the elbow; he admired the gallant young men. By and by the clock showed him that it was time he were stirring. The auto by this time would be aboard the car.

Wearily he retreated to the hotel for his parcels, and the great postal album he would carry. Then, equally weary and somewhat stiff, he loitered down to the train.

The berth in the sleeper looked decidedly good.

GERMAN NOTES.

BERLIN, April 9.—Entries will soon close for the Herkomer, and they promise to outstrip all expectations. Great preparations are being made everywhere to make this third contest a record one, but till now it has not been possible to go entirely over the course owing to the snow in the mountains. The Dresden - Chemnitz - Zwickau route, originally the bugbear of the committee owing to its water-cuts, is now in very good order.

A company has been formed at Munich to open up a line of motor coaches in the neighborhood of the Bavarian capital, penetrating for the present as far as Kochel in the Bavarian Alps, with further extensions later on. Four different tours have been fixed for the present, and the fares are moderate.



TULANE UNIVERSITY, NEW ORLEANS.



OLD FRENCH QUARTER OF THE CRESCENT CITY.



OUT THE BOULEVARD TO THE CITY CEMETERY.



A TYPICAL SOUTHERN HOMESTEAD.

NEWS IN NEW ORLEANS.

NEW ORLEANS, April 20.—Owing to the fact that the roads in and about New Orleans are not in a condition suitable for automobiles, time and endurance races in this section are not common. The only road leading out of New Orleans is one that follows the course of the river for some distance. In good weather the cars can run at full speed safely, but after a series of rains, passage over them is very difficult. It is believed, however, that there is an old military road

leading out from Covington, La., to Memphis, Tenn., which, if it is true, will afford the autoists a new field for their operations. Palmer Abbott has recently ordered a large shipment of cars to New Orleans, one of which will be shipped to Covington, as there is no direct road between there and New Orleans. He will then go to Covington to investigate the road for himself. If it is found desirable it is thought that several races will be arranged for in the near future, as there are a large number of enthusiasts in the city who long for excitement beyond the asphalt.

The Louisiana Automobile Association has not been doing much of late, and interest in that particular direction seems to have somewhat dissipated itself, despite the fact that the sale of cars in this city continues to be rather large.

The only tour of any particular note which has taken place lately occurred about a month ago, when Earl Knobloch made the trip from New Orleans to Thibodaux and back, a distance of 250 miles, in fourteen hours. Mr. Knobloch says that that is about record time for the trip, and shows an average

of about 18 miles per hour. He made the trip in a 1907 Oldsmobile, leaving New Orleans Friday at midnight, and arrived at Thibodaux, having passed through Donaldsonville early Saturday morning, and having made only one stop, for his breakfast. At 2 P. M. the party started home, arriving here at 9.30 Saturday night. The tool kit was not touched throughout the trip. The roads on this particular trip were good, which cannot always be said of them, though of late years they have been improved.

SPRINGTIME'S ADVANCE STIRS CLUBS TO ACTION

Canada Has an Active Club at Winnipeg.

WINNIPEG, CAN., April 22.—The annual meeting of the Winnipeg Automobile Club took place April 17, when the following officers were elected: Patron, Sir Daniel McMillan, Lieut. Governor of Manitoba; honorary president, J. C. G. Armytage; president, Judge Phippen; first vice-president, R. M. MacLeod; second vice-president, T. M. Belcher; secretary-treasurer, W. C. Power. Forty-seven new members were elected, bringing the total membership of the club to over 100, and a further election of some thirty members will be balloted for at a special meeting to be held at an early date.

It was decided to promote a reliability contest extending over a period of not less than three days, the choosing of the routes to be left to the touring and racing committee for selection. The entries will be divided into two classes, the first for touring cars and the second for runabouts. Handsome trophies will be provided for competition.

A special legislative committee was also appointed to watch the interests of automobilists in regard to any measures that the authorities may bring forward for the control of automobiles in Manitoba, and a special member's card will be provided, signed by the president and the chief of police in order that the members can be saved the necessity of proceeding to the police station under arrest in case of trouble, the card being accepted as a guarantee for appearance when summoned to attend.

The retiring secretary, A. Emmett, who has held the position for the last three years, was presented with a purse in recognition of his services to the club.

The good roads movement organized last year is receiving the support of every user of a vehicle of any description, and great efforts are being made to boost the movement to a successful issue. Government support is being sought for road improvements and a special grant will be asked for at the next session of the provincial legislature.

Motorcycling at Harvard is Popular.

CAMBRIDGE, MASS., April 22.—Motorcycling is having quite a boom at Harvard University. The motorcycle club organized there two years ago has taken a new lease of life, and will begin work in earnest this spring. The club was founded in 1905 by L. E. French, H. G. Hawes and W. M. Davis 2d., and held a successful hill climb that year on Commonwealth avenue, Brighton. The attempt at organization proved rather premature, however, and only recently has much interest been aroused. Now there are about twenty machines in use in the university, and it is believed that the owners of all of these will join.

The club has made arrangements with the Harvard Automobile Company for the storage and care of members' machines at reduced rates in the new garage on Quincy square. Weekly runs will also be held as soon as the roads are in suitable condition, and another hill climb is in prospect. Nothing definite has been decided about this, but the date will probably be April 30.

Sons of Eli Form the Yale Automobile Club.

NEW HAVEN, CONN., April 22.—A meeting of all the men in college interested in forming the Yale Automobile Club was held last evening at the University Club in this city. After a general discussion as to organization, the following officers were elected: President, George H. Townsend, '08; secretary, W. Morden, '08; treasurer, E. H. Butler, '07. A committee of four was appointed by the president to arrange a series of meets and hill-climbing contests. Thirty members have already shown their intention of joining the club.

Washington Club Objects to Young Drivers.

WASHINGTON, D. C., April 22.—The Automobile Club of Washington is favoring the adoption of a proposed amendment to the automobile regulations prohibiting the operation of automobiles by all persons below the age of eighteen years. Such a regulation has been drawn by the corporation counsel and it will probably be put into effect within the next thirty days. The proposed regulation was framed at the suggestion of the District Attorney, who stated that the grand jury now sitting had called his attention to the number of accidents resulting from the operation of automobiles by boys.

It will be remembered that the automobile board of the District of Columbia has frequently recommended the adoption of the 18-year age limit, on the ground that persons under that age are physically unable to operate automobiles. As far back as 1903 the matter was referred to the then corporation counsel, who stated that while it was within the power of the District commissioners to promulgate such a regulation, he did not deem it expedient to adopt an iron-clad rule, as to refuse to permit everyone under 18 years of age to operate a car would manifestly prevent the use of automobiles by persons who are fully as competent as persons much older.

On the other hand, Secretary Woodward, of the automobile board, does not believe that any distinction should be made. He states that in his opinion not one boy in a hundred is competent to handle a car at a time when a cool head is required, no matter how skillful a driver he may be.

Yorkians of Pennsylvania Re-elect Officers.

YORK, PA., April 22.—A pleasure run was arranged and officers for the ensuing year elected at the annual meeting of the York County Automobile Association. The pleasure run will be from this city to Hanover and return, Sunday, May 5. The local autoists were extended the invitation through Thomas J. O'Neill, the second vice-president of the association, who resides in Hanover.

All of the association's officers were re-elected as follows: President, Dr. J. F. Klinedinst; first vice-president, Clarence A. Geesey; second vice-president, T. J. O'Neill, of Hanover; treasurer, Gordon Nes; secretary, Stuart B. Lafean. During the meeting the coming endurance run of the Harrisburg Automobile Club was referred to, and it is the general opinion here that many Yorkers will contest for the cups. The first night's stop in the endurance run will be made in this city.

President Duttenhofer Re-elected by Cincinnatians.

CINCINNATI, April 22.—At the annual meeting of the Automobile Club of Cincinnati, the following board of governors and executive officers were elected for the ensuing year: President, Val Duttenhofer; first vice-president, Dr. A. B. Hyl; second vice-president, F. N. Temple; secretary, Dr. L. S. Colter; treasurer, C. Gordon Neff; consulting engineer, E. J. Carpenter; governors, the above and Dr. McKim Cooke, Gustav W. Drach, Dr. C. L. Bonifield, W. B. Gotherman, Harry L. Mauss.

The annual report of the secretary showed a membership of about 200. It was voted to appropriate \$1,000 to be expended by the committee on guide posts in the erection of sign boards at the intersection of all the prominent roads in Hamilton county, and the estimate calls for 150 of these useful indicators. The club also passed a resolution containing a number of suggestions to be forwarded to the local chief of police defining the position of the club on local conditions pertaining to automobiling, the chief of which are as follows: A firm stand against fast driving and exceeding the speed limit, particularly in the city;

advocating that the police arrest drivers with old or no tags, and smart drivers who put their tags on front of cars, instead of rear, as prescribed by the law; to discountenance the use of siren horns for city driving; to discountenance the payment of fines of chauffeurs by owners of cars when owner is not in car; to furnish members with maps of the local roads, and asking members to make reports on special roads.

Controls Selected for the New Jersey Endurance Run.

NEWARK, N. J., April 22.—The special committee of the New Jersey Automobile and Motor Club, headed by Louis T. Wiss, has made a tour over the route selected for the three-day endurance contest scheduled for May 30-June 1, and definitely named the controls which will be utilized during the run. On the first day's run the checking points will be Morristown and German Valley, stop being made at Washington for luncheon. There will be but one control in the afternoon, Somerville being designated as the place, the finishing point for the first day being at Newark. Starting from Newark on the morning of the second day, the contestants will run free to New Brunswick, where the first control will be situated. After New Brunswick will come Trenton and Mt. Holly, where the tourists will stop for luncheon. White Horse Tavern, Egg Harbor City and Atlantic City will be the checking points for the afternoon.

It is not yet entirely certain where the noon control for the last day will be placed, although Freehold is favored by the committee if accommodations can be obtained. Stations previous to Freehold will be Tuckerton and Toms River.

Minneapolis Elect Asa Paine Their President.

MINNEAPOLIS, MINN., April 22.—At the annual meeting of the Minneapolis Automobile Club, Asa Paine, formerly the club's vice-president, and president of the Florida East Coast Automobile Association, was unanimously elected to the presidency. The other officers elected are: First vice-president, Horace Lowry; second vice-president, Benjamin F. Nelson; secretary, R. J. Smith; treasurer, J. H. Riheldaffer.

Retiring President Joyce, in a short speech, congratulated the club on its growth and prosperity. He pointed out that within a year the membership of the club has been increased by 227 members, making a total of 500.

The report of the treasurer showed that the finances of the club are in sound condition and that the clubrooms have been a source of profit rather than of expense. Following the discussion of this subject the club turned to the interesting topic of good roads, and might be talking about them yet had not the call to back rooms, where a buffet lunch was ready, interrupted. The members resisted just long enough to authorize the appointment of a committee of five to confer with Mayor J. C. Haynes relative to the enforcement of the ordinance against throwing bottles, glass and rubbish into the streets.

CLUB DOINGS IN GENERAL.

Brooklyn, N. Y.—The Runs and Tours Committee of the Long Island Automobile Club, following the custom of previous years, has chosen the first Saturday in May for its annual spring run. The club's May run has always brought out a representative number of cars, and this is expected to surpass all others.

Philadelphia.—The elegantly appointed quarters of the Ladies' Quaker City Motor Club in the Hotel Majestic were opened on Monday night, the April meeting being held there. Early in May a "housewarming" will be held, on which occasion the male friends of the members will be invited.

Montclair, N. J.—It is expected the first meeting of the Montclair Automobile and Driving Club will be held next week. The plans of the organizers are to have the first meeting take place at the new Hotel Montclair, which is expected to open on May 1. Over 125 autoists are expected to join.

THE AUTOMOBILE CALENDAR. AMERICAN.

Shows and Meetings.

- May 28-31.....—Indianapolis, Ind., Annual Meeting American Society of Mechanical Engineers.
Oct. 31-Nov. 7...—New York City, Madison Square Garden, Eighth Annual Automobile Show, Association of Licensed Automobile Manufacturers.
Nov. 30-Dec. 7...—Chicago, Coliseum and First Regt. Armory, Eighth Annual National Automobile Show, National Association of Automobile Manufacturers.

Races, Hill-Climbs, etc.

- May 6-7.....—Harrisburg, Pa., Two-day Endurance Run, Motor Club of Harrisburg.
May 30.....—Philadelphia, Hill Climb, Monk's Hill, Quaker City Motor Club.
May 30.....—Chicago, Memorial Day Race Meet of the Chicago Motor Club.
May 30.....—Bridgeport, Conn., Hill Climb, Bridgeport Automobile Club.
May 30-June 1...—Newark, N. J., Three-day Endurance Run of the New Jersey Automobile and Motor Club.
June 12.....—National Orphans' Day, instituted by the American Automobile Association.
June 20.....—Albany, N. Y., Annual Tour of the Albany Automobile Club, Route, via New York and Asbury Park, to Atlantic City.
July 10.....—Cleveland, O., Start of Fourth Annual Tour of the American Automobile Association, for the Glidden Trophy. Finishes in New York City on or about July 23.
Oct. 19.....—St. Louis, Mo., International Aerial Race of the Gordon Bennett Prize. Aero Club of America.

FOREIGN.

Shows.

- May 4-15.....—Madrid, Spain, Automobile Exhibition, Palace of Fine Arts, Royal Automobile Club of Madrid.
May 15-26.....—Zurich, Third Annual Swiss Automobile Show.
June 25-30.....—St. Petersburg, Russia, Automobile Show.
Nov. 12-Dec. 1...—Paris, Exposition Decennale de l'Automobile, Grand Palais, Esplanade des Invalides, Automobile Club of France.

Races, Hill-Climbs, etc.

- April 28.....—Chateau Thierry Hill Climb.
May 4-14.....—Spring Wheel Competition, A. C. of France.
May 15-31.....—Belgium, Industrial Vehicle Trials, Automobile Club du Nord.
May 18-21.....—Milan, Italy, Touring Club Trials.
May 22-25.....—Irish Automobile Club Reliability Trials.
May 24-27.....—Voiturette Contest, Automobile Club of Austria.
May 28.....—Isle of Man, Tourist Trophy Race, Automobile Club of Great Britain and Ireland.
May 30.....—Isle of Man, Heavy Touring Car Race, Automobile Club of Great Britain and Ireland.
June 3-12.....—Paris, Electric Vehicle Competition, Automobile Club of France.
June 3-12.....—Herkomer Cup, Automobile Club of Bavaria.
June 14.....—German Emperor's Cup, Taunus Circuit, Imperial Automobile Club.
June 20-22.....—American Gold Cup, Start from New York of European Tour for American Cars, Georges Dupuy, secretary, 1402 Broadway, New York City.
June 14-29.....—Scottish Reliability Trial, Scottish Automobile Club.
July 2.....—Grand Prix, Automobile Club of France.
July 14, 1908....—Paris to London, Aerial Race.
July 15-18.....—Ostend Week, Record Trials, Automobile Club of Belgium.
July 21.....—Ardennes Circuit (Belgium).
July 31.....—Lledekerke Cup for Touring Cars, Ardennes Circuit, Belgium.
July 31-Aug. 8...—Belgium Regularity Contest for Touring Cars, A. C. of Belgium.
August 1-7.....—Criterium of France, 1,750 Miles Touring Competition and 250-mile Race for the Press Cup, A. C. of France.
August 11-29....—France, Coupe de Auvergne.
Sept. 1.....—Italy, Brescia Circuit, Florio Cup, A. C. of Italy.

SIX CARS READY FOR PEKIN-PARIS.

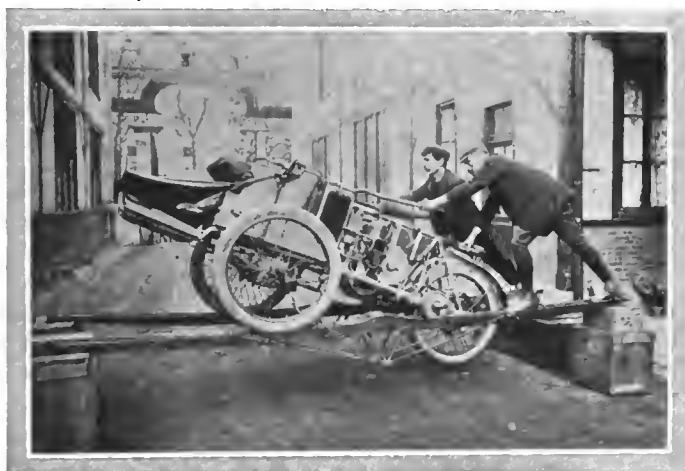
PARIS, April 15.—Pekin-Paris on auto is now a certainty. The Chinese Minister of Foreign Affairs at Paris, having communicated the fact that the contest is authorized by his government, June 10 has been fixed as the date of departure from the Far East. Certain starters are Fiat, Itala, De Dion Bouton with two cars, Contal with a tri-car, and Spiker a 40-horsepower Dutch machine. An illustration is given herewith of the Contal tri-car to be driven by Pons, fully equipped for its long trans-Siberian journey. The power plant is of the standard type, but the machine has been specially equipped and fitted to carry the spare parts and special tools which may be needed for a journey over a country which has never known other modes of locomotion than the camel caravan. Pons is shown crossing an imaginary ditch by means of the portable bridge which he carries with him on metal brackets at each side of the car. He has a complete camping outfit, for frequently the automobilists will have to pitch their tent in the open air, far from dwellings, spare tires, and extra provision for gasoline. The Spyker has an open touring car body, the entire tonneau of which is fitted up with spare parts, jacks, tools, camping outfit and the thousand and one necessaries for such an adventuresome trip. The whole is



EN AUTO TO THE FINAL RESTING PLACE.

Automobile electric hearses have been introduced in Berlin by the company which first placed the taximeter cab in service in that city.

Small bars of lead are very useful in adjusting the finer parts of a machine. The bars can be readily held on the strap, or key, or bolt head, and a straight and effective blow can be struck by the ordinary hand hammer. In any event, the copper hammer, so-called, should be abolished or reformed altogether. The element of durability is its worst feature. It hardens as it grows older. Its blows mar the finest features. Like the leprosy or the smallpox, its victims are known at a glance.



FRENCH TRI-CAR EQUIPPED FOR PARIS-PEKIN RUN.

covered over with a tarpaulin mounted on a light frame. Pons, the Contal driver, left Paris this week by road for Marseilles, where he will embark on the Oceanien for the East. Cormier, the De Dion conductor, left here a week ago by train for Pekin to make arrangements for establishing gasoline and tire stations on the route. His machine will leave from Marseilles together with that of Pons. Although the German consul at Shanghai states that the majority of automobiles in that city are of American and British manufacture, these two nations are not represented in the tour.

ABUSE WITH THE HARD "SOFT" HAMMER.

Thirty or forty years ago there were hammers made of babbitt that were really soft and left no mark. Now they are made of scrap copper or dross of bronze or other indescribable compounds, says the *Mechanical World*. Knuckles and corrugations gather on their wrinkled faces, and their impressions can be seen and felt all around the twentieth century locomotives. The mechanic who has ever finished a strap knows that there is a silken softness about a finely finished strap or other highly polished unhardened metal. He begins operations with a block of wood. The soft hammer breaks the wooden block into a thousand pieces, and there is no time to keep up the supply of timber, so in the general hurry and confusion incident to getting the engine out the alleged soft hammer begins to get its work in. Hammers of lead or babbitt are comparatively harmless, and easily made.

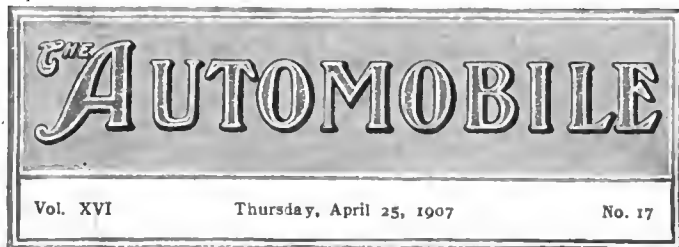
SOME JOYS OF CAMPING A LA AUTOMOBILE.

As a means of recreation during the dog days of summer, it must be admitted that there are few things to equal camping, but when, to add to its pleasures and rob it of some of its inconveniences, the automobile is thrown in, it is indeed a pastime for kings. Not a few venturesome autoists in appreciation of this have fitted their cars up in various ways, some of them with most wondrously contrived kits, others utilizing the car both as a conveyance and as a sleeping room. The accompanying photograph pictures somewhat of a variation on any of the foregoing, for it may well be termed a typical automobile camp, in that a canvas garage has been provided for the car, in addition to the "grub" and sleeping tents.

The car is a Thomas Flyer and is the property of Hon. S. R. Dresser, Bradford, Pa., who is an advocate of the open-air life. For the ingenious method shown of sheltering the car against the weather while in camp, his chauffeur, F. C. Rupp, is responsible, and it is one that may be followed to advantage.



MODEL CAMP OF THE HON. S. R. DRESSER, BRADFORD, PA.



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Tire Limitations Be- Nothing has better demonstrated
coming; Better Recognized—the force of the saying that the
 more a man knows about a thing the less disposed to complain
 he becomes, than the past year or two of tire history. True,
 there are still those who damn the pneumatic tire unceasingly
 and try something else, only to come back to it in the end; they
 are the ones who have yet to learn. Once they have matriculated
 and joined the ranks of the seasoned autoists, they no longer
 waste time in vilifying pneumatic tires in general and the one
 brand of their personal experience in particular—simply because
 they know. No one is in a better position to realize that, despite
 all its shortcomings, there is nothing to replace the pneumatic
 tire than the autoist who has been induced to join in the hunt for
 this will o' the wisp by unfortunate early experiences. The
 majority learn without going through the mill of substitutes.

The autoist who knows realizes that there are worse things
 than punctures, and does not sacrifice his all to gain this one end.
 There can be no gainsaying the fact that tire maintenance is still
 the most substantial item in keeping a car, but experience has
 shown that, with other forms, speed and comfort are sacrificed
 to a very questionable gain in outlay; it would perhaps be truer
 to add that the expense has not been decreased materially—
 simply transferred to another account. Commendable efforts are
 being made to discover a working substitute for the pneumatic
 tire, and the number of devices already brought forth is legion.
 Many are ingenious, others promise well, but none is quite the
 equal of the rubber-confined compressed-air cushion. Like gold,
 rubber comes high, and near-rubber in a tire is just about as
 valuable as near-gold in jewelry; there are numerous things

which have many of its attributes, but they all lack the one most
 important—they are not rubber. Experience has shown that,
 given the proper sizes to begin with, a little care and reasonable
 use means value received from the pneumatic tire in every
 instance, and this is what the average autoist has come to realize.



Consideration for Other Users of the Highway

"To sum up the whole situation, the motorist on the road can ill afford, for the sake of the sport, to make a single bad friend by any act of omission or commission," says Charles J. Swain, president of the Quaker City Motor Club, in the course of an article entitled "Courtesy on the Highway." Unfortunately, there are far too many autoists who consider the vastly greater power and speed at their command than is granted to other users of the highway to control, as sufficient license in itself for ignoring any rights those others may possess. The autoist who is also a horseman, and who has occasion to use the country roads himself when drawn by the faithful Dobbin, is in a position to realize the helplessness of the man behind the horse, as well as the feeling of impotent rage which sweeps over him when he sees his rights thus deliberately trampled upon. To be commanded peremptorily to clear the road by a car yet half a mile away, with its long-drawn wail, is certainly bad enough.

But it does not compare for an instant with the wholly inconsiderate habit the same type of user has of rushing around corners on narrow country roads without giving a thought of what may lay beyond. Mr. Swain remarks, in the course of the article referred to: "I would lay special stress upon consideration for the farmer. The harboring in his mind of an injury, real or fancied, cannot but incur his enmity." Surely this habit of attempting to usurp the entire highway, both on straight stretches and turns, is not a fancied wrong; it is the prolific cause of accident and always of hard feeling. Only through consideration for other users of the road, which is regrettably absent in the actions of a number of autoists, can the advocate of the power vehicle, who uses the road for his pleasure, and the country resident, to whom it is an absolute necessity, meet on a common ground.



Increasing Use of Anti-Friction Bearings.

In few essentials of the car is the general trend toward improvement more noticeable than in the constantly increasing use of anti-friction bearings of different types. As it first came forth, particularly in this country, the automobile was a piece of mechanism that depended upon the regulation type of plain bearings for practically all of its moving parts. The lessons taught by the bicycle were shortly taken advantage of, so that almost from the beginning at least the road wheels have run on an anti-friction bearing, patterned at first after bicycle practice. It required an equally short time to demonstrate that both the plain bearing and the old ball bearing were unsuited to the new duties.

Next to the wheels, the part of the car that showed itself to be most in need of an improved type of bearing was the change-speed gear box, and there is little doubt that experience in the use of ball bearings on this essential has done much to further their adoption on other parts of the car. The same is true of the roller bearing, of which two or three types are in current use both on wheels and in change-speed gear boxes as well as for bevel-gear drives and rear axles. In short, the car that does not employ some sort of anti-friction bearing, at least for the sliding gear set, is an exception that would be difficult to locate. From this it has been but a step to the introduction of such bearings in the motor itself, and though the number thus equipped is still considerably in the minority, the fact that their use for that purpose is on the increase is evident. It is scarcely necessary to enumerate their advantages over the plain type in any capacity on the car; the chief drawback would appear to be that of initial cost, but the greater durability and freedom from trouble accompanying their use are rapidly overcoming that objection.

MICHIGAN'S A. A. A. STATE ASSOCIATION.

DETROIT, MICH., April 22.—As expected, there was little difficulty in forming the Michigan Automobile Association of the A. A. A. Representatives of the Grand Rapids, Saginaw, and Detroit clubs met in Detroit last week and perfected an organization in a few hours. These officers were chosen: President, Edwin S. George, Detroit; vice-president, Dexter M. Ferry, Detroit; secretary, Dr. D. Emmett Welsh, Grand Rapids, and treasurer, J. R. Jackson, Grand Rapids. Paul H. Deming, a member of the national touring board and of the Detroit Automobile Club, was named as a director.

The Detroit, Grand Rapids and Saginaw clubs are the charter members of the new organization, but assurances have been received from Kalamazoo, Muskegon, Battle Creek, and Jackson that automobilists in those cities are taking steps to organize clubs which will join the State body.

D. M. Ferry, Jr., was made chairman of the State legislative committee and J. R. Jackson, of the membership committee.

The forming of the association will mean considerable to automobilists of the State. It will insure for one thing that there will be annual runs between Grand Rapids and Detroit. Grand Rapids will offer prizes at this end of the line for the Detroit enthusiasts to compete for, and the Detroit club will offer prizes for local autoists to contest for. Annual State tours will also be held.

IMPORTERS TO FORM ORGANIZATION.

Initiatory steps for the formation of the Automobile Importers' Society were taken at a meeting held Tuesday afternoon, April 23, at the clubhouse of the Automobile Club of America, New York City. The meeting was held in conjunction with the show committee and officers of the Automobile Club of America, and the show situation was discussed, after which the importers held a session of their own. In attendance were A. Massenat (Panhard), Sidney Breese (Westinghouse), Paul Lacroix (Renault), Percy Owen (Bianchi), G. R. Rheims (C. G. V.), A. C. Newbauer (Delaunay-Belleville), W. H. Bernard (Delahaye and Pilain), Arthur Waterman (Gobron-Brillie), A. M. Thackara (Westinghouse). Letters in favor of the movement were also received from Robert Fulton, of the Mercedes Import Company, and H. C. Cryder, of Cryder & Co. The Automobile Club was represented by President Colgate Hoyt, Secretary S. M. Butler, and the show committee, consisting of Col. George Moore Smith, chairman, Alan R. Hawley, Winthrop E. Scarritt and Geo. F. Chamberlain.

A call was issued inviting all independent automobile importers to another meeting to be held at the same place, Friday afternoon, April 26, when it is expected to permanently organize.

ITALIANS VICTORIOUS IN TARGA FLORIO.

Fiat was victorious in the opening round of the great European racing tournament, when Nazzaro captured the Targa Florio last Sunday on a wild mountainous circuit in Sicily, and Lancia, the eternal second, lived up to his reputation. The race was three times round the most difficult circuit in Europe, the number of sharp turns on each round being about one thousand, total distance being 279.6 miles. Of the fifty-four cars entered for the event, forty-five were sent away at intervals of one minute, Pilain, taking the lead followed by Benz and Darracq. Four European nations were represented by twenty important firms, the drivers including such well-known figures as Lancia, Wagner, Duray, Gabriel, Nazzaro and Hanriot. Albert Clément, who was engaged to pilot a Bayard-Clément machine, was unable to compete owing to the French military authorities refusing to give him leave of absence. After a keenly contested race, rendered still more exciting by the heavy rain which had made the mountain roads slippery, Nazzaro secured first position in 8:17. Lancia, also on a Fiat, finished eight minutes later, and Fabry on an Itala was third. Last year the Targa Florio was won by Cagno on an Itala.

NEW ENGLAND SECTION BLUE BOOK READY.

The New England section of The Automobile Official A. A. A. 1907 Blue Book has just been published. It is a handsome volume of 534 pages covering the best and most popular touring routes in the New England States with a completeness and exactness previously unattained. For 1907 the Blue Book is divided into three convenient-sized volumes, together giving an increase of about 50 per cent. over the single volume of last year. Sections 1 and 3, now in progress of preparation, will deal respectively with New York State and the West, and with New Jersey, Pennsylvania, the South and the West.

The New England book is prefaced by a special section giving the Metropolitan district, Shore Line, and Hudson River connections into New England, the return and connecting routes being covered by the complete sections in the same volume. Altogether, 17,000 miles of road are described and covered almost entirely by marginal maps. Among the entirely new features are general maps covering the entire country in miniature, the special purpose of which is to show the relation of one route to another—in other words to show at a glance how the different marginal maps in the body of the book meet and connect with the route system of the volume as a whole.

For the first time an index of principal trunk lines has been provided, outlining the through routes along the principal courses of road travel in New England. The index of places has been materially enlarged and made more definite and useful. A chart of automobile laws in condensed form occupies three pages of the book, giving the requisite information on registration, fees, numbers, lamps and speed laws for the New England and Middle States. Other tables give the essential facts of the different boat lines, their landings, time of departure from principal ports, and freight rates for the Hudson River steamboats, the steamships on the New England coast, as well as those connecting New York with the Atlantic ports and the West Indies. There is valuable information on European custom duties, freights, regulations, and laws in all the European countries generally visited by American tourists, arranged in the most convenient manner.

Altogether there are 285 routes, covering 17,469 miles of roads, 137 route maps, 19 full-page maps, 71 city maps, and two double-page maps. The volume which is elegantly produced and strongly bound in genuine leather, is listed at \$2.50 prepaid, from the Class Journal Company, publishers of THE AUTOMOBILE, Flatiron Building, New York City.

ANOTHER NEW YORK-BOSTON AEROCAR RUN.

BOSTON, April 23.—An unusual incident marred the New York-Boston non-stop effort of A. E. Robbins with the same air-cooled Aerocar which he successfully drove between the two cities at the time of the Boston show in March. Starting from New York City at 1:15 A.M., excellent time was made until within a few miles of Bridgeport, Conn. At this point the spark throttle failed to do its function, owing to the loosening of a set screw, and the engine came to an exasperating stop. Soon making the repair, Mr. Robbins restarted the engine, which worked beautifully thereafter the balance of the run, which terminated at 5 P.M. at the Boston Aerocar agency. Air-cooled non-stops are infrequent, and to-day's run was noteworthy. Besides the driver, there were George Van Cleve and two observers as passengers.

MEMORIAL DAY RACE MEET AT BOSTON.

BOSTON, April 22.—Boston is to have an automobile race meeting this spring after all. For a time it looked as if the Bay State Association would give up its annual custom of holding a meeting at the Readville track, but after it was announced that the Worcester club would abandon its hill climb, the pressure for some sort of a competitive event became so great that the racing committee of the Bay State Association, at its meeting this week, voted to hold a series of races on Memorial Day at Readville. The committee consists of President L. R. Spere, Charles E. Fay and F. A. Hinchcliffe.

SUBSTITUTES ACTIVE IN AUTOMOBILE OILS.

Success in any business necessarily brings the substitutor and the imitator. Up to this year the substitutor has not been much in evidence in the automobile business, but recently he appears to have become active in the oil trade. Owing to the fact that automobile owners have become better educated in the use of lubricants during the past year, legitimate manufacturers have built up big businesses in particular brands of oil, with the result that imitators have become numerous. Only last week, the Columbia Lubricants Company, of New York, which has suffered considerably at the hands of firms imitating its trade mark, procured an injunction in the United States Circuit Court for the northern district of Ohio, restraining the Atlas Oil Company of Cleveland from the use of the word "Monogram" to designate certain lubricants sold by them. The bill alleges that the plaintiff has built up a large and profitable business on account of the excellent quality of their goods, which would probably have continued to be a source of great profit were it not for the acts of infringement and unfair competition charged to have been committed by the offending firm.

A lubricant known as "Panhard" oil, on the market for several years, has established a good reputation. The oil was named when the Panhard car was first prominent in racing. The fact that the oil was found particularly applicable to the Panhard machine and was used by one of the racing cars of that make led the manufacturer, George A. Haws, to designate it as "Panhard Oil," meaning an oil especially adapted to engines of the Panhard type. As a claim of the quality of the oil the firm designated it as "The oil that will not char." That was in 1904. Recently another oil concern secured a letter from the local agency of the Panhard car, authorizing it to use the name "Panhard," and it is now marketing "Panhard Oil" and it is claimed profiting by the extensive advertising and reputation which the "Panhard Oil" manufactured by George A. Haws has built up.

In Philadelphia, Chas. F. Kellom & Company manufactures a lubricant known as "Invader" oil, and as such it is known all over the country. Recently the firm has heard from various parts of the country that other concerns were selling oil under the name of "Invader Oil." In one case when a salesman for the imitator called on a regular customer of Kellom & Company and was told that they intended to place an order for "Invader" oil he unblushingly stated that his firm made "Invader" oil for Kellom & Company and could fill the order at once.

These are a few samples of what the legitimate concerns in the automobile oil business are subjected to, and owners of cars who have been accustomed to using certain oils will find it to their advantage to be positive that the oil they are buying is the oil they intend it should be.

The following are the names of principal firms making automobile oils and the names of the oils which they market:

Columbia Lubricants Company,	Monogram oils
Fiske Bros. Refining Company,	Lubroleine
Harrington Lubricant Company,	Harrington oils
A. W. Harris Oil Company,	Harris oils
Havemeyer Oil Company,	Havoline oils
George A. Haws,	Panhard oils
Chas. F. Kellom & Company,	Invader oils
Wm. P. Miller's Sons,	Panolite
N. Y. & N. J. Lubricant Company,	Non-Fluid oils
Penn Petroleum Company,	Pennsylvania oils
W. C. Robinson & Company,	Autoline
Orlando W. Young,	Young's oils
Vacuum Oil Company,	Mobiloil
Valvoline Oil Company,	Valvoline

Philadelphia.—A new local organization of motorcyclists—the Pennsylvania Motorcycle Club—was launched in this city last week through the efforts of George W. Morley. Temporary quarters have been secured at 262 North Broad street, and a permanent organization will be perfected during the present week.



STODDARD-DAYTON, FIRST OF THE 1908 SIX-CYLINDERS,

ADVANCE MODEL OF THE STODDARD-DAYTON.

In quite striking contrast with the methods of but a few years back is the present-day manner of taking time by the forelock practiced by the automobile manufacturer. Then it was a struggle to get new models out in time for the January show, and more often than not they were only finished a few hours before, or were sent incomplete. Now the makers are patterning after those newspapers whose evening editions are on the streets at 7 A.M., so that though it is yet but April, and the season is not in full swing, 1908 models are beginning to appear. One of the first to be uncovered is the six-cylinder Stoddard-Dayton shown by the accompanying photograph. It is to be a 50-60-horsepower, seven-passenger car, with a 128-inch wheelbase and 36-inch wheels. One of the features of the power plant will be the use of duplicate ignition systems, one of which will employ the Bosch magneto. All on, the car will weigh 3,500 pounds, and no doubt will be a worthy addition to the Stoddard-Dayton line.

AN M. D.'S UNUSUAL RECORD IN A MAXWELL.

Not many autoists can point to a mileage such as Dr. Hess—a well-known ministrator to the ills of humanity on a part of the Pacific Coast—has rolled up in his Maxwell within the past year or so. Even more remarkable than the fact that he has driven his Maxwell Tourabout 16,000 miles in that period, is his achievement of making 12,000 miles on a single set of tires, which speaks well for both car and driver. Dr. Hess considers the automobile an indispensable adjunct to every up-to-date physician's outfit, not alone on the score of convenience, but that of economy as well, for on occasion he was compelled to charter a special train to reach a patient in a remote part of his district before becoming an autoist. The accompanying photograph shows the doctor in his 1906 Maxwell, and he has already placed his order for a 1907 model of the same make.



DR. HESS IN HIS RECORD-BREAKING MAXWELL.

RECENT TRADE DOINGS AT AKRON.

AKRON, O., April 22.—The B. F. Goodrich Company, largely on account of the growth in its tire trade, expects to begin work on a new five-story addition within two weeks for factory purposes. The building will be devoted to other manufacturing in addition to tires also. The company is also arranging to construct at the same time an immense office building which will be five stories high and 125 feet long by 50 feet wide. This will be devoted to office work solely, and will be one of the largest office buildings in the country. The company is now employing 2,700 people. Both buildings will be constructed of fireproof reinforced cement similar to the additions constructed last year.

It was announced last week that the International Harvester Company, with headquarters at Chicago, will begin the manufacture of farmers' auto wagons in the plant here that was acquired from the Aultman & Miller Company after that concern's failure. Although the real intentions of the company are kept a secret here, it is said on excellent authority that such is the intention. The company will also make a wagon suitable for milk dealers. It has been making a number at Chicago, and it has been found that the wagons take well.



BOSTON BRANCH OF THE H. H. FRANKLIN MFG. CO.

The new store of the air-cooled Franklin is located at 671 Boylston street, in the center of the local trade.

GOOD ADVICE BY AN AUTO CLUB PRESIDENT.

Charles J. Swain, president of the Quaker City Motor Club, Philadelphia, gives the following advice in the course of an article on "Courtesy on the Highway":

"I would lay special stress upon consideration for the farmer. The use of the road is to him a necessity. Through him largely it is maintained. If for no other reason, it were policy to secure his good will. The harboring in his mind of an injury, real or fancied, cannot but incur his enmity, and he has much to forbear at best. To sum up the whole situation, the motorist on the road can ill afford, for the sake of the sport, to make a single bad friend by any act of omission or commission."

BARNEY OLDFIELD AND HIS GREEN DRAGON.

At San Diego, Cal., on Sunday last, Barney Oldfield drove his Peerless Green Dragon a mile in 54 seconds, which is one second under the circular track record held jointly by himself and Walter Christie. A kick from the starting crank had given Oldfield a bruised arm, but did not prevent him from appearing before the large crowd. A 50-mile race was won by A. B. Daniels with a six-cylinder Stevens-Duryea, his time for the distance being 1 h. 1 min. 20 3-5 sec., lowering the previous mark for stock cars. A 50-horsepower Haynes was second, and a punctured tire spoiled whatever chance it had of giving the winner a harder tussle.



COACHING RUNNERS WITH A COLUMBIA TOURING CAR.

Coach Crooks of Columbia University directs the practice of his athletes with up-to-date methods.

SPRING AUTO SHOW FOR NEW ENGLAND.

SPRINGFIELD, MASS., April 22.—There is every indication of Springfield's first automobile and power boat show being a success. May 25 and June 1 have been fixed as the opening and the closing days, and the location selected is Hampden Park. Here a huge waterproof tent will be erected, divided into nearly eighty stands, each one having accommodation for one car. Exhibition space costs \$30 for the side stands and \$40 for the center positions. In the way of side attractions there will be races on the mile and half mile track, hill climbing contests and motor boat races on the river adjoining the park, for all of which events valuable prizes will be offered. The general management of the show is in the hands of William E. Dobbins, but a committee from the Automobile Club of Springfield has been appointed to co-operate in the attractions.

RENAULT RACING RUNABOUTS FOR AMERICA.

At the suggestion of W. K. Vanderbilt, Jr., the Renault firm has decided to construct fifteen special racing runabouts to develop over sixty horsepower, and attain a speed of seventy-five miles an hour. Ten of these have been reserved for Mr. Vanderbilt and his friends, and five are still for sale. The cars will be similar to the racer with which Szisz won the French Grand Prix last year, and will have two-seated racing body.



MISS JULIA SANDERSON TAKES A SPIN IN HER AEROCAR.

This popular actress, who has recently entered vaudeville, drives daily with her mother, who occupies the tonneau.

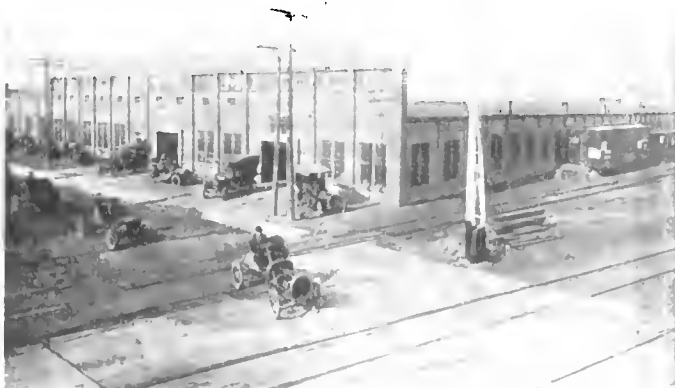


R. W. HEY, WHO WILL PILOT THE LONG-DISTANCE LAMBERT.

TAKING THE LONGEST WAY ROUND.

Rather a unique trip is about to be undertaken by Rodney Wellington Hey, late of Bozeman, Mont., but who for the next year or more will circulate around the borders of the United States in a Lambert friction-driven car. The start will be made June 1 from New York City on what may well be termed the longest continuous American trip possible, as the boundary line is not to be overstepped at any place. The route, as mapped out, includes the Atlantic Coast line to Florida as the first stretch, then around the Gulf along the edges of Florida, Alabama, Mississippi, Louisiana and Texas. At the end of the coast line of the latter State the first step in land will be taken after many thousand miles of coastline, and even at that, the change will merely be from ocean to river for a considerable part of the distance, as the Rio Grande will be followed, and again further west the Colorado will be met and followed part way to its source, where it crosses the southern boundary of California.

From there on there will be another long stretch of seacoast along the Pacific until Seattle is reached. At the latter place the longest installment of inland travel on the entire journey will be undertaken, following the line of the Canadian boundary eastward until the shores of Lake Superior are met, then down along Lake Michigan to Chicago, from which point the trip east to New York will still be continued as closely as possible to the Canadian border. In addition to forming one of the longest and most arduous tests to which a car has been put, this twenty-thousand-mile trip is also expected to constitute a record in other respects, as no time is to be lost unnecessarily, only brief stops being made in the larger cities along the route. Mr. Hey will be accompanied by a mechanic, and does not anticipate meeting any difficulties that cannot be overcome by grit and a determination to get through in spite of every obstacle.

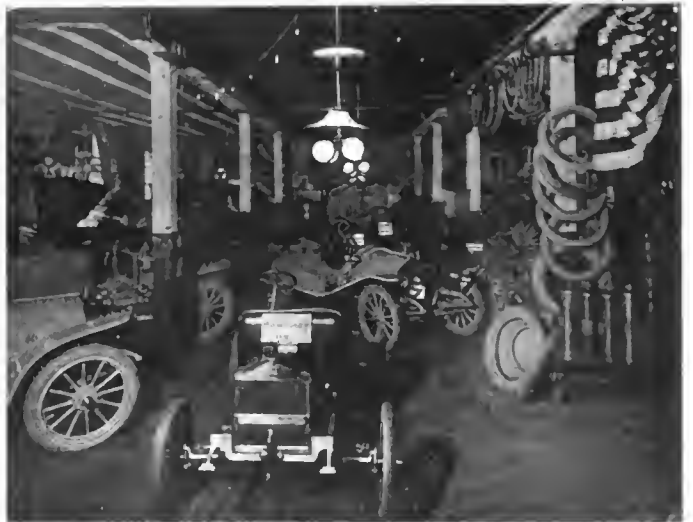


BUCKEYE MFG. CO.'S FACTORY, WHERE THE LAMBERT IS MADE.

SUCCESS OF A PRIVATE SHOW IN ROCHESTER.

If you cannot get anyone to help you hold a show, why hold one yourself and show the other fellows how to do it. Such are the sentiments of A. M. Zimbrich, of Rochester, N. Y., and that they are well-founded was recently demonstrated by his carrying them into effect with no uncertain result. Rochester is a busy automobiling center, and Mr. Zimbrich thought it would be only in keeping with its dignity as such to hold a show of its own. He tried to interest the other dealers in the city, but they were not enthusiastic; so, nothing daunted, he went at it himself.

The new establishment, at 45-49 South avenue, Rochester, afforded an excellent place to hold it. Music was provided and souvenirs distributed, and the event was liberally advertised in the local papers. The result far more than exceeded expectations. The salesrooms were filled to overflowing every afternoon and evening, and a number of sales could be traced directly to the holding of the show, besides which a great many people were interested who could not have been met in any other way. Mr. Zimbrich is exclusive agent for the Stoddard-Dayton, Maxwell and Dolson lines, and makes an excellent showing of them, as will be apparent from the accompanying photograph of the interior of his establishment. Judging from the remarkable success which attended his efforts in the show line, there appears to be no reason why any dealer similarly situated should not do likewise.



A. M. ZIMBRICH'S AUTO SHOW AT ROCHESTER.

ANOTHER FACTORY FOR GRAND RAPIDS.

GRAND RAPIDS, MICH., April 22.—A. C. Menges, formerly of the Harrison Motor Company, is planning to bring out a machine of his own design in the near future, from which it is thought that Grand Rapids will, before long, become the home of another automobile factory. The car is to have several special features, not the least interesting of which is to be a hydraulic self-starting device; it is to be high-powered, and will tip the scales somewhere in the neighborhood of 2,700 pounds complete, listing at \$5,000. The company is to be capitalized at \$500,000, and expects to undertake the work of getting its car on the market in the near future—probably in time for the Fall shows.

A DELAWARE CITY'S COMMERCIAL AUTOING.

WILMINGTON, DEL., April 20.—The Delaware Auto Storage and Repair Company, which has a large garage at Eleventh and West streets, has added a carryall to its equipment, a "seeing Wilmington" vehicle, which has become quite popular.

The Dragon Run Dairy Company is using an automobile in connection with its milk and cream business in the city, and other interests will no doubt join the ranks in the near future.

STRATTON TO MANAGE TRADE ASSOCIATION.

Owing to the great amount of detail work involved in the management of the New York Automobile Trade Association and the fact that the officers of the association have so many other demands upon their time that they are unable to devote any attention to the business of the latter, the need of an executive head for the organization has been felt for more than a year past. Ezra V. Stratton, whose portrait is published herewith, has been appointed to the position with the title of general manager and will act as the executive head of the association so far as the general run of business is concerned, no change being made in the personnel of the officers on this account. Though previously not directly connected with the automobile industry, Mr.



EZRA V. STRATTON.

Stratton has a wide acquaintance among the trade, gained in his capacity as freight agent for the Seaboard Air Line, where he attended to most of the automobile shipments made to the South for the Florida races annually.

E. R. THOMAS TO MAKE MOTOR CABS.

BUFFALO, N. Y., April 22.—The making of motor cabs and town cars on a large scale is the latest announcement from the E. R. Thomas Motor Company. The plans for the making and marketing of these cars have been under consideration for over a year. During that time Gustave Chedru, head of the foreign engineering department of the company, has been conducting investigations in Paris.

Details of the construction of the new motor cabs will not be given out, according to the present plans of the Thomas company, for several months, but a general description would show that the car has a four-cylinder water-cooled motor, shaft drive, a three forward speed and reverse transmission and a wheelbase of 100 inches. The greatest saving in weight comes in the motor, which, because of the ultra advanced ideas used in its construction, will not weigh, approximately, more than half what the present day motors of about the same horsepower do.

ALBANY CLUB TO HAVE A ROAD RACE.

ALBANY, N. Y., April 24.—The Albany Automobile Club is up and doing. In addition to its annual run through two or three States, it now proposes to have a road race of its own, and has applied for and secured from the county supervisors permission to close the "River road" from Corning's farm, just south of Albany to Selkirk, in the town of Bethlehem to the southward, the "old stone road" from Selkirk to Becker's Corners, and the road back to point of starting, on the afternoon of September 14, between 3 and 6 p.m. The sheriff was authorized to appoint deputy sheriffs to patrol the course. They will be paid by the club.

The Saxe bill, to permit the formation of companies to insure motor vehicles, is now before Governor Hughes, and will probably be signed this week.

ABOUT THE MOTOR FUEL PROBLEM.

Although the production of crude petroleum in America is making enormous strides every year, the bulk of this comes from new territories, which yield heavy oils containing little or no spirit, says *The Engineer*. In fact, the fields which have in the past supplied the world with petroleum spirit and high-class illuminating oils are, it is said, failing, so much so that the center of production is no longer in the Eastern States, but lies equally between the Gulf States and California.

A QUAKER GIRL WHO DEMONSTRATES.

PHILADELPHIA, April 22.—A bright and pretty Quaker girl, Miss Vera Brewster, has opened the way for a feminine invasion of a field of endeavor hitherto monopolized by the male biped—demonstrating an automobile. Miss Brewster last week signed with the Foss-Hughes Motor Car Company here to demonstrate and sell the Baker electric car, which that firm represents in Philadelphia in connection with the Pierce and Cadillac.

Miss Brewster's personality is most charming, and when interviewed by THE AUTOMOBILE representative gave her reasons for "taking up men's work," as some of the local dailies put it. "Why not?" she said. "The occupation requires no special exercise of muscular power. To keep cool; to keep one's eyes open—those are sufficient. And the work is delightful to me. As for learning how to operate an electric car—this car"—and she patted the handsomely upholstered seat beside her—"it is nothing. Any woman with a little determination and an average amount of brains can master it in a day. No; I have no special taste for mechanics. Indeed, my folks had other plans for me. I was educated in a convent in Cincinnati, my birthplace, and afterward attended Mmes. Thavenet and Taylor's 'finishing' school at Neuilly, a Parisian suburb. Then I acquired the higher education fever and prepared for Bryn Mawr. When ready to enter that institution of learning the close application to my studies had so undermined my health that I was compelled to abandon the project. On my recovery I took a course of interior artistic decorating, but again the confinement indoors sickened me, and that I also abandoned. Finally, the necessity of taking up some outdoor occupation forced itself upon me, and after giving the matter no little thought I decided to be the pioneer in a new feminine profession. I argued that if women could be convinced of the ease with which automobiles—electric cars especially—can be operated, many of them would become purchasers. I presented my plan to Messrs. Foss and Hughes, and within a very short time became a qualified demonstrator. While I work hard and the hours are long, the work is charming and healthful.

"I have already discovered that many women who would hesitate at taking lessons from a man demonstrator will eagerly embrace the opportunity of acquiring automobile knowledge from a woman. Hence, I feel that by applying myself to this work and acquiring a knowledge of the car, I can make myself doubly valuable to my employers.

"Philadelphia, with its level asphalt streets, is admirably adapted to the small electric car, and I am firmly convinced that I can arouse among Philadelphia women a desire to own and run such cars. Cleveland has upwards of 200 of these small machines, many of them operated by women. Boston, Washington, Chicago and New York are not far behind. I may be instrumental in getting this city interested. That is what I am working for. You will have to excuse me now. Here comes my 'prospect.'"



WALTER BAKER TOURING IN FLORIDA WITH HIS PEERLESS.



EXTERIOR OF THE MORRIS GARAGE AT WESTCHESTER, N. Y.

THE INCREASING LIST OF GARAGES.

Dave H. Morris' Model Fireproof Garage.

Up to a certain point the adaptation of the private stable for garage purposes satisfies all requirements, but it is not long before the enthusiastic autoist finds that such a plan of housing his car has serious drawbacks, not the least of which is the ever-present danger of fire. The majority of stables are of frame construction, and even where stone or brick are employed for the walls, the interior is so generously furnished with combustible material as to render the use of such a building a constant menace. Autoists who have given the subject any consideration have found the best solution in a building specially planned for the purpose, an effective combination both from the artistic and utilitarian point of view being that of concrete and terra-cotta as employed in the model fireproof garage recently erected for Dave H. Morris, at Westchester, N. Y. The attractive appearance of the building is evident from the accompanying photograph, while a second view shows its spacious interior. This measures 17 by 26 feet and is entirely devoted to the cars. There is storage space for two large cars besides a drain table for washing. Back of this main room there are two smaller rooms, one fitted as a workshop and the other housing the heating apparatus for the building. A steel tank, encased in concrete and buried some distance from the garage, stores the fuel supply. On the upper floor are located the chauffeur's quarters. The plans were executed by the New Century Contracting Co., New York City.

Modern Garage Close to Harvard College.

CAMBRIDGE, MASS., April 22.—The Harvard Automobile Company has just moved into its new garage on Quincy Square. The location is very favorable, being opposite the college yard and near the large dormitories on Mt. Auburn street. Last year the company occupied a small wooden building on the same site, but the demand was so great that it was decided to erect a more suitable structure.

The new garage has a frontage of 125 feet on Quincy Square and is 200 feet deep; it is two stories high, and built of reinforced concrete, fireproof throughout. On the first floor are the main storage room, the waiting rooms and lavatories, and an office overlooking the door by which all cars must enter and leave. Above, the space is given over to storage and repairs. The machine shop is equipped with lathes, planer, shaper, drill press and portable drills, and is in charge of competent mechanics. An air compressor is provided for cleaning and inflating tires. Heating is by steam, with boilers in a separate building. The total capacity is from 160 to 200 cars.

Many Harvard students own automobiles, and quite a number have foreign cars. A look through the garage showed two Panhards, a Brasier and a Fiat. The manager is Roy Faye, who

is well known among Boston automobilists. The company has the agency for the Matheson and Atlas cars, and in addition does a large renting and supply business.

Work Resumed on Portsmouth Garage.

PORTSMOUTH, N. H., April 22.—Work has just been resumed on the new garage here, after being suspended for several months. The exterior of the building is already completed, but the interior—concrete floor, machine shop, offices, lavatories, waiting rooms—will not be ready for occupancy before about the first of June.

The Granite State Fire Insurance Company, which owns the property, has leased it for a term of years to H. L. Beacham, proprietor of a livery stable in this city. Besides being one of the most commodious, the lessee promises that it will also be one of the finest and most thoroughly up-to-date in New England.

The poor accommodations afforded automobile parties in the care and stabling of their cars here, during the last two seasons, have caused loud complaints by tourist and summer resident alike, and, no doubt, the erection of so fine a garage will be hailed with satisfaction by all who patronize it. The Granite State Fire Insurance Company is sparing no expense in the construction of the building, which will involve an expenditure of at least \$17,000.

New Link Between Philadelphia and the Water Gap.

W. H. Pearce, at one time a well-known bicycle racer, and later a salesman and demonstrator for the Philadelphia branch of Thomas B. Jeffery & Co., has just opened a modern garage at Bangor, Pa., having been granted the exclusive agency for the Rambler cars in Northampton County, Pa. The establishment will be known as the Bangor Auto Garage, and will have a first-class equipment of power-driven machine tools with every facility for undertaking all kinds of repairs, Mr. Pearce himself being an experienced machinist. Something like \$1,500 have been spent on fitting up this part of the garage alone. In addition to being located on the direct line between Philadelphia and the Delaware Water Gap, one of the most popular summer resorts in that part of the country, the new garage at Bangor is also the last stopping place after leaving Bethlehem, Pa., for Scranton, or Wilkes-barre. That immediate success has rewarded the efforts of Mr. Pearce may be judged from the fact that he has already disposed of something like four carloads of Ramblers, all for early delivery, and some of which are now coming through. During March he averaged three or four cars a week.



HOW THE INTERIOR OF THE MORRIS GARAGE LOOKS.

Two New Garages Open in Toledo.

TOLEDO, O., April 22.—Last week saw the opening of two new garages in this city. The Toledo Motor Car Company now occupies and conducts the Coliseum garage at the corner of Bancroft street and Ashland avenue in connection with its garage on Madison avenue. The Coliseum garage is the largest in the city and embodies the private stall idea as well as all the other late ideas along garage lines.

The Craig-Toledo Automobile Company, which is manufacturing an automobile by that name at Dundee, Mich., has leased the White garage on Madison avenue. This garage was built for the White company by the Spitzers, but since the entire output of the White factory has been sold the garage was of little use and that company had previously not operated in this city.

Springfield to Have an All-Night Garage.

SPRINGFIELD, MASS., April 22.—What is known as the Bemis property on Taylor street has recently been acquired by Theodore Geisel. The lot is 127 feet deep, 144 feet on the rear line and 126 feet street front, with a 20-foot passageway on each side. It will be utilized by the Geisel Automobile Company, of this city, for a modern garage, the plans for which are already completed. At present this will only occupy one corner of the property measuring 55 feet front by 127 deep. The roof will be trussed so there will be no posts to obstruct the floor. Later on the building will be extended to cover the entire property. As it is situated close to the leading hotels and just off the main street, transient trade will be catered to, and mechanics kept on duty all day and night. The contract for the construction of the building, which will be of brick and concrete, has already been awarded. The front will be largely composed of plate-glass windows.

Modern Garage Between Cleveland and Toledo.

ELYRIA, O., April 22.—It will be of interest to autoists generally to learn that another modern station has been completed on the main route between Chicago and New York, and to northern Ohio autoists particularly, as the new Leonard garage in this city is said to be the best between Cleveland and Toledo. The new building is situated on Broad street one block north of Fremont and extends north. It measures 117 feet in depth, and provides about 10,000 square feet of floor space. A modern and completely equipped machine shop capable of executing all kinds of repairs is maintained and an up-to-date service in every respect furnished. H. M. Leonard is the owner, and the establishment is known as Leonard's Auto Station.

New Garages Springing Up in the Windy City.

CHICAGO, April 22.—Within the past few weeks there has been unusual activity in the fitting up of new garages in anticipation of the coming season's business. One of these, known as the Chicago Auto Garage, which has located at 3210 N. Clark street, has been granted the sub-agency for the Reo and Premier cars, in addition to which it will carry on a general garage business. A few blocks south another general garage and salesroom has been opened at 3096 N. Clark street. This is owned by M. L. Barrett, for whom the building was specially erected. It measures 50 by 116 feet and is modernly equipped throughout.

IN AND ABOUT THE GARAGES.

Savannah, Ga.—A garage and repair shop has been opened at 314 St. Julian street, west, by F. C. Kramer and G. W. Wroten, who have recently formed a partnership.

Kansas City, Mo.—A new garage has been opened here by the Kaw Valley Auto Company, agents for the Premier, and the Mason Car Sales Company, at 3131 Main street.

Des Moines, Ia.—A garage has been opened by the Goodwin Automobile Company, which has taken the agency for the

Rambler and Mason cars. The building is located at 612-616 Mulberry street.

Champaign, Ill.—The Champaign Automobile Company, of this city, has been incorporated to establish a garage. J. C. Richmond and Manford Savage are the interested parties.

Huntsville, Ala.—An up-to-date garage is to be established by the Huntsville Motor Car Company, which has leased for a term of years a new building in course of erection on Gallatin street. The building is of concrete and iron and brick.

San Francisco, Cal.—Under the title of the Mission Garage, a large establishment has been opened to do a general garage business at 611 Valencia street, between Seventeenth and Eighteenth streets, by D'Arcy, Scott & Co. It is one of the most modern establishments of its kind that the city can boast.

Grand Rapids, Mich.—With the completion of the establishment of the Luce-Banks Company, on North Division street, Grand Rapids may well lay claim to growing prominence as an automobiling center, for this makes her eighth garage, and some of them are establishments of imposing proportions for the size of the city.

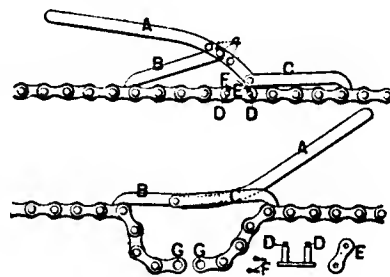
Montclair, N. J.—Under the management of W. H. Higgins, Jr., the garage formerly operated by the Montclair Auto Station has been reopened, and will be run by a new company composed of Montclair business men; the members are C. D. Vreeland, W. H. Higgins and W. H. Higgins, Jr., all of upper Montclair. The company intends to sell machines as well as storing and repairing them, and expects to obtain the agency for a popular car in the near future.

Crown Point, Ind.—That road and street improvement and automobiling go hand in hand was never better illustrated than in this part of the State of Indiana, where, as the result of general attention to improvement on the part of the authorities, C. M. Baker, who is the local agent for the Rambler cars at this place, reports that interest in automobiling has increased considerably. The outlook for a successful season was never better, says Mr. Baker, much of it due to the prospect of better roads.

TOOL FOR MOUNTING SIDE CHAINS.

Dismounting and remounting the side chains of a big car is not the cleanest of jobs, nor the easiest if you are single handed. If the chain is at all tight, the operation of bringing the two ends of the chain together in order to pass the bolt through is one that requires some patience. To simplify this task a French

chauffeur has devised a simple tool, the illustration of which is reproduced below from *Omnia*. It consists of three metal arms, two of which, B and C, have their extremity curved to hook around the links of the chain. A is the lever operating the tool. The arm C is hinged to the extremity of the lever A.



FRENCH TOOL FOR MOUNTING CHAINS.

The arm B has a stud riveted into its end, allowing it to be placed in any of the holes drilled in the lever, thus giving a longer or shorter range of action, as required. It will be noticed that the lever is slightly curved, this being necessary in order that it may remain in position when the tool is in use, as shown on the lower sketch. Any number of holes may be drilled in the lever, but they should always be in the curve. The tool is one that any mechanic can make, and the labor spent in constructing it will be amply repaid by the value of the instrument in every-day work. It will certainly prove a great time saver.

BRIEF ITEMS OF NEWS AND TRADE MISCELLANY

All the 300 Frontenac touring cars to be made by the Abendroth & Root Manufacturing Company, of Newburgh, during 1907, will be equipped with Trauf-fault-Hartford shock absorbers.

Owing to increase of business, the Tut-hill Spring Company, of Chicago, has decided to call a meeting of stockholders to vote upon the question of increasing the capital stock from \$50,000 to \$100,000.

The old-established carriage building firm of S. C. Pease & Sons, Merrimac, Mass., has entered the automobile field and is now prepared to do a big business in automobile bodies, particularly in limousine and landaulette styles. All body repair work is undertaken.

The F. B. Stearns Company of Cleveland a few days ago delivered to former Governor Myron T. Herrick of Ohio one of the finest machines ever turned out of the factory. It is a large seven-passenger Pullman body touring car, handsomely trimmed and equipped.

So many applications for work at the new Rainier factory at Saginaw having been received at the New York office, the company has made the announcement that such applications should be directed to James G. Heaslet, factory manager, 820 West Warren avenue, Detroit, where they will be given due consideration.

A. R. Bangs, who, since he retired from the Franklin agency in Boston, has been busy in his machine shop, promises the first public view of the completed Viking next month. The machine will have four cylinders, will develop 40-horsepower, will have bevel gear drive and 120-inch wheelbase. Selling price will be \$3,000.

Contracts involving an expenditure of \$100,000 have been let by Thomas H. Midgley, consulting engineer of the Rubber Goods Company, for a large addition to the plant of the Midgley Manufacturing Company, on Dublin avenue, Columbus, O. The present area of the plant, used for the construction of wheels, rims and other parts of automobiles, will be increased by more than two-thirds.

There is no mystery about starting a motor from the seat on the spark. The explanation is that so long as compression is held in a cylinder, the spark can be used to ignite the charge and start the motor. At St. Louis, the other day, it is reported that a Winton Type XIV was started from the seat on compression that had been held an entire week, as the result of perfect fitting cylinders, pistons and rings.

A man who has been a member of the American Automobile Association since it was launched, made a pat remark recently when he said that any motorist who does not join the national body is no better than a tax-dodger who enjoys the benefits of municipal work and shirks contributing his share. He has representation without taxation, and, similarly, all motorists share to some extent in the good work done by the A. A. A.

Indestructible steel wheels, made by the Turner & Fish Company, Chicago, are used on the somersault automobile in the thrilling feat at the Ringling

Brothers' circus. The landing of the car produces a crash of 9,000 pounds, the speed being equal to 42 miles an hour, and the car weighs 2,000 pounds, dropping in midair 30 feet after the somersault. The wheels were regular 16-gauge pleasure car wheels.

C. N. Sauerbach, the exclusive agent of the Mitchell Motor Car Company in Europe, will place his repair shop at the disposal of American tourists and those competing in the American Gold Cup Tour this coming season. Any spare parts of automobiles sent to the Mitchell Car Agency, 27 Rue d'Aboukir, Courbevoie, near Paris, France, will be taken care of and forwarded, upon request, to any individual owner of such parts. Mr. Sauerbach will also supply information which might interest foreign tourists.

The F. B. Stearns Company of Cleveland will increase the capacity of its factory on Euclid avenue by the addition of about 10,000 square feet of floor space the coming summer. Later additions will be made that will double the capacity. The company has ordered a number of German gear cutting machines, such as cannot be found in this country. Roy F. York, sales manager of this company, is now in San Francisco, and will go on up the coast to Seattle before returning to the home office.

At the annual meeting of the stockholders of the Joseph Dixon Crucible Company, of Jersey City, N. J., the old board, consisting of Edward F. C. Young, John A. Walker, Edward L. Young, William Murray, George T. Smith, Joseph D. Bedle and George E. Long, was unanimously re-elected. The board of directors re-elected the former officers, namely, E. F. C. Young, president; John A. Walker, vice-president and treasurer; George E. Long, secretary. Judge Joseph D. Bedle was also re-elected as counsel.

George K. Wheeler, sales manager for Columbus Electric, made by the Columbus Buggy Company, Columbus, O., has just finished one of the longest trips made by a sales manager, having since November 1, 1906, visited every city in the United States and personally looked over the situation as regards the possible market for electric carriages. At the present time the Columbus is represented in the majority of the cities of the United States. The factories are making large shipments daily to all portions of the country, and have recently put up an addition to the plant to take care of the increased automobile business.

Progress on the two Dragon racers which are being built for the Vanderbilt Cup race is being reported daily to the officers of the Dragon Automobile Company. According to these reports, it is apparent that the racing Dragons will be ready on schedule time, May 15, which is the date set for completion of tests on the finished engines. July 1 is the date arranged when cars will be running on the road, and the company is now giving considerable thought to the matter of drivers for these cars, but as yet no selections have been made. A special

building on the factory grounds has been set aside and is being prepared to be used solely for work on the racing cars.

The most noticeable feature of the past season, according to F. A. Babcock, president of the Babcock Electric Carriage Company, is the increase in the number of women who drive their own cars. The increase is probably more noticeable in the electric line than in gasoline or steam. There are no complications, there is no need of a chauffeur. Madame can wear her nicest and daintiest frocks, and she does not have to strain her voice to carry on a conversation with her companion. All these things appeal to a woman, and there is not a lady who ever rode in an automobile who has not hopes that some day she can sit at the wheel and drive her own car over the boulevards and through the parks.

COMING TRADE REMOVALS.

The Olds Motor Works has arranged to take over the agency of the Olds machine, which has been conducted by the Bailey Company on Prospect avenue, Cleveland, O., under the name of the Oldsmobile Company. The room on Euclid avenue recently vacated by the Aerocar Company has been secured and a complete sales room and repair shop will be established. The location is in the midst of the motor colony of the city.

The H. J. Koehler Sporting Goods Company has just executed a long lease for the premises at the northwest corner of Fifty-fourth street and Broadway, New York City, where the Buick agency will be carried on, the old establishment having been located a few blocks further down Broadway for several years past. In addition to this, branches are maintained at Newark, Paterson, Montclair, and East Orange, N. J., for the agencies of the Buick, Corbin and the Pope-Waverley electric cars.

Owing to the great increase in the demand for their specialties during the past year, both the Crown Battery Company and the Tire Safety Device Company, the former of which has been located at 47 Warren street, New York, and the latter at 208-14 West 124th street, will remove to a new factory at 992 Southern boulevard. With the added facilities installed in the new establishment, the plant will have a capacity four times greater than that previously enjoyed. C. R. Bissell is vice-president of the Crown Battery Company and general manager of the Tire Safety Device Company.

Another May 1 removal will be the shifting of the Diamond Rubber Company from its old quarters to new and more spacious surroundings in the new Motor Mart at 1876 Broadway. They have been finely fitted up under the direction of Theodore Wiegale of the home office, who has come on to assist H. J. Woodard, the New York branch manager. Ever since the beginning of the industry the Diamond Rubber Company has had a branch at 1717 Broadway, so that with its removal further up-

town a landmark will disappear. The New York headquarters, for many years at 78 Reade street, will be consolidated with the new uptown store.

Next week the New York branch of the Corbin Motor Vehicle Corporation will take up new quarters in a prominent location on New York's automobile row. It will occupy the northerly end of the big store in the building of the American Locomotive Auto Company, at 62d and 63d streets and Broadway, the latter concern maintaining a large salesroom for their American Berliet cars on the same floor. The old Corbin quarters at 1779 Broadway will be given up on May 1. The new establishment affords a plate glass frontage of 40 feet, so that the Corbin will be prominently displayed. In line with its well-established policy at branch houses, the Corbin company will maintain a complete repair department.

NEW AGENCIES ESTABLISHED.

One of the first active steps taken by the new management of the Acme Motor Car Company, of Reading, Pa., since its reorganization by H. M. Sternbergh, who is now its president, has been the appointment of Theodore E. Schultz as New York representative. Mr. Schultz's establishment is at 1843 Broadway.

Up to date the Forest City Motor Car Company of Massillon, O., manufacturers of the Jewel automobiles, has established no less than forty-one agencies throughout the country. In addition to locating in most of the principal cities from coast to coast, a large number of agents have also been appointed in smaller towns, as well as a general foreign agency at London, Eng.

A. E. Schwartz, the representative abroad for the American Motor Car Manufacturers' Association, has formed the American Auto Supply Company in Paris, with headquarters at 102 Rue la Boetie. It is expected that the place will become headquarters for Americans while in Paris, as Mr. Schwartz is well informed on foreign conditions, including licenses, passports, and similar necessities for travelers.

The Michigan Storage Battery Company, with main offices and works at Detroit, Mich., have just opened a New York branch at 2330 Broadway, near Eightieth street. Complete stocks will be carried at all times, in addition to which a thoroughly-equipped charging and repair station will be maintained. George S. Morrow has been appointed manager of the new branch house, and will be assisted by a number of expert battery men sent direct from the factory.

The Dupont Garage Company, having acquired the Washington branch of the Electric Vehicle Company, has become the agent in that territory for the Columbia cars, both electric and gasoline. The Rambler and Cleveland lines, formerly carried by one of the stockholders of the company, have been discontinued. In addition to its main establishment at 2020 M street, Northwest, the company will also continue its commercial branch in the old Panorama Building at Fifteenth street and Ohio avenue.

PERSONAL TRADE MENTION.

R. D. Aldrich has resigned his position as manager of the New York branch of the Rose Manufacturing Company to

become sales manager of the Twentieth Century Manufacturing Company, 19 Warren street, New York City.

A. H. Dorsey, who was formerly connected with the sales department of the Harry Fosdick Company of Boston, has been elected vice-president and general manager of the United Motor Car Company of Philadelphia, which is agent for the Thomas car in that city.

It has been erroneously stated that George C. John has severed his connection with the St. Louis Car Company, makers of the American Mors. It seems that while F. J. Pardee has been made sales manager and will remain in charge at the factory, Mr. John will continue his connection with the St. Louis company.

J. H. McDuffee, of the McDuffee Automobile Company of Chicago, which handles the Stoddard-Dayton, De Luxe and Kisselkar in the west, has gone to Arizona for several months respite from business. Mr. McDuffee has been in poor health for some time, and has been advised by his physicians to rough it for several months away from the haunts of civilization.

Frank S. Corlew has announced his resignation as vice-president and manager of sales of the Dragon Automobile Company of Philadelphia, to take effect May 1. Mr. Corlew will announce in a short time his plans in connection with the automobile business which he states will be of interest not only all over the country, but especially so to the New England trade.

F. G. Carrie, representing the Electric Vehicle Company of Hartford, Conn., will have headquarters in Havana, Cuba, for the next few weeks, where he will show and demonstrate the high and medium-powered Columbia gasoline cars and the Columbia electric victoria phaeton. Mr. Carrie for some time past has been connected with the New York branch of the Electric Vehicle Company.

In order to properly handle the increasing sales, President Horace Delisser, of the Ajax-Grieb Rubber Company, has appointed H. M. DeSilva and R. S. Ireland on the selling force for Ajax tires. Both men are well and favorably known in the trade, having for years been connected with the International Rubber Company. Mr. DeSilva will cover the western territory and Mr. Ireland will devote his attention to the southern trade.

A. L. Kull, for the past few years the well-known representative of the Wayne in New York City, and who lately formed the A. L. Kull Automobile Company, the present representative for the Dragon and Wayne cars, has succeeded Frank S. Corlew as sales manager for the Dragon Automobile Company. Mr. Kull is well known as one of the most active representatives in the automobile

trade, and has the reputation of being a "hustler" of the most advanced type, and the aggressive policy of the Dragon company will be kept up in every detail of the selling department.

RECENT TRADE PUBLICATIONS.

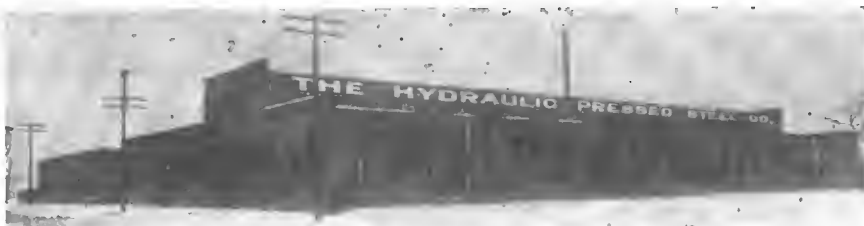
A chapter of accidents and facts are given in the neat folder issued by the Fisk Rubber Company, Chicopee Falls, Mass. The booklet presents extracts from daily papers of automobile accidents caused through tires which burst, and shows how they could have been avoided by the use of the Fisk. There is also a description of how to remove and attach a Fisk tire and an account of the various sundries handled.

Two new catalogues have just been sent forth from the Cadillac Motor Car Company's headquarters at Detroit, Mich. Models K and M are treated in one, and the four-cylinder Model G in the other. A feature of both publications is the excellent half-tone illustrations showing the various mechanical parts of the Cadillac. With the aid of these and the explicit text matter a good knowledge of the cars can be obtained. The booklets are excellently printed in two colors, and smartly bound.

As an elegant piece of designing and an example of skilled typography, the publication from the George N. Pierce Company is far ahead of the usual trade literature. It deals with the new factory just built for the Pierce Great Arrow at Buffalo, N. Y., on the Kahn system of reinforced concrete. This method of building gives a structure as substantial as though carved out of solid stone, fireproof, and possessing the granite-like qualities of concrete with the elasticity of steel. A large number of excellent illustrations show the building in course of construction and several full page illustrations give an idea of the tremendous area covered by the plant.

FAMOUS PRESSED STEEL PLANT.

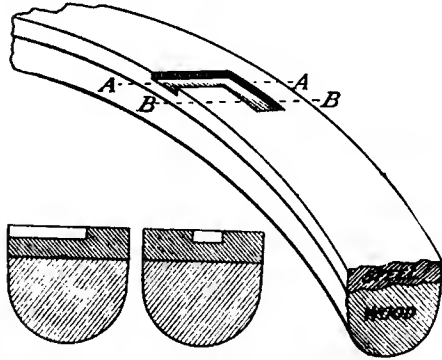
Cleveland can boast one of the largest steel-pressing plants in the country, in the shape of the establishment of the Hydraulic Pressed Steel Company, Cleveland, which makes a specialty of automobile frames and stampings. It is claimed to be the first large plant of the kind especially erected for the purpose, and is, in consequence, equipped throughout with the most modern machinery for turning out work of this class, the main press-room measuring 80 by 200 feet. Some idea of the extent of the factory may be obtained from the accompanying photograph showing a view of it. The concern is backed by well-known Cleveland capitalists, and is managed by James H. Foster, who is also vice-president of the company. The sales end is in charge of Roger B. McMullen, formerly with the A. O. Smith Company.



FACTORY OF THE HYDRAULIC PRESSED STEEL COMPANY, CLEVELAND, O.

INFORMATION FOR AUTO USERS.

Presto Detachable Rim.—This is a device of that class of things mechanical which have the merit of using well tried and thoroughly proven details of construction. The rim carrying the shoe and tube is of the regular standard clincher construction to which is added a number of lugs on its under face. These



SECTIONAL VIEWS OF PRESTO RIM.

lugs are really nuts that are permanently screwed onto inwardly projecting flat headed bolts countersunk into the rim. There are from six to eight of these nut lugs, according to the size of the wheel. Permanently mounted on the wood felloe is a steel band and in this band are cut L-shaped slots agreeing in number with the rim lugs. These right angled slots have their stems running parallel with the rim sides, while the "foot" sections of the slots come out to one edge. It will be seen that this combination gives a series of bayonet clutches. The stems are slightly tapered toward their closed ends to give a wedging effect. At opposite points in the felloe are two spring plunger bolts that act as locks when the rim is in place, the rim having a series of holes extending around it to take these plungers at any point the rim may be put on. To remove a rim, withdraw the two plungers one a quarter turn to prevent them drawing back, move the detachable rim backward about one inch and then toward the operator. The act of replacing is obviously the reverse of the above. By actual demonstration the rim was taken off and fully replaced, time and again, in eight and nine seconds. It is not necessary to match a particular lug on the rim with a particular bayonet slot in the felloe, all these being interchangeable. To take care of this condition, as well as to permit either edge of the rim being started on, there are twice as many plunger holes in the rim as there are lugs. Further information regarding the device may be had from Presto Detachable Rim, 403 Lincoln Trust Bldg., Jersey City, N. J.

A Useful Connector.—The guaranty given with the O. K. Connector, as manufactured by the O. K. Connector Com-



O. K. BATTERY WIRE CONNECTOR.

pany, 51 Waldo street, Worcester, Mass., is that it will not wear out, and that it will show more amperes than others, because of it having a spring tension, making a positive contact. With this

simple little article, a sample of which may be obtained by mail for ten cents, there are no broken or loose connections, and no need for the use of pliers.

"Autoleum" Fireproof Gas Engine Oil.—Realizing the absolute necessity of a special grade of lubricating oil for each particular purpose, and no piece of machinery abounds in different requirements of lubrication more than the automobile, A. W. Chesterton & Company, 64 India street, Boston, Mass., make a specialty of different brands of their "Autoleum" oils for different uses. Particularly such as are required for the high temperatures of the air-cooled motors, also for water-cooled motors, beside "Autoleum" crankcase oils, lubricating greases and the like for both gas and steam engines. In addition, they carry a full line of lubricating accessories.

Automobile Goggles.—There are six distinct styles of automobile goggles manufactured by the Globe Optical Company, of Boston, Mass. All the different types are fitted with ground plano

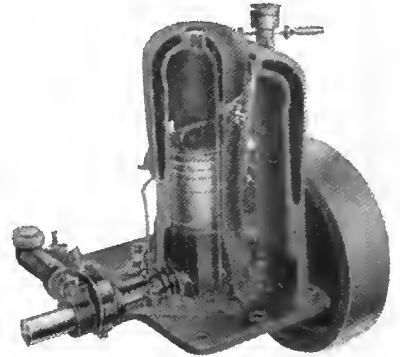


GLOBE AUTOMOBILE GOGGLES.

lenses without focus or power. If desired, however, they can be ground to correspond with prescription of the wearer's glasses, thus avoiding the inconvenience of wearing both glasses and goggles. The lenses are also arranged to give extremely wide range of vision. In four of the styles this is accomplished by using lenses bent to conform with the curvature of the face. The others are of popular four-glass style. Smoke or amber-tint lenses, specially recommended because they protect the eyes from the glare of the sun and improve the acuity of the vision, are also supplied. The four-glass goggles have a patented arrangement for removing lenses. A type specially recommended for ladies is the collapsible, with silk, velvet or chenille binding, with a strap allowing variation of the distance between the eyes. All types are supplied complete in leather case.

Ferro Auto Marine Engines.—There are a number of original and distinctive features in the Ferro two-cycle auto marine engines built by the Ferro Machine and Foundry Company of Cleveland and 79

Cortlandt street, New York. They are made with one, two and three cylinders, and in sizes from 1 1/2 to 25 horsepower. The individual cylinders are made with a flange increasing from bottom up, carry no shaft bearings, have no joints under pressure, no water pipes or visible external connections. These features will be noted from the il-



FERRO TWO-CYCLE AUTO-MARINE ENGINE.

lustration. The pistons have four rings and double piston pin bearings, piston rings and cylinders being ground to an absolute fit. There is no bearing at upper end of connecting rod, the hollow piston pin being rigidly clamped to rock with it, thus giving increased strength and almost double bearing surface. Crank pin bearing cap at lower end is adjustable. Valves are large and adjustable, and there are no pipes to engine whatever. Water enters each cylinder jacket separately near exhaust by hidden branch passage leading directly from large main to pump. Two complete sets of hardened steel ball thrust bearings, one on forward and one on after end of crank shaft prevent any strains on cranks, connecting rods or pistons. Lubrication is assured by a battery of sight-feed valves supplied with oil from a pressure-feed reservoir. The Ferro quick-starting carbureter is of a special type, designed for marine service and conditions. By using the lever-operated compound throttle instant changes of speed can be obtained, varying from 150 to 900 revolutions. With all except the smallest engines the Ferro exhaust silencer is supplied, consisting of exhaust header and condenser silencer combined.

Rex Igniters.—In the 1907 type of Rex igniters, manufactured by the New England Motor Company, Lowell, Mass., a storage battery has been designed which is particularly adapted for ignition work. The grid is of such a form as to absolutely lock the active material in place



THE REX IGNITER.

and prevent it dropping out when in service. The plates are assembled in celluloid jars, each jar having a separate cover. By the use of separate covers, entirely insulated from one another, the charge is retained for an indefinite period. The connection which extends from

the inside of the cells to the outside is of such a design as to reduce corrosion to a minimum. As far as possible brass and nickel parts have been eliminated. All parts are manufactured by the company, thus making it possible to assure the quality of the product with much more certainty than if the work was undertaken by a number of independent firms.

New Weston Multimeter.—This instrument, produced by the Weston Electrical Instrument Company, of Waverly Park, Newark, N. J., is one which will serve the purposes of a direct current voltmeter, milli-voltmeter, ammeter, milliammeter, ohmmeter, ground detector and wheatstone bridge. The part of the multimeter designed to be used for the purposes mentioned is similar to the Weston portable direct-current instruments, but differs from the regular forms in that a special movable coil is employed in the multimeter. The calibrated scale of the instrument has 160 divisions,



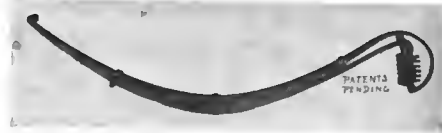
WESTON MULTIMETER, WITH COVER RAISED.

with the zero placed at 10 divisions from the end, so that when the instrument is used as a galvanometer in connection with the bridge, both positive and negative deflections are observed. The wheatstone bridge, which forms part of the multimeter, consists of a rheostat with three groups of coils, adjusted respectively to units, tens and hundreds, aggregating 999 ohms, and a set of five ratio coils. Many novel features are embodied in its construction. All conductors and plug receptacles are placed under, instead of upon, the rubber top.

Puncture Proof Tire Filler.—"Elastro" is the title of a resilient compound for filling pneumatic tires, in order to do away with the possibility of punctures and other mishaps that may befall the tire, whether on a car, motorcycle or even a bicycle. It is a plastic substance injected into the tire while warm and in a liquid state by means of a pump or air compressor and special machinery designed for the purpose. The amount of pressure required is regulated by the weight of the car, so that a tire filled with Elastro lacks none of the features of the regulation pneumatic tire, but cannot flatten or collapse, remaining the same until either the shoe and tube, or both, are worn out. The nature of the compound is such that the makers guarantee it proof against heat and cold, and will, moreover, continue to give satisfactory service even though the tire be full of punctures or cuts. It is made by the Elastro Manufacturing

Company, Hartford, Conn., and it is the purpose of the latter to sell territorial rights for the exclusive use of the compound on a royalty basis, supplying the necessary machinery and equipment. Ernest Cady, manager of the agency department, is also located in Hartford, at 26 State street.

An Improved Spring.—Quite a novel and yet extremely simple method of improving the suspension of a car is being marketed by the Garden City Spring Works, 20th and Purple streets, Chicago.



NEW GARDEN CITY SPRING.

As will be plain from the illustration of the device, its installation calls for no change either in the frame or the hanger. Although shown in connection with a semi-elliptic spring, it is also equally applicable to the full elliptic type. Some of the advantages claimed for it are the reduction of the recoil or rebound by lengthening and softening the spring, so that the car will ride as easily with the driver alone as with the full complement of passengers. It is the invention of D. R. Close, and patents have been applied for.

Atwater-Kent Spark Generator.—While making its famous non-stop record of 6,000 miles last winter, the Thomas Flyer was also making a record performance for the Atwater-Kent spark generator with which it was equipped. Throughout the entire run it was unnecessary to give the spark generator any attention whatever, and the entire distance was made on a single set of six dry cells, which shows that the maker's claims for very largely reduced

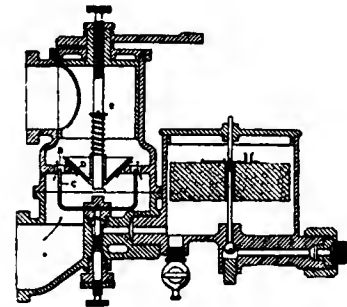


THE ATWATER-KENT SPARK GENERATOR.

battery consumption are well-founded. As shown by the illustration picturing it herewith, the entire system with the exception of the batteries and plugs in the cylinders is comprised of a single, self-contained unit which forms a fitting

ornament for the dash of any car. There are no vibrators, commutators or moving wires, and every part of the system is immediately accessible for inspection without the necessity of leaving the seat. The spark maintains a constant value, regardless of the speed of the engine, which is a decided advantage for easy starting. Moreover, there is only one adjustment necessary, and the circuit is broken in but one place, so that but two platinum contacts comprise the entire wearing parts of the system. The engine may be started by pressing a button, and the driver is also enabled to test the running of each cylinder separately. The model shown is that for four-cylinder engines, but types are also made for three and six-cylinder engines. It is made by the Atwater-Kent Manufacturing Works, 116 North Sixth street, Philadelphia.

The Willet Carbureter.—Easy starting and ability to use low-grade fuel with the same facility as the most expensive are two attributes that the autoist holds in the highest esteem in a carbureter, for failure to start is probably the greatest of bugbears that afflict the driver, and

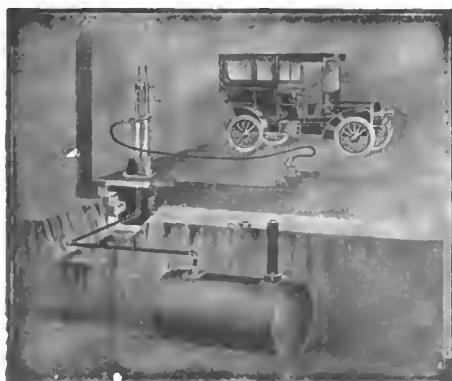


SECTIONAL VIEW WILLET CARBURETER.

frequently it is impossible to obtain anything better than gasoline of a grade that would not be considered for a moment under ordinary circumstances. Add to these the ability to develop plenty of power when throttled way down and to show up at its best when hill climbing, and a combination that is hard to beat is found. It is represented by the Willet carbureter, made by the Willet Engine and Carbureter Co., 764 Ellicott Sq., Buffalo, N. Y. The small number of parts used in its construction as well as the simplicity of the latter will be apparent at a glance at the accompanying sectional elevation of the carbureter. The gasoline inlet and float chamber are shown to the right with the air intake at the left. Instead of the usual single nozzle there are a series of six small tubes, as indicated at C, which form individual nozzles and are fed by the inlet at the bottom, which is regulated in the usual manner. After entering the air passes through a series of small circular openings at B; owing to the restricted area of the latter and the close proximity of the air stream to the jets, considerable gasoline is picked up even at slow speeds. An inverted cone-shaped valve D controls the auxiliary supply of air which is thrown into immediate contact with the vapor-laden air coming from the jets, this arrangement making the carbureter very sensitive. The mixture passes to the chamber E, in which is located a rotary throttle of the usual type. The Willet carbureter is said to have proved very successful in connection with the two-cycle engine.

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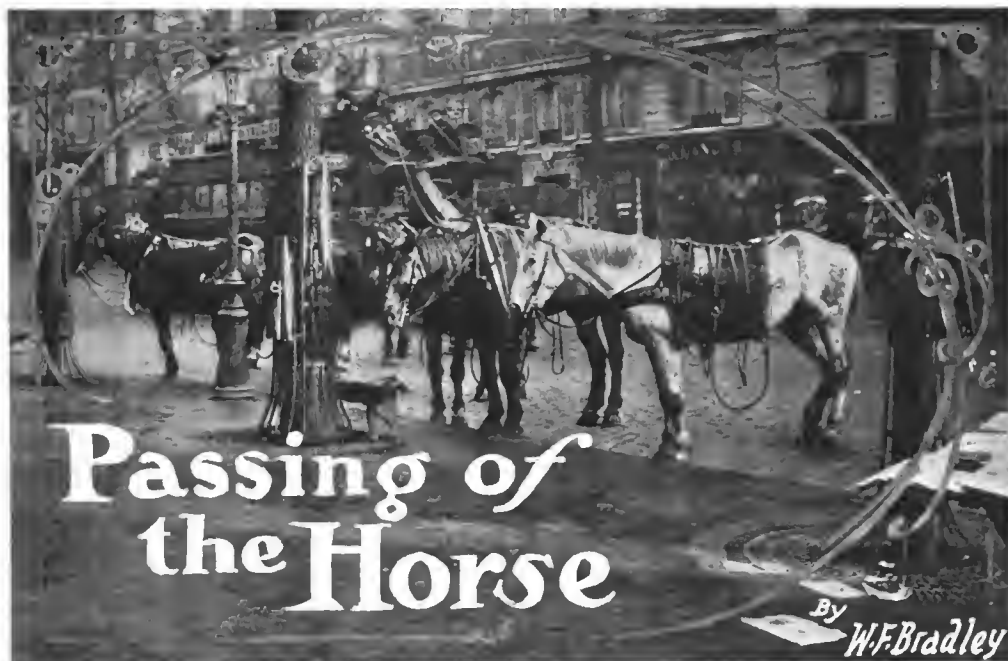
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The National Oil Pump & Tank Co.

DAYTON, OHIO



THE AUTOMOBILE



COCOTTE is dying. Perhaps you have never heard of Cocotte and have no tears to shed or any tender feelings of sympathy which swell up in your breast on the news of her approaching demise. Or maybe you are one of those who met Cocotte in the bone—for she never had much flesh—and wrote indignant letters to the *Paris Herald* denouncing her heavy-handed taskmaster and received as sole reply to your wrathful epistle an intimation from some fire-eating Parisian that if there were whipped cab horses in Paris there were also lynched negroes in America. In either case you are not likely to be moved by the momentous announcement, "Cocotte is dying."

The Dumb Tragedy of the Paris Cab Horse.

Cocotte is important numerically, for does she not represent at least 30,000 of the hippomobile population of the world's automobile capital? She came from nobody knows where; she showed a little spirit on the wilds of the fortifications as she dragged a frame on wheels and a couple of men along at a rapid clip. She bolted twice, perhaps thrice, when the sights of the gay capital were new to her and cab shafts were a novelty. But for five years she jogged along at a leisurely pace, indifferent whether her load were a consignment of market produce or an operatic star and her elegant admirer. Finally, worn out with wanderings, beatings and scant oats, she went—well, we had better not ask where she went. The question might revive memories of a windy city in the West.

The burly individual who had tickled her ribs through rain and sunshine was allotted another and younger animal, which was also christened Cocotte, and the cycle of operations recommenced. The lordly *cocher* came from wild Auvergne, generally. His utterance of *Fouchtre alors* would remove any doubt on that

point, even if his features and burly form allowed of the question. His costume was varied: a shiny white hat in summer; a shiny black one in winter. Carpet slippers in summer; wooden sabots in winter. A shirt, a coat, and pants in summer; the same, with the addition of innumerable coats, rugs, capes, and hoods in winter. A stout whip always.

The first signs of the coming revolution were visible three years ago, when an automobile gasoline cab made its appearance and, with the taximeter as a guarantee, offered to carry whoever cared to mount for the same minimum fare as the hippomobile. The distance was shorter, but that was a detail. A few months later 100 Renault cabs, two-cylinder engine, 8-10 horsepower, shaft drive, as the makers' description briefly

described them, were flitting all over the capital.

The real Parisian is not generally in a hurry and might not have deserted Cocotte and her mountaineer driver had there been no other inducement than a saving of time. To ride en auto was a big attraction, to ride en auto for about the same price as behind a horse was excellent; to ride en auto and see how much you owed as you traveled along and be able to dismiss your chauffeur when he became too costly, that was exquisite.

How a New Industry Sprang to Life.

The Renault Brothers were not allowed to long remain the sole furnishers of Paris auto cabs. In a few months, Panhard, Darracq, Bayard-Clément and a score of others were studying the details of a cheap vehicle which would run 365 days a year, could not be upset by a bungling driver and would never be seized with sudden and stupid immobility. Their efforts were successful, for, with mushroom growth, additions to the factories sprung up on a magnitude that indicated a desire to replace not only the Paris fleet of 10,000 horse cabs, but that of many a foreign city. At present there are five companies, the largest owning 1,000 cabs, the smallest 100, all in active operation in Paris. The passing of the horse, in this particular field, will



PLENTY OF TIME FOR REST.



The noted
Paris Cabby
is Losing
His Job

take about two years more, by which time there will be about 8,000 automobile cabs in the city and a handful of horse vehicles for timid maiden ladies who were once young.

Stroll along the Champs-Élysées, the Avenue du Bois, the main boulevards and other quarters where cab circulation is intense, and you will almost be persuaded that the mechanical has already surpassed the equine in numerical value. The horse cab has been driven to the railroad stations and the more distant stands, where waiting jobs mingle with paying ones. The auto cab sticks to fashionable main thoroughfares, and is rarely on the waiting list.

The Revolution of the 'Bus System.

Ever travel on a Paris horse 'bus? If you have not, and you are anxious to indulge in that leisurely recreation, you must not delay your visit to Europe, for the horse 'bus, like the cab, is passing and passing rapidly. Had not old Madame C. G. O. a monopoly on this class of transportation the change would have taken place a few years ago. But there was no necessity to move, and consequently no one did move until one day it was remembered that the old lady's lease of life would expire shortly. Then 40-horsepower automobile 'buses were ordered and placed in service from east to west, where they had to compete with the sub-



Ponderous
Autobuses
are Becoming
Numerous



way. Hilly Montmartre was next invaded, and the antiquated-looking individual who stood at the foot of the hill with the spare horse was put out of existence with one stroke. It was a sensation to the Parisian, used for long years to mount the steep grades at a snail's pace and occasionally get off to give a helping hand to the struggling beasts, to find themselves rushed up the slope at twelve miles an hour, with never a stop and never an encouraging shout or the crack of a whip.

In three years there will not be a horse-drawn 'bus in Paris. It requires no special wisdom to fix the date, for the present company's lease expires in 1910, and in June of that year 800 auto 'buses will replace the 700 horse vehicles, which, together with the hundred motor vehicles transport the traveling population of Paris. Darracq, the Napoleon of the motor world, is planning to control the 800 for a period of thirty-five years, and has already matured his plans for building, storing, and conducting his heavy brigade. The horse 'bus drivers have proved excellent chauffeurs. Some of them laid by the ribbons to take to the steering wheel with sore regret. You cannot drown the horse-love of a man in a day. But in a short time they were enthusiastic over their new charges and would not transfer to the old order, even if that were possible.

It is interesting to note that the first automobile 'buses to be used in Paris employ alcohol as a fuel. It does not appear, indeed, as if gasoline would have a chance to show its merits, for, if the Darracq-Serpollet Company obtains hold of the new lease, as is exceedingly probable, steam will be the successor. The present 'buses have four-cylinder engines, carried under the drivers' seat, ignition by high-tension magneto, and shaft drive through a special type of rear axle. The body is the one used on the horse vehicles with the addition of a permanent wood top. It is not likely that the company will convert its entire stock of vehicles, in view of the shortness of its life, but every month a certain number of horses are laid aside and mechanical power put in their place.

Passing from the Postal, Military and Municipal Service.

Electricity captivated the Paris postal authorities two or three years ago. The old way was to collect the mails from the numerous sub-offices by horse vans, which were generally sure, but never swift. The electric gave a quicker service and allowed the departure of mails to be fixed often two hours later than formerly. The horse is passing here, for a recent decree has gone forth that another big batch of horse-drawn vans must make way for the swift and silent electric.

Down on the riverside, just behind the police headquarters, where unfashionable Paris unites every morning bearing the goods found on land and water the previous night, is the horseless fire station. There is no shining harness, no well-groomed steeds, no newly laid straw and plaited mats. In their place are three automobile fire engines ready at the first turn of the crank to rush off to the accompaniment of a monotonous hoo-hoo-hoo which is the delight of the small boy and the joy of the idler.

Nobody knows Paris who has not wandered through its streets by night as well as by day. Have you ever got up at five o'clock, or stayed up until that hour, and meandered along the boulevards when they are in the possession of the man with the hose pipe, the newspaper delivery van and the scavenger teams? Under the old system the latter consists of a two-horse team, a couple of men, a loud-voiced youth with a whip, and a couple of women. It is difficult to understand why a woman should enlist in such an unsavory expedition. Perhaps the team is a family affair in which case the woman would be a necessity on the French principle that the woman must always be at the head of the family business. From 5 to 9 o'clock they make their round, seizing the garbage cans laid out for them, emptying the contents into their cart, the operation accompanied by much cracking of whip, shouting to the horse, to one another, and to any passerby who is talkatively inclined. When the horse falls, as often happens in winter, he is lashed until he gets up, or until his companion falls by his side, when with more shouting and cursing the two are

unharnessed and invited to rise to the accompaniment of more cracking of the whip and persuasive phrases. The new method consists of a huge automobile wagon which swiftly moves along, two men in the vehicle to receive the cans, two men on foot to throw them up. The work is carried on so quickly that there is no time for wayside conversation with belated cabbies or wearied policemen. Clatter, clatter, go the cans, as they are flung up and as quickly tossed down. Before the horse team has finished a block the motor wagon is half a mile down the street, and when a calculation of the amount of work done is made it is found that the auto scavenger has accomplished as much as five horse teams.

Street Cleaning Up to Date.

The horse is having to move out of the street cleaning department. Formerly a lean horse drew a revolving brush through the streets. The brush had to be kept at work during the day, when streets were crowded with quickly-moving traffic. The leisurely vehicle caused a block in the entire street, for the fastest vehicles, unable to pass round, had to accommodate their speed to his. This was especially the case in the fashionable Avenue du Bois de Boulogne, where the traffic consisted either of rapid automobiles or elegant driving teams. A machine had to be devised which could sweep and water the road without



For Street Cleaning the New Plan Excels



There's Much Time Saved in Post Collecting

garrison, near Paris, brought up thirty or forty automobiles of a very nondescript character to be passed in review by Captain Genty, better known to the automobile public as De la Touloubre, the Grand Prix race driver. Among the drivers of the machines was Edmond, of the Renault racing team.

Business houses, the large stores in particular, were the first to realize the benefit of the automobile, and there is not a store of importance that has not a large percentage of its delivery service performed by electric or gasoline vehicles. Among small firms the increase has lately been on a rapid scale.

Owing to the changed conditions, new street regulations have been applied to the traffic in the Champs-Elysées. Motor vehicles are confined to the center portion, horse vehicles have to keep to the sides, both in ascending and descending. An advantage for the automobile which had never previously attracted attention has been brought to light by this arrangement. The centre track, used exclusively by motor vehicles, is always clean; the two side tracks, used by horse vehicles, requires constant sweeping. Already the center track has become too crowded for the cars, and the Parisian is amusing himself by speculations as to how M. Lépine will regulate traffic when the horse has gone.

blocking the traffic. The outcome was the creation of a special type of automobile street sweeper and water wagon.

The horse-drawn surface car, like the horse 'bus, is but the child of a monopoly. He has not yet entirely passed off the stage of busy every-day life, but his passage is so far advanced that it may be considered as an accomplished fact. Electric surface cars, steam cars, and finally the rapid automobile 'bus, have made him appear as antiquated as the dodo. In a few of the quiet quarters, which the globe-trotter never visits in his busy haste, the horse-drawn species draws to a close its long easy-going career. Nobody protests against the slow service, for all know that the horse is passing, and the Parisian has a heart for the antique.

Gasoline has entered the army. This is probably its greatest victory, for the military authorities are always the most conservative and are never known to take to a new idea until it has been thoroughly tried by private enterprise. Now, instead of conveying sick soldiers from the barracks to the hospital by horses, they are transported in rapid Panhard automobiles with bodies specially constructed for this work. Every private vehicle owes a certain amount of service to the army, and as horse vehicles are being replaced by mechanically-driven conveyances, the number of automobiles presenting themselves for service with the troops grows larger every year. A recent inspection at the Vincennes



Removing the Refuse from the Streets

SOME REMEDIES FOR ROADSIDE TROUBLES

By THE MAN AT THE WHEEL.

"LET me tell you, not to overlook a spare valve when you're on tour," interjected one of the group of chauffeurs who up to that time had been a silent listener to the conversation regarding emergency repairs and the value of spare parts. "Of course, there's not one chance in a good many that it will be needed, but that's the one you carry it for, and it doesn't take up much room. Last summer, we were on a long trip and one fine afternoon when we were many miles from nowhere, one of the exhaust valve stems broke clean in two where it was drilled to retain the spring. The governor, he was riled at the idea of being hung up somewhere to wait for a new one. What he doesn't know about a car would fill a library, but he thinks I could build one with a hammer and a jackknife, so he says to me: 'Of course, you can fix that easy enough, Jack.' I wasn't so sure of it myself, but I took both valves out of that cylinder—the fourth—plugged the intake with a piece of waste, and we drove on three. The boss didn't seem to notice the difference and thought I had fixed things already; he was telling the women folks what a fine, clever lad I was. I wasn't saying anything, just thinking hard, for I knew we had some stiff work ahead and there'd be trouble with only three cylinders working.

"I thought and thought, and decided it was a new valve or nothing half a dozen times over, and every time the question would come back, 'Where are you going to get it?' We made a small town early and decided to put up there, which favored me. As soon as I could make it, I hiked to the blacksmith shop to see what could be done. 'Weld it,' says the man with the leather apron right off. But it didn't appeal to me at all; it meant three or four hours work drilling it and getting it back to the right length again with a file, and I knew the governor wanted to get away bright and early next day, so I said nay—a blacksmith's weld is not always a thing of beauty and I didn't feel just like spending half the night tinkering. He gave me up as a bad job and had no further suggestions, so I nosed around, still thinking hard. I found some odd pieces of stiff brass tubing lying around the bench and had an inspiration—some of it was just the size to slip over the valve stem with a good fit. The tinker had a good set of taps and dies and the rest was easy. I threaded the broken ends of the stem and tapped the tube, screwed the whole business together and drilled it for the spring end. It worked like a charm."

Stopping as a Symptom of Trouble.

"There are lots of rules and regulations handed out by the motor-wise on how to tell when there is something wrong with the engine; some of them are good, some bad, and more of them are hard for a new hand to remember," I overheard an experienced chauffeur telling some of his friends recently. "You can be dead certain that there's something wrong when she stops," he went on, "but there's a whole lot in noticing just how she died, and when you get wise to it, you'll wonder why you didn't think of it before. I make it a rule to always take it into account and it's a practice that has saved me lots of time on the road. If the engine shuts right off without any warning whatever, you can make up your mind right then and there that it's ignition trouble pure and simple—something has happened to cut off the 'juice.' Ninety-nine cases out of a hundred you'll find it's either a loose connection or a broken wire, and it's certainly wonderful how some connections will work loose no matter how carefully you tighten them up with the pliers.

"But when the engine begins to slow down and then pick up again and slow down some more, repeating that performance and running in starts and jerks, you have your choice of a weak battery or a partly plugged-up carbureter nozzle—of course, you have to take other things about the car into consideration in trying to make up your mind what the trouble happens to be; if

you know the accumulators haven't been recharged for a month or two past, there's little use of blaming the carbureter. But sometimes a dying battery will make the engine slow down gradually until she stops just about the same as the gasoline giving out will, though more often than not she'll turn up fine on what's left in the carbureter and then peter out within a minute or two as the last drop is used up. Fitful running, whether it ends up with a stop or not, usually means carbureter or fuel trouble somewhere along the line. There's a good deal to be learned about taking care of a motor that isn't in the books, and watching how she comes to a stop is one of them that you can only learn by experience."

To Prevent the Trembler Blade Sticking.

Correct adjustment of the coil tremblers is out of the question after the platinum points become pitted owing to the irregularity of the surfaces left by the action of the current. If badly eaten away, as is apt to be the case after long service, the only remedy is a complete renewal, but if the trouble be still in its earliest stages, trueing up will usually suffice. Starting with the points in good condition, it will be found that trouble from this source can be avoided to a very great extent by reversing the direction of the primary current at stated intervals, and autoists are coming to realize the benefit arising from this expedient more and more. This arises from the fact that the electrolytic action is always in the direction of current flow, the positive electrode or terminal being disintegrated by the passage of the current and a perceptible amount of the fused metal in a very finely divided state being deposited on the other terminal. Where the contact point on the trembler blade forms the positive terminal, finely divided platinum tends to deposit on the stationary or bridge point and vice versa, so that it will be evident that a reversal of the current flow will likewise reverse this action and to a large extent prevent the trouble that otherwise will arise from it sooner or later.

Carrying Accumulators on the Car.

While there is usually nothing fragile about an accumulator and its component parts are not over easily broken, it will be found a wise precaution to carry it on the car as if such were the case. It should not be rigidly fastened to any part of the car, but rather should be packed with some springy, yielding material that will absorb the greater part of the shocks due to jolting over the road, as well as the more or less constant vibration to which it is subjected. The reason for this does not arise from any motive of cleanliness, as the matter of spilling electrolyte is taken care of in the majority of cases by patented devices which permit the escape of the hydrogen, but prevent the acid from being shaken out through the vent. The greatest danger arises from the possibility of loosening the active material from the plates. True, this is forced into lockpockets under great pressure, but it must at the same time be porous in order to be efficient, and in trying to attain both extremes, the maker has to halt at some middle ground. It is safe to say that there is no accumulator made the plates of which will not suffer to a greater or less extent from being subjected to a constant pounding and shaking about. When sufficient of the active material has been loosened and fallen to the bottom of the cell to reach to the bottoms of the plates, the cell will be short-circuited and put out of action. It seems rather superfluous to add that in addition to the precaution of thus carrying the accumulator, no loose tools or pieces of metal should be permitted in the same case with it, but investigation of any number of cars sometimes reveals startling conditions in this as well as other respects. Some makers guarantee that their cells will not be injured by being placed on a dead short-circuit, but even accepting this at its face value, it will be found better to exclude screwdrivers and loose metal from the battery box.



BETWEEN New York and Boston there is some 250 miles of road which alternates from good to bad and bad to good with annoying frequency. Sometimes it becomes very bad; torn up by trolley-line builders or for the purposes of sewers and other street work. If there were a highway for automobiles—and one will be built in the not distant future—one could travel from Madison Square to the Common at speed equal to that of the "Mayflower Limited," and more healthfully and enjoyably, and at a schedule of your own choosing.

'Tis not so very long ago that the Automobile Club of America promoted an endurance run between the two towns and allowed three days for the journey each way. Searchlights which showed the road ahead in reassuring manner had yet to reach general use, and so there were night stops at New Haven and Springfield. That run supplied evidence that much harder tasks did not feaze the improving auto, which was rapidly making apparent its worth under conditions far from favorable.

There were four of us: Robbins, who drove; Van Cleve, whose long suit is publicity; Curry, who dips his pen in vitriol on occasion, and this editor, who blue-pencils more than he writes. Advocates of air-cooling have neglected the non-stop idea, and Robbins wanted to do a stunt of this sort with an Aerocar of this type, though it might be parenthetically injected that the same concern markets a water-cooled model. It follows naturally when one wants to avoid undue risk of stopping the engine that he drives with a greater caution than is the case when speed is the prime requisite.

A few straggling, late, home-going citizens curiously watched the flashlighting of the car and its quartette of occupants, taken at the corner of Broadway and Seventy-third street, and at 1:15 A.M. we turned northward, thoroughly awake and aware that a cheerless dawn was to be found somewhere in Connecticut. As we crossed the tracks of Amsterdam avenue at 110th street an inner tube gave up its life. It was a poor beginning. Again on our way, we were soon across Central bridge and rolling out Jerome avenue. Unannoyed by the overzealous "bike cop," we shortly struck the "Shore Road" and felt that the journey was actually begun.

Two black cats scurried across the road, and there was doubt expressed as to luck coming in the wake of such a pair. Humming musically, the motor dispelled any haunting fears, and we flew along, subdued by the raw night air, but inwardly confident of the ability of the pilot and his craft. New Rochelle, peacefully sleeping; Larchmont, sloping down to the Sound; aristocratic Mamaroneck and Rye—these fell to the rear. The milkman was

pursuing his early rounds as we sped through Port Chester, and policemen, wide-awake and watchful, were in plain sight.

A couple of miles more and we bade good-bye to the Empire State and entered the domain of the "Nutmeggers." Through Greenwich we caught a weird and ghostlike impression of the Soldiers' monument in front of the large stone church. Down "Put's Hill"—the one of the stone steps and scene of General Putnam's escape from the "Redcoats"—we went at a clip none too careful. Mianus, Stamford, Darien (where traps grow with suddenness in springtime), Norwalk, and Southport—all looked familiar in the coming of the cold, gray dawn. Someone tried a joke about something or other, but only the alleged humorist laughed after the telling. One doesn't indulge in plenteous laughter at break-o'-day traveling the open road on a sunless morn of a backward spring. I must ask Van Cleve to try his funny story under more propitious circumstances.

But the truth must be told. Robbins was having some trouble with the engine. It was baffling; the throttle acted contrary—advanced, it refused to give additional compression pressure and obstinately stuck. After the non-plussed operator had allowed his motor to come to a painful halt, and all of us had indulged in a few choice expletives, it was discovered that a measley little set screw holding the lever had become loose.

Before was Bridgeport; we had covered fifty-eight miles, and it was 5 o'clock. Yes, we would breakfast at New Haven, and then hold a council of war with full stomachs. Humanity was getting up now, and the road that led to Yale Common gained in activity as we neared the town of the classic elms. Though the New Haven House couldn't supply the finnan haddie for which Robbins craved, the breakfast left us in a more optimistic mood. The vote to continue and try for a one-stop score was unanimous. We had come eighty miles; Hartford was straight ahead forty-two miles; Boston lay some 124 miles beyond Connecticut's capital. Over an hour had been taken for the leisurely eating of the first meal of the day, and the hands of the clock pointed at 8:10 as we turned out Temple street.

Wallingford streets were filled with loitering schoolboys, reluctantly responding to the call of the imperative bell that meant an innings of instruction. Meriden was energetically at work as Robbins carefully steered through its busy thoroughfares, considerate of other users of the road, and making speed only when traffic conditions

made it safely possible. If all drove the way Robbins did during that long day there would be slight and then unfair antagonism from those who divide the road with the autoists. Frightened horses during the entire trip could be counted upon a single hand, and none of these were much more than merely excited.



CROSSING THE CONNECTICUT.



ONLY A STOP FOR A NEW ENGLAND SNAPSHOT.

Old Sol poked through the clouds as we entered New Britain, the home of the air-cooled Corbin. A practical sight met our eyes and reminded us that the thrifty New England housewife was at her spring cleaning. The engine of a Ford runabout, located in front of a spacious mansion, was supplying the power for a vacuum cleaner.

Hartford looked picturesque as we neared, the Glastenbury Range contributing to the inviting scene. Following the trolleys into Farmington avenue, we passed the house in the building of which Mark Twain placed the kitchen so that it looks out upon the avenue. His explanation was that it would save time for his servants in giving them constant opportunity of seeing all that was going on. Then it would be unnecessary for them to go through the entire house and peek through the blinds.

Emerging from Hartford, we were soon in sight of the placid and broad Connecticut, majestically winding its way to the sea. At Windsor Locks we crossed the river, and that which one sees from here to Springfield is typically colonial and restful, far from the madding throng. A stretch of sandy road gives your motor something to do, but ours was on its good behavior, and it never uttered a protest, as if anxious to make amends for the stop before Bridgeport, for which it was not to blame.

It is certainly beautiful country between Springfield and Worcester. Palmer was our lunching place, and we wasted the greater part of an hour. Sure enough, going through Leicester, there stood the famous auto deputies, watches in hand, and spectators on both sides of the street grinning unmistakably to see if we were to be victims of the limbs of the law. No, we were "wise," and crawled through the trap at a funeral pace. "Jim" Quinn was not on duty, and so we slid down into Worcester without a sight of that worthy.

Roads of the real kind carried us along at a pleasing clip. 'Twas 3:30 as we scurried through Marlboro, and once more we saw the schoolboy, and this time he was gleefully escaping from the house of learning. There was no call for us at the "Wayside Inn" in South Sudbury, but Curry reminded us that it was the old hostelry made famous by Hawthorne in his "Tales of a Wayside Inn." The A. C. A. signs were mighty helpful in going through Waltham and finally reaching the beginning of Boston's great park system, superior to anything possessed by any other city. Exactly 5 o'clock on the hour was the time of our arrival in front of "Pop" Lowe's in Tremont street, and, of course, he and a contingent of newspapermen were there to say "Hello!" Our net time for the run was about twelve hours, and in refreshment for men and machine and the tire and single stop incident three hours thirty minutes had been consumed. Nothing startling! No, nothing startling, except to demonstrate how the Boston-New York trip can be done without undue exertion in much less than a day where once the daylight of three days were thought necessary. And over that autoway of the near future the jaunt will be one of less than five hours.

* * * *

It bore the appearance of rain on Wednesday morning, and Curry and I took train back to New York. Not so with Robbins and Van Cleve. They wanted to have another, and the pilot hungered to do the job without a stop of the engine. Starting Thursday at 9 A.M., and blessed with daylight until Larchmont was reached, the air-cooler reported at Broadway and Seventy-third street at 8:23 P.M. This meant a total time of 11 hours 23 minutes, and the net figures were 9 hours 23 minutes. It ought to be mentioned that this Model D was the same one which ploughed over the snow and mud-soaked roads between the two cities in March last at the time of the Boston Show.

The use of special steels for rivets was the subject of a communication to the Paris Academy of Sciences lately by M. G. Charpy. A systematic study of the thermal and mechanical properties of various alloys of steel has led to the use of a chrome nickel steel for rivets, the strength of which is 2.5 times that of the metal usually employed for this purpose, and this without the need of any special precautions in practical use.

THE AUTOMOBILE CALENDAR. AMERICAN.

Shows and Meetings.

- May 28-31.....—Indianapolis, Ind., Annual Meeting American Society of Mechanical Engineers.
Oct. 31-Nov. 7.....—New York City, Madison Square Garden, Eighth Annual Automobile Show, Association of Licensed Automobile Manufacturers.
Nov. 30-Dec. 7.....—Chicago, Coliseum and First Regt. Army, Eighth Annual National Automobile Show, National Association of Automobile Manufacturers.

Races, Hill-Climbs, etc.

- May 6-7.....—Harrisburg, Pa., Two-day Endurance Run, Motor Club of Harrisburg.
May 30.....—Philadelphia, Hill Climb, Monk's Hill, Quaker City Motor Club.
May 30.....—Chicago, Memorial Day Race Meet of the Chicago Motor Club.
May 30.....—Bridgeport, Conn., Hill Climb, Bridgeport Automobile Club.
May 30-June 1.....—Newark, N. J., Three-day Endurance Run of the New Jersey Automobile and Motor Club.
June 12.....—National Orphans' Day, instituted by the American Automobile Association.
June 19-22.....—New York City, Sealed Bonnet Contest, under the auspices of the Automobile Club of America.
June 20.....—Albany, N. Y., Annual Tour of the Albany Automobile Club; Route, via New York and Asbury Park, to Atlantic City.
July 10.....—Cleveland, O., Start of Fourth Annual Tour of the American Automobile Association, for the Glidden Trophy. Finishes in New York City on or about July 23.
Sept. 14.....—Albany, N. Y., Road Race under the auspices of the Albany Automobile Club.
Oct. 19.....—St. Louis, Mo., International Aerial Race of the Gordon Bennett Prize. Aero Club of America.

FOREIGN.

Shows.

- May 4-15.....—Madrid, Spain, Automobile Exhibition, Palace of Fine Arts, Royal Automobile Club of Madrid.
May 15-26.....—Zurich, Third Annual Swiss Automobile Show.
June 25-30.....—St. Petersburg, Russia, Automobile Show.
Nov. 12-Dec. 1.....—Paris, Exposition Decennale de l'Automobile, Grand Palais, Esplanade des Invalides, Automobile Club of France.

Races, Hill-Climbs, etc.

- May 15-31.....—Belgium, Industrial Vehicle Trials, Automobile Club du Nord.
May 18-21.....—Milan, Italy, Touring Club Trials.
May 22-25.....—Irish Automobile Club Reliability Trials.
May 24-27.....—Voiturette Contest, Automobile Club of Austria.
May 28.....—Isle of Man, Tourist Trophy Race, Automobile Club of Great Britain and Ireland.
May 30.....—Isle of Man, Heavy Touring Car Race, Automobile Club of Great Britain and Ireland.
June 3-12.....—Paris, Electric Vehicle Competition, Automobile Club of France.
June 3-12.....—Herkomer Cup, Automobile Club of Bavaria.
June 14.....—German Emperor's Cup, Taunus Circuit, Imperial Automobile Club.
June 20-22.....—American Gold Cup, Start from New York of European Tour for American Cars, Georges Dupuy, secretary, 1402 Broadway, New York City.
June 14-29.....—Scottish Reliability Trial, Scottish Automobile Club.
July 2.....—Grand Prix, Automobile Club of France.
July 14, 1908.....—Paris to London, Aerial Race.
July 15-18.....—Ostend Week, Record Trials, Automobile Club of Belgium.
July 21.....—Ardennes Circuit (Belgium).
July 31.....—Liederkerke Cup for Touring Cars, Ardennes Circuit, Belgium.
July 31-Aug. 8.....—Belgium Regularity Contest for Touring Cars, A. C. of Belgium.
August 1-7.....—Criterium of France, 1,750 Miles Touring Competition and 250-mile Race for the Press Cup, A. C. of France.
August 11-29.....—France, Coupe de Auvergne.
Sept. 1.....—Italy, Brescia Circuit, Florio Cup, A. C. of Italy.

FROM BOTH SIDES OF THE SELDEN PATENT FENCE

FROM A. L. A. M. PUBLICITY BUREAU

SELDEN ACTION AGAINST INFRINGERS.

The spirit of activity that has been noticeable at the offices of the Association of Licensed Automobile Manufacturers for the past few weeks, developed Friday in a manner that proves that the owners of the Selden patent are determined to bring the validity of this famous patent to an early decision. Suits were instituted against nine infringing manufacturers or their representatives who are located in New York. The action of the owners of the Selden patent in bringing these new suits caused considerable uneasiness on the part of the dealers or representatives of the infringing manufacturers, as in some cases they did not know to what extent the manufacturers would protect them in this matter.

It had been understood for some time that the so-called test case against the Ford Motor Company, as manufacturer; John Wanamaker, as dealer, and O. J. Gude, as user, would be the only suit against the manufacturers of automobiles, not licensed under the Selden patent, so that these new actions caused no little surprise and consternation among the local automobile fraternity. Papers were served on the dealers or manufacturers of the following unlicensed cars: Maxwell, Mitchell, Aerocar, Rambler, Rainier, Premier, Marmon, Stoddard-Dayton and National.

Why so many suits should be brought at this time was the cause of much speculation, but it has been learned there were various causes; among others, it appears that the bringing of the large number of suits before the decision of the so-called test cases is frequently resorted to in order that such suits may be in condition for prompt action immediately upon the entering of the main decree sustaining the patent.

At the same time, it would seem as if the principal cause was the attempt of some infringers to leave the Federal jurisdiction in which the main suits under the Selden patent were being prosecuted. In this connection, for several months past it has been known that an unlicensed manufacturer near New York City had purchased a factory site in the West, and would, as soon as possible, remove his entire plant. While this action was publicly attributed to his finding better factory facilities in the West, and also better labor conditions, as well as several other excuses, it is understood now that those in his confidence learned from the manufacturer in question that the main object was to leave the jurisdiction of the Federal Circuit Court in which he believed there would be, at an early date, a favorable decision under the Selden patent.

It appears also that in the last few months there has been a considerable reduction in the number of direct representatives of unlicensed automobiles, and that on the other hand the unlicensed cars still being handled in New York have been sold by individuals or companies organized solely for selling, with no legal connection with the factory as exists in other cases where branch houses are established.

The bringing of many suits under the Selden patent, it is said, will enable the owners of those rights to take summary action immediately after the filing of the decision sustaining the patent in the so-called test case. On the other hand, it is also stated that unlicensed dealers have been persuading the buying public that they need not respect the Selden patent, and, in fact, it is frankly stated that there appears to be so much ignorance on the part of infringers whether manufacturers, or users, that the only safe course was found to be in the serving of papers to impress upon the unlicensed dealers and manufacturers the proper realization of their unlawful business. It is calculated the bringing of these suits, among other things, will stop misinformed

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FROM FORD MOTOR CO. PRESS BUREAU.

WHAT HENRY FORD HAS TO SAY IN REPLY.

Henry Ford, president of the Ford Motor Company, which has been fighting the alleged Selden patent for the past four years, was interviewed over the long-distance 'phone Saturday on the move. He was at the factory in Detroit. Among other things, Mr. Ford said:

"The press notice that the Association of Licensed Automobile Manufacturers has undertaken to sue some more manufacturers, is a fitting climax to some of their other childlike acts during the past few months. Driven to desperation by the unexpected developments and the exposure of their weak structure, nothing else was to be expected but a move of this kind. When nothing substantial can be shown, the officers of the A. L. A. M. seem ever ready to start suits against some small dealer. It is a pitiable state of affairs and shows that the predictions of the Licensed Association going to smash within the next few months seems likely to prove true.

"The ingeniously built structure that proposed to have a monopoly of motor car manufacture and boost prices accordingly, is nearing its end. The promised monopoly has failed to materialize, some eighty good manufacturers declining to pay royalty, while only thirty-two continue to give up money, although I understand many of these have stopped payments recently. Trust methods have failed to produce results, as the Association was too weak.

"Many things have occurred recently to make this latest move an expected one. Instead of continuing to fight with the Ford Company on which they started, they now try to annoy some New York dealers who happen to handle cars not made by their members. I notice that they didn't talk of serving the big manufacturers themselves. Even in New York, they don't go near the American Locomotive Company, for they look too big.

"I take it that the Licensed Association did not relish the exposure at the trial of the Searchmont Company against them which showed the tremendous sums paid in royalties, of which almost half, amounting to \$228,342, went to the lawyers. It was a soft pension fund for gentlemen like Messrs. Cuntz, Reading, Betts, and other attorneys and friends of the Electric Vehicle Company, which gets three-fifths of the royalties free and clear, and of which George H. Day, the former manager of the Association and the man who conceived it, was president. I understand, however, that Mr. Day has not been interested in the Electric Vehicle Company since the Licensed Association was formed.

"Other matters that have hurt the Licensed Association recently, was the exposure of the salaries and other expenses, amounting to \$223,902; the \$25 a day given to everyone who attends the frequent meetings held of the dozen committees; the fact that the much vaunted laboratory consists of a corner of Mr. Souther's laboratory in Hartford, for which a thousand dollars a year is paid, as Mr. Cutler testified. The movement of the twenty-five or more independent importers to organize against the seven or eight in the licensed association, didn't create the best of feeling among the latter, especially when it was known that they were trying to supply the importers with a date for their show during the holidays, which it is well known is the poorest time of the year. The officers undoubtedly feel that their own importers would quit and that the constant turmoil in which their present members move, would bring an outburst.

"I don't suppose the members who have been giving up good money like to be tricked by Mr. Selden himself, who bought the Buffalo Gasolene Motor Company in order to secure a license when one was refused him. Then the refusal of some of the

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(Continued from first column, page 735)

automobile buyers from believing themselves safe in buying unlicensed gasoline automobiles. It is pointed out that there is a penalty for infringement of the Selden patent as well as every other patent, not alone by the manufacturers of an infringing article, but likewise for the sale of the article and the use, as in the case of owning and operating an automobile. While the hardest fought suits are now generally understood to be pending against manufacturers, the suits just brought are directed against a large number of agents or dealers and it is understood that the other thirty suits have been brought against individuals owning unlicensed cars. This would seem to indicate the general program to stamp out, root and branch, the manufacture and traffic of unlicensed cars infringing the exclusive rights granted by the United States Government when the pioneer Selden patent was issued.

FROM A. L. A. M. PUBLICITY BUREAU, APRIL 29.

SELDENITES BRING SIX MORE SUITS.

Following up the nine suits against the manufacture or sale of unlicensed cars comes the report that actions against six other unlicensed concerns were begun. Suits were filed and papers served against dealers in, and the manufacture of the following unlicensed cars: American Mors, DeLuxe, Wayne, Glide, Dragon and Welch.

The activity of the owners of the basic patent which covers broadly the manufacture, sale or use of gasoline automobiles, has come to many as a great surprise, especially to dealers or representatives of the manufacturers of the nine unlicensed cars which were sued yesterday. To some of these it did not appear that any importance was attached to the proceedings, as their manufacturers would undoubtedly assume the responsibility, the dealers not realizing the liability they were assuming, and the penalty attached to the handling of an article that was an infringement. In this connection, from the decisions of the United States Court, in similar actions, it is manifest that the rights granted a patentee must be respected, and the overstepping of these rights are attended not only in awarding damages to the owners of the patent, but also all profits made in the traffic in an unlicensed car.

Referring to the Much Discussed De Feher Case.

The case in the Selden patent, known as the De Feher case, at the time of the granting of the decree and injunction attracted considerable attention. An attempt, however, was made to depreciate its significance, owing to the defendant's lack of contention, but Judge Holland's decree made it clear that the defendant had infringed, and awarded the owners of the Selden patent, not alone damages, but costs and profits, with interest on same, and a perpetual injunction restraining the defendant from the further traffic in the unlicensed product.

The prosecution of the suits that have just been brought will be pushed as speedily as consistent with the thorough preparation of the cases.

It has been pointed out that the cars whose representatives have been sued, with one exception, have been in existence only during the past few years, and that they did not market any product until after the formation of the Association of Licensed Automobile Manufacturers in 1903. A person associated with some of the automobile manufacturers for more than twelve years has even gone so far as to say that, with one or possibly two exceptions, the companies that have been sued came into the field when standards of construction had already been established by practically all of the manufacturers now comprising the Association of Licensed Automobile Manufacturers.

Any impression that the owners of the Selden patent would not endeavor to prosecute all infringers independent of the test case against the Ford Motor Company will be dispelled by the activity which is being shown.

(Continued from second column, page 735)

importers to pay royalties, the status of the Thomas '40' factory and the new factory for Buick runabouts, were among other things that are making the Association the laughing stock of the automobile and business world.

"Led on to an early show by the action of the Automobile Club of America and the American Motor Car Manufacturers' Association, they have got their date too early. The internal trouble undoubtedly resulted in the resignation of Mr. Day, a gentleman for whom personally I have the greatest respect.

"It is worth noting, too, that the independent organization, the American Motor Car Manufacturers' Association, of which we are proud to be a member, has doubled its strength during the last year, now numbering forty-two American concerns, or ten more than the licensed folks, and moreover, these makers are doing the greatest business, for they sell their goods at proper prices; are not induced to boost it to an abnormal figure in order to pay royalty, and consequently are patronized by the public. The so-called licensed folks have only secured two new members in a year, notwithstanding some extraordinary soliciting. So far as the alleged Selden patent is concerned, even their own members look upon it as a joke. Issued fifteen years after the original application was filed, it has never been considered seriously except as a foundation to keep the field of motor car manufacture in the hands of a limited few.

"Once upon a time a few people considered it as a serious thing, but of late it has been a huge joke among automobilists generally.

"It is a pity that even so desperate a combination as the licensed association should stoop to methods of this sort, but I presume it is a case of life or death. They will doubtless hold off a decision as long as possible, for on a decision they have everything to lose and nothing to gain.

"Some of the reasons given in the press notices sent out by the licensed association for this action against a number of manufacturers, are humorous in the extreme."

ATTORNEY PARKER ON THE SITUATION.

When seen yesterday, R. A. Parker, counsel for the Ford Motor Company and for the Panhard Company, said with reference to the statement in question:

"The statement to which my attention is called, I assert is beyond doubt one issued to the newspapers directly from the officers of the Licensed Association, so-called, in which they seek to stamp and characterize their own actions and state their own motives as though such actions and motives had been described and characterized by an impartial observer.

"The motive for putting this matter of bringing further suits before the public in the manner in question is very clear. It is done simply as one of the last desperate moves in the great game of bluff that the officials of the Licensed Association have been playing for the last four years. We remind them of Lincoln's famous saying, 'You can fool some of the people all of the time; you may fool all of the people some of the time, but you can't fool all of the people all of the time.'

"The public may be sure there is a crisis pending in that association, or these new actions would not be brought, and especially that they would not be heralded under such false colors.

"To a person having inside information, it would be quite a natural supposition that the suits were brought for the express purpose of using up in attorney fees, etc., the surplus of some \$160,000 or so which the Searchmont suit disclosed was still on hand in the treasury of the association after the payment of upward of \$225,000 in legal expenses. As the Searchmont case was brought to secure a division of this surplus or of any surplus, it would be natural for some parties connected with the association to divert it in other directions and leave nothing to divide."

ALCOHOL AS A FUEL FOR THE AUTOMOBILE MOTOR*

By THOMAS L. WHITE.

IN considering the possibilities of alcohol as a fuel for automobile motors, it is impossible to avoid alluding, however briefly, to the economic conditions which must eventually determine its use as a fuel at all, and this independently of all technical considerations. Gasoline is the by-product of a geographically limited and monopolistically controlled industry, and there are reasons to believe that the available supply is more than mortgaged by a world-wide and growing demand.

Alcohol is, one might say, the product of the four seasons. It can be manufactured from any vegetable substance which contains sugar or some material like starch, which is easily convertible into sugar. As to available supply, it can be and will be produced in unlimited quantities at a steadily diminishing cost. From corn-cobs it has already been experimentally prepared at five cents a gallon, and there seems little reason to doubt that if the technical problems connected with its use can only be solved, and if, also, what is important at the present moment, its use can be reduced to current practice; if, in other words, some means can be devised of economically burning this fuel in the thousands of automobile motors in existence to-day, there is little doubt that the demand so created will be satisfactorily met, both as to quality, quantity and price.

Passing now to the question of denaturing, it is gratifying to see that Mr. Yerkes has yielded to the pressure brought to bear on him, and has reduced the quantity of added methylene from ten to two per cent. This, however, is only a step in the right direction. When the use of alcohol in motors becomes more general, I think that the motor industry will be entitled to demand the same special consideration in the matter of a suitable denaturant as is now accorded to the chloroform, vinegar, ether, and other industries where the selection of a denaturant suitable to the needs of the case is permitted. So far as the motor industry is concerned something like this is already in force in Germany and Austria, where motor alcohol is distinguished from domestic alcohol, that is, alcohol for general purposes of heat, light, and fuel. If I might make a suggestion, I think that the revenue would be sufficiently safeguarded if alcohol destined for use in motors was saturated with acetylene gas with possibly the addition of a little acetone to facilitate its solution.

Methylene as a denaturant has the one commanding advantage in the eyes of the revenue officials, that by no means known to science can it be separated from ethyl alcohol. In the motor, however, it is a disadvantage in every way. Its action is corrosive, its calorific value is low and it is costly. The less of it the better. If alcohol must be nasty, let it, at any rate, be cheap.

To come now to the main subject of this paper, namely, the use of alcohol in existing motors working with a compression of four to one, or thereabouts, whose r.p.m. rate is high; before going further it is as well to briefly review, even at the risk of being considered trite, the essential facts with which we have to deal. They are:

(1) Alcohol calls for six per cent. of its calorific value to completely evaporate it.

(2) With ordinary compression the inflammation rate of the motor alcohol is sluggish compared to gasoline.

(3) Alcohol containing ten per cent. of water is capable of very high compression (150 pounds upwards) without pre-ignition.

(4) Alcohol in the process of inflammation does not radiate heat so rapidly as gasoline.

(5) Expectation to the contrary, alcohol is most efficient as a fuel when the wall of the cylinder is maintained at a temperature of about 200° Fahr.

(6) When alcohol is used as a fuel the penalty of incomplete combustion is not merely loss of efficiency in the motor, but the

corrosion and destruction of valve seats and other exposed parts due to the production of acetic acid, formaldehyde, and other deleterious compounds.

It is a well-known fact that the efficiency of an Otto cycle is a function of the compression ratio. It follows that in motors specially constructed for alcohol we should expect a very high thermal efficiency, and this expectation is borne out in practice. With the Deutz motor using a nine to one compression a thermal efficiency of over thirty-one per cent. has been obtained, which shares with the Diesel the distinction of being the high-water mark of efficiency for explosion engines. In the case of the automobile motor, however, the problem is to accept the compression ratio as a datum and to seek efficiency in other directions. This essentially means that the use of alcohol under such conditions is a carburetion problem.

Speaking generally of alcohol motors, carburetion practice falls naturally into two divisions.

(1) Motors, like the Deutz, which have a high compression and in which the alcohol is simply sprayed into the ingoing air just as it enters the cylinder, the hot cylinder walls and the heat generated by compression being relied on to complete the evaporation.

(2) Motors, like the Dürr, in which the compression ratio is moderate, say six to one, and in which a superheated mixture of air and alcohol vapor is produced by exhaust-heated baffles situated in the carbureter itself.

In both cases the motor cannot be started by hand. In the first case, because the hand compression is not rapid enough to evaporate the atomized charge in the cylinder; in the second case, because there is a precipitation of the volatilized alcohol on the cold cylinder walls.

In efficiency tests these two types come out about level. Thus in the Dürr motor the perfect carburetion offsets the lower weight of the mixture and the lower compression ratio, while in the Deutz motor the thermal gain due to greater compression is qualified by the fact that the evaporation in the cylinder is never complete and consequently part of the fuel is wasted thermally by being burnt late in the stroke or not at all.

It is clear that in automobile practice we must seek something in the line of complete carburetion, even at the expense of reduced charge weight, so that in order to produce efficiency under existing conditions of motor construction we must aim at:—

(1) Perfect carburetion with the aid of the exhaust heat.

(2) The acceleration of the rate of inflammation in the cylinder.

(3) The maintenance of the cylinder walls at a temperature of about 200° Fahr.

Coming now to the actual phenomenon of combustion in the cylinder itself, it would seem that the slow inflammation rate of a mixture of alcohol vapor and air is a necessary corollary of the fact that such a mixture is susceptible of a high degree of compression without spontaneous ignition. It is, I think, now a recognized fact that when an inflammable mixture is ignited by a spark the propagation of the explosion is not due to direct consecutive ignition throughout the body of the gaseous mass, but to the successive compression to the self-ignition point of layers of gas immediately enclosing the inflamed nucleus at the moment considered. Now, if gasoline and air be ignited, the shell of gas surrounding the explosion focus has only to be compressed about five to one to spontaneously ignite throughout its extent. In the case of alcohol a much higher compression is necessary, so that the explosion acceleration is necessarily slower.

All commercial denatured alcohol contains ten per cent. of water, and the function of this water in the alcohol motor is practically an undetermined problem. There is reason to believe that the corrosive action so much complained of in alcohol motors is partly due to its presence, and it undoubtedly has something

* Paper read before the Society of Automobile Engineers.

to do with the high compression ratio. Of course, it is known that the presence of water in an inflammable mixture in a motor is not altogether a disadvantage. In the first place, combustion in the absolute absence of water is impossible. Thus phosphorus absolutely refuses to burn in pure oxygen. Then, again, we have the experiments of Banki and others, who have deliberately injected water into the cylinder during the compression stroke with a resulting increase of efficiency in the motor. I have not seen records of any experiments made with absolutely pure alcohol, but they would be decidedly interesting, if only as a guide. It is, however, generally believed that alcohol containing water is the better fuel.

In an address delivered last year, which is given *in extenso* in the *Scientific American*, Dugald Clerk showed that the development of the stationary motor shows a decrease of the heat loss into the water jacket and an increase of the heat loss into the exhaust. Indeed, what has been gained by the swings seems to have been lost on the roundabouts. Owing to its low radiative quality alcohol comes naturally into line with this tendency in modern practice. In fact, were it not for the necessity of maintaining a high cylinder wall temperature, the question of cooling an alcohol motor would be a simpler one than in the case of gasoline, as the actual amount of heat to be dealt with is less.

With regard to the chemical reactions which take place in an alcohol motor, there seems to be much doubt and much difference of opinion. As between French and German authorities there exists a sort of scientific Franco-German war. Thus, while on one hand we find Sorel, the French expert, attaching the greatest importance to the erosive effort of acetic acid formed by incomplete combustion, we have Fehrmann, the German expert, denying the existence of acetic acid altogether. Be this as it may, it seems to be a definitely ascertained fact that when the carburetion is incomplete, pitting of the inlet valve seat and the formation of an incrustation upon it result. As to what excess of air should be present seems largely to depend on the r.p.m. rate, and in this connection it should be remembered that the record efficiencies for the use of alcohol for motors have all been attained with a low r.p.m. rate, in some cases as low as 200.

One of the most mysterious phenomena of the explosion motor is heat suppression, or the addition of heat during the expansion stroke, so that the expansion curve remains above the adiabatic drawn between the same limits in spite of the fact that heat has been radiated all the time. This suppressed heat in the case of alcohol is, according to Sorel, greater than with a gas engine. So far as a comparison with gasoline is concerned, the advantage, judging from P. V. diagrams, appears to be slightly with alcohol.

It is now with some diffidence that I come to mention an attempted solution of the carburetion question due to Mr. Barker and myself. The two objects of our device are to carburete air with alcohol instantly and completely and to promote approximately instant inflammation at minimum compression in the motor. What we propose to do is to pass air containing partly atomized and partly vaporized alcohol through a layer of calcium carbide before such air enters the cylinder. A portion of the ten per cent. of water in the alcohol is taken up by the carbide and replaced by acetylene gas, and the heat of this reaction simultaneously vaporizes the alcohol. From the nature of its formation such a mixture of acetylene, alcohol vapor and air must necessarily be a very intimate one. In the cylinder we consequently have:—

(1) A well-diffused mixture.

(2) An endothermic compound in the form of acetylene, which contains heat over and above its thermal value and which spontaneously ignites at comparatively low pressures, so that when the mixture is fired the pressure set up round the spark plug causes the practically simultaneous detonation of the acetylene throughout the body of the alcohol.

Taking into consideration that the substitution of acetylene for water is a net gain calorifically, and that the elimination of this water will probably do away with much of the erosion complained of in alcohol motors, we hope to produce for the ordinary

automobile motor an alcohol-air-acetylene charge, whose characteristics thermally are not very different from those of a mixture of gasoline and air.

I had hoped to have had this apparatus running this week and to have been able to give actual figures of a trial run. There has, however, been some little delay in getting castings made, and although all the parts are now ready to be assembled and attached to De Dion motor coupled direct to a dynamo, we have not been able to get into running shape in time.

There is an impression in some quarters that alcohol has to some extent received a black eye in Europe. It would probably be more correct to say that, while with slow-going motors it has proved a great success, the development and perfection of the automobile motor have left little leisure to designers to study the alcohol problem with any thoroughness. In fact, it is more or less virgin forest, which the automobile engineer has to clear when he is dealing with the question of alcohol motors, and there is no reason whatever why America should not, with the resources which has been shown in other branches of engineering, lead the way. And if this happens, as I hope it will, the credit will be all the greater, for while in Europe gasoline is a heavily taxed import, in America it is an indigenous product.

ALCOHOL ENGINES IN SOUTH AFRICA.

According to the American Consul-General at Rio de Janeiro, the development of alcohol engines to take the place of engines in the United States as a result of the recent legislation for the use of denatured alcohol is watched with much interest in Brazil, says *Commercial Intelligence*. The manufacture of practical, simple and cheap alcohol motors similar to the motors now sold will, he thinks, meet a ready demand in Brazil. Gasoline is costly, and the difficulty of transporting it, passing it through the Customs, and caring for it afterwards, under very stringent regulations, has retarded the introduction of gasoline power in many lines. On the other hand, alcohol is cheap in Brazil, and most sugar-growing countries. Large quantities of it are exported, and immensely increased quantities could be made easily and cheaply, the present output being measured more by the demand for it than by the possibilities of production. The sugar alcohol in Brazil is used without any denaturing process. It comes in several grades, some of which are of too low degree to burn readily, but a demand for high-grade alcohol for power fuel or any similar purpose could and would be met quickly. Alcohol of export-grade has been shipped from Brazil in recent years at about 40 cents per gallon. The further development of the sugar industry, which is following increased demand for Brazilian sugar in Europe, will doubtless lead to the production of alcohol at a much lower cost. At present in Brazil it has few industrial uses.

HOW TO MAKE POLE-FINDING PAPER.

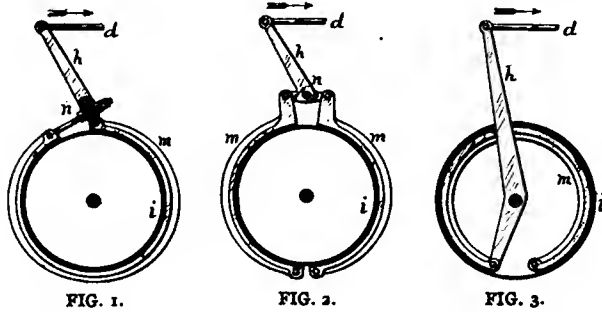
Pole-testing paper is a prepared paper which may be used for the finding of the negative and positive poles of an accumulator, says *Work*. One method of preparing it is as follows: Dissolve a teaspoonful of sodium sulphate in one-half pint of water, in which also dissolve about the same quantity of potassium iodide and of starch. To dissolve the starch the water must be heated. Soak white blotting paper in this solution, dry it, and cut into strips of any convenient size; 1-2 inch by 2 inches is suitable. Keep the paper in a dry place, such as a tin box or a glass bottle. To use, moisten a strip and place the two poles on it, near together or farther apart, according to the voltage of the current. A dark spot will appear at the positive pole. Another method is to dissolve 15 grains of phenol-phthalein in 1-2 ounce of common alcohol. Dissolve also 20 grains of sodium sulphate in four ounces of water. Soak blotting paper in the first solution and drain off the superfluous liquid. Then soak it in the second solution and dry it. Cut to size and use as before. A red spot appears at the negative pole.

BRAKES AND THEIR CARE AND REPAIR

By VICTOR LOUGHEED.

THERE is no part of an automobile ordinarily more neglected than the brakes. Despite their importance as a chief means of safeguarding the lives of the owner and his friends, for some reason there is a pronounced disregard of the elementary precautions necessary to insure their operative condition at all times. Cars otherwise excellently maintained often are seen with brakes in bad condition.

The reason for this slipshod attitude of so many drivers is not far to seek. Brakes are designed for two uses—one frequent but not exacting, the other of vital importance but of infrequent neces-



sity. This condition seems to inspire the average man with an inclination to gamble against the likelihood of his ever needing the brakes seriously, rather than with a disposition to depend upon their proper functioning.

The purpose of this article is to impress upon the reader the very great necessity for maintaining brakes in proper condition, while at the same time pointing out the principal essentials of such maintenance and condition. To this end it will be convenient first briefly to enumerate the more important types of brakes in common use, so that their normal condition may be at hand as an illustration of the points involved in maintenance, repair, and remodeling.

Kinds of Brakes.

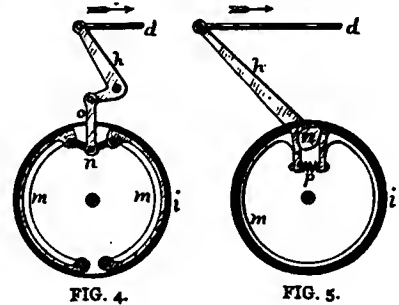
Constricting Brakes, or band brakes, are of the general type shown in Fig. 1, in which *i* is the brake drum, attached to one of the wheels, and *m* is band capable of being powerfully constricted around *i* by a pull upon the lever *h*, through means of the rod *d*. The band *m* is lined with some material which sets up a powerful friction when forced into contact with *i*. In Fig. 2 a constricting brake of slightly different type is used, the characteristic feature being the two shoes *m m*, in place of the band *m* in Fig. 1. These shoes are drawn together by the action of the toggle joint *n* when a pull on the rod *d* moves *h* in the direction of the arrow. Another type of constricting brake is that sketched in Fig. 6, in which the brake drum *i* is grooved and carries in the groove the helically coiled metal band *o*, which is held at one end by *w* and tightened by a pull on the other at *d*. Because the motion of the wheel *a* tends to wind the band tighter as it turns in the direction of the arrow, this type of brake gives an exceedingly powerful effect with a comparatively light tension, but a great objection to it is its poor holding quality when the wheel turns in the reverse of its normal rotation.

Expanding Brakes differ from constricting brakes in that the friction members are inside of the brake drum and come into action by expanding against it instead of being constricted upon it. Such a brake is shown in Fig. 3, in which the friction ring *m* is enlarged in diameter and thus forced into contact with the drum *i* when the lever *h* is moved by a pull upon the rod *h*. This brake is open to the same objection that applies to the constricting brake last mentioned, which is that it is single acting and therefore of somewhat problematical efficacy for stopping any rearward motion, especially in such a case as that of a car backing down

hill through injury to the propelling mechanism. The brake pictured in Fig. 4 is a double-acting expanding brake, so will hold against either forward or backward movement. Its principal operating members are the two shoes *m m*, spread apart by the toggle joint *n*, so it is in a manner analogous to the constricting brake shown in Fig. 2. A very satisfactory and much used type of expanding brake is illustrated in Fig. 4, in which the expanding ring *m* is applied to the drum *i* by a separation of the ends caused by the action of the cam *n*, operated by the lever *h* and the rod *d*.

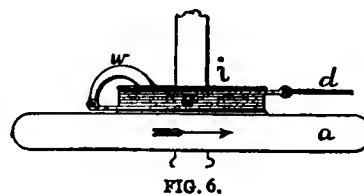
Disk Brakes are less common than disk clutches, but their very obvious superiority in a number of minor respects causes their occasional application to cars of proved quality. Fig. 7 shows a disk brake of a successful form, which differs little from the ordinary disk clutch. The hub drum *i* is formed with a series of grooves in the inner surface in which a series of steel rings are held by lugs projecting from the peripheries. Alternating with the steel rings is a series of bronze rings, similar, except that in their case the lugs engage with grooves formed in the inner drum *o*, which cannot rotate, though it is free to slide endwise on the axle. The spring *p* ordinarily holds the brake disengaged, but by pulling upon the wire *d* the bell crank *d* presses both series of disks into contact, and thus exerts a powerful retarding effect on the wheel.

Sprags of various sorts are much used to safeguard automobiles on hills. A sprag, in its simplest form, is simply a sharpened rod hinged to the underbody of the vehicle, so that when dropped it points rearward and digs into the road upon any rearward movement. More recently the ratchet sprag is coming into vogue. In this form it consists of a pawl acting on a ratchet affixed to the rear wheels or in some part of the transmission, so that the car cannot back unless the reverse is engaged.



Adjustment of Brakes.

Non-Compensated Brakes are on the order of the one sketched in Fig. 8, in which *i i* are the brake drums, within which the brakes are applied by movement of the levers *h h*. These in turn are pulled by the rods *d d*, which connect with the rod *c*, rocked by the brake lever *a*. It will be noticed that *d d* are



broken in the middle by turnbuckles by which they may be lengthened or shortened, so as to produce even application of both brakes. It is very important that this adjustment be correct, since if one of the rods is too short the application of the

brake with which it connects will prevent the application of the other. To get the adjustment right, it is sufficient to see that both rods are about equally tense when the brakes are lightly applied.

Compensated Brakes insure substantially equal braking on both wheels, regardless of the adjustments. A well-tried form is that shown in Fig. 9, in which the levers *h h* are both connected with *c* by a single wire cable which passes through the inside of *c* in such a manner that the tension upon it automatically keeps it shifted to an equilibrium of pull on both sides. Another compensated brake is shown in Fig. 10. In this the rods *d d* extend

only to the single tree *f*, which in turn is attached by the middle to *g*, connected with *c*. Obviously, the slight rock of *f* which will occur if *d d* are not the same length, will fully compensate the pull. The construction shown in Fig. 11 substitutes for the long

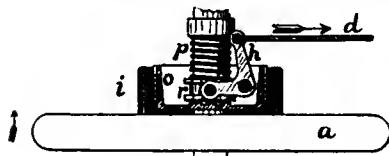


FIG. 7.

single tree of Fig. 10 a short one, at *f*, Fig. 11, which spans the two inner levers on the extra shaft *j j*. The action is similar to that of Fig. 10. It is not to be supposed that compensated brakes do not require adjustment. In common with brakes of all other types, it is exceedingly important that they be in such condition that they release freely and yet apply fully before the controlling lever or pedal reaches the limit of its movement. Many brakes violate the first of these conditions, and when they should be off, continue to drag on the drums, causing undue noise and wear. The spring *p*, Fig. 5, is a provision to insure quick release, and something of this sort is in almost every case desirable.

Friction Surface of Brakes are their most vital feature, for it is upon the quality and durability of these surfaces that the utility of a brake depends. Almost every conceivable material

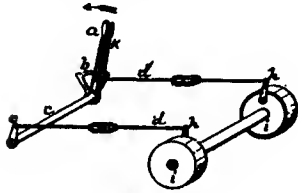


FIG. 8.

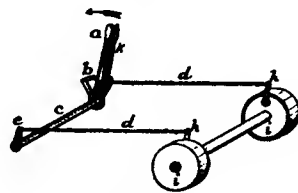


FIG. 9.

has been tried for this service, but the best results are secured only with a few. Brake drums are almost invariably made of steel, though cast iron is used to some extent. Bronze shoes work very well on steel drums and a lesser degree of success has attended the use of copper or brass blocks against steel. Bronze and steel are practically the only materials used in disk brakes. Leather forms a friction surface that applies smoothly and retards effectively, but it is less durable than vulcanized fiber or a widely-used prepared belting, known by the trade name of "camel's hair." Castiron-to-castiron or castiron-to-steel make excellent brake surfaces—much better than is commonly supposed. All brake surfaces are subject to wear and this wear is to be reckoned with rather than avoided. Its occurrence constitutes the chief necessity for occasional readjustment and regularly requires absolute replacement. Provision for such replacement is made in all good designs, and with any well-built car it is not

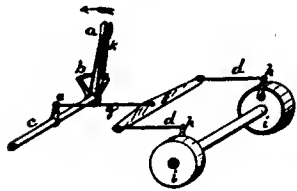


FIG. 10.

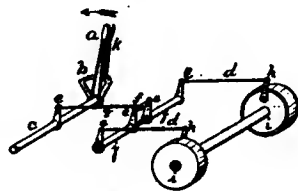


FIG. 11.

very difficult to remove the worn friction surfaces and replace them with new. Usually this will involve a readjustment of the other parts of the brakes to make the moment of application coincide with the proper position of the lever or pedal.

Overheating of Brakes is a common difficulty, especially in coasting down long hills. Some brakes are air-cooled by fans and fins cast in the hub drums; others are water-cooled by drip devices arranged to be turned on when occasion requires. It is quite impossible to secure a braking effect without the development of heat, so this phenomenon is to be reckoned with. With cars provided with more than one set of brakes, application of the two should be alternated during long coasting.

Placing and Protection of Brakes are important details. Most modern cars have several sets—at least one acting on the rear-wheel drums, one acting on the propeller shaft or counter-shaft, etc. Some of the most-approved designs have both brakes acting in separate annular parts of the rear-wheel drums, a construction that is as neat as it is effective. Internal-expanding brakes are perhaps the easiest to protect, their nature making easy a construction that excludes mud and dust. Disk brakes are similarly easy to protect. Constricting brakes usually are left to get dirty and are of such construction that a little dirt possibly improves rather than harms their quality.

Control of Brakes.

Automobile brakes control either by pedals or levers—the former being most favored for running brakes and the latter for emergencies. A forwardly-moving lever is shown in Figs. 8, 9, 10 and 11 of this article, it being arranged to lock in any position on the sector *h*, by the detent mechanism. Pedal brakes rarely are arranged to lock in the applied position, though the auxiliary latch pedal for this purpose has enough advantages to make its use a cardinal tenet with some advanced manufacturers.

Power Control of brakes is an alluring proposition, and there are several devices on the market for working brakes by compressed air, spent exhaust gases, etc.

It is a great mistake to stop a car so suddenly as to slide the wheels. A gradual retardation of the wheels' rotation not only saves tires and trouble; it actually stops a car more quickly.

Remodeling Brake Systems.

Remodeling brakes is not a difficult task for the amateur, and is excellent policy with a car the least out of date. As has been suggested herein, the changing from one type of brake to another, the provision of compensating means, the fitting of a ratchet or other sprag, the renewal of friction surfaces, the installation of a brake-cooling system, modification of the control, etc., are all or any likely to improve a car not already up to date in every particular.

INTERNAL COMBUSTION ENGINE FOR SHIPS.

Next to the steam turbine, the internal combustion engine is the most interesting feature at present in the field of marine engineering, says the annual report of the *Institution of Naval Architects*. Although no very remarkable developments have taken place since I last addressed you from this chair, the use of this type of engine for marine work in small craft of various kinds has continued to make good progress. Its popularity for pleasure boats and launches continues to spread, while for commercial purposes engines using heavy oils and running with great economy and regularity are now being turned out by a number of firms. In our submarines the gasoline engine continues to be used for surface propulsion, and one of last year's additions to our fleet of torpedo boats was an experimental one 60 feet long, built by Mr. Yarrow's firm at Poplar, and propelled by three sets of internal combustion engines, each driving its own screw. The speed of this boat was 25 1-2 knots, which was 5 1-2 knots faster than that which would have been reached had steam machinery been installed. It is not, however, to gasoline engines that we can look for the propelling machinery of vessels of any considerable tonnage, the costly nature of the fuel puts it out of the question; and, so far as we can see at present, ordinary kerosene stands only second in this category. The application of the suction gas producer to marine practice, however, affords hope of using our cheapest fuel, coal, without the intervention of the steam boiler. The elucidation of this problem is beset with difficulties, but many able minds are at work upon it; and after the start that has been made with the experimental boats, of which we heard some account last year, we may reasonably hope for further interesting developments in this field of enterprise at no distant date. Already we hear rumors of a suction producer and gas engine of power sufficient to propel a seagoing vessel of large size.

HORSEPOWER IN RELATION TO MOTOR DIMENSIONS*

By F. W. LANCHESTER.

THE foundation argument of the present paper is based on *Dimensional Theory*. It has for many years been a surprise to me how little the theory of dimensions is known, much less employed, by engineers, and if, in the present paper, I can bring it home to some few here that there is a valuable tool lying idle which is worthy of frequent employment, the time taken in the preliminary discussion of *method* will have been in no sense wasted. The past neglect of dimensional theory by the engineer seems all the more inexplicable when we remember how, in other matters, discovery and method are taken "red hot" from the physical laboratory and adapted post haste by the modern engineer to meet the insatiable demands of Western civilization.

The Theory of Dimensions.

The theory of dimensions may be said to be founded upon the very simple and obvious fact that a *time* can never be equal to a *volume* or *space*, or an *area* to a *linear* quantity, or generally one physical quantity to another involving different fundamental quantities. The question of what constitutes a *fundamental quantity* touches on the ultimate definition of our conceptions; but it is customary to recognize *three fundamental quantities*, and three only. These are: *Length*, *Mass* and *Time*, or, for short, L., M. and T., into which all other physical quantities can be resolved. The expression denoting the constitution of any derived quantity is said to give the *dimensions* of that quantity. Thus, velocity is a length divided by time and

has the dimensions $\frac{L}{T}$; *acceleration* is velocity generated per

unit time, or $\frac{V}{T}$, ultimately $\frac{L}{T^2}$, and so on.

It is a necessary property of all equations representing physical quantities that the *dimensions* of the two sides are in agreement. We often find an expression that apparently falsifies the above statement, but such expression or equation is always *incomplete*—there is something *left to be understood*, such as a physical quantity *included in a constant*. Thus, if I say that the acceleration produced on a motor vehicle is proportional to the force that produces it, I may write the statement in the form of an expression: $f=cF$, and where f is acceleration, F , force, etc., is a constant. Now this seems a perfectly clear statement properly expressed, but we have dimensionally:

$$\frac{L}{T^2} = \frac{ML}{T^2}$$

and the dimensions do not balance; *there is an M on the right-hand side and none on the left.*

Now, what does this M mean. It means that my equation is not complete. The acceleration is produced on a given motor vehicle. It is not *any* motor vehicle—a general expression that covers everything from an omnibus to a basket perambulator; it is a *particular* motor vehicle, and dimensional theory says: "I want to know *how much that vehicle weighs.*" You see it does not want to know the make of the tires or the cylinder measurements. It tells us precisely what is missing to make the expression complete; it wants to know the *mass*.

An engineer should acquaint himself with the *dimensions* of the physical quantities with which he has to deal, and should make a habit of checking his equations whenever in doubt. Mistakes may easily occur owing to the employment of an *incomplete* expression in cases where the *complete* expression is neces-

sary. The method of *dimensions* will unfaillingly point out a missing factor or a mistaken quantity, if such exist.

Similarity of Figure and Its Consequence.

Before proceeding to the main discussion, there is a further preliminary matter to which it is necessary to devote some attention, *i.e.*, the question of *geometrical similarity* in bodies of varying size.

Let us take for discussion the case of a rectangular brick. We know that the volume of such a body, taking volume as a quantity we wish to investigate, may be expressed as a function of its three linear measurements, no matter what the proportions or size of the brick may be. If we know these measurements we can at once calculate the volume.

Now, owing to the simplicity of form of a brick we lose sight of an important point. We can define a brick by three measurements, but we cannot so define the volume of an irregular form. There is, however, another way of expressing the volume of a brick; we might take any one measurement, l as representing the *size* of the brick, and a co-efficient c as proper to the shape, thus:

$$\text{Volume} = l^3 \times c.$$

Then the co-efficient depends upon the *shape* of the brick, and is constant for bricks of similar geometrical form.

We thus have the volume expressed as a *function* of the *linear size* and the *geometrical shape*, and in this form the expression is applicable to any and every form of body from an Atlantic liner to a vegetable marrow. Now, so long as c is constant, that is to say, so long as we are dealing with bodies of geometrically similar form, we know, without elaborate measurement, that the surfaces of the different bodies are in the relation of their values of l^2 because they are *surfaces*, and the dimensions of surface = L^2 ; likewise, we know that the volumes are as l^3 because they are *volumes*, and the dimensions of volume = L^3 .

Further, if the *distribution of matter* in the bodies is geometrically similar, that is to say, if the bodies are *homomorphous*, as when all are of the same density, or being of not uniform density are of like density in like parts; the masses will be in the proportion of $p \cdot l^3$ for density, (p) is of the di-

$$\text{mensions, } \frac{M}{L^3} \text{ and } \frac{M}{L^3} \times L^3 = M.$$

Thus, we know that if two machines, say motors, be built part for part alike, but differing in *scale*, their weights are as their respective *linear measurements cubed*. Now this is an ordinary everyday fact with which every engineer is acquainted, and may be looked upon as a mere matter of common sense, but, like many other matters of common sense, it is only one step removed from the abstruse.

Power as a Function of Linear Measurement.

The maximum power capacity of an engine is likewise a function of its geometrical form and its linear dimension. Taking as before geometrical form as constant, that is, assuming geometrical similarity, let us investigate *power* as a function of linear measurement, l . We know that one of the determining factors in the power developed by an engine is the revolution speed, and we must first prescribe the general conditions that determine the maximum revolutions at which an engine can be run. We know that, given adequate port areas, the limit of speed is determined as in structures of all kinds, by the *strength of materials*. We are not justified in stressing the material in one machine any higher than the similarly situated part in another; our limiting condition is therefore *stress*, $r = \text{constant}$. If we assume the same materials to be used in dif-

*Paper read before The Institution of Automobile Engineers, London.

ferent machines, we have p also constant. There is no need, however, to remove these factors from the equation; we might want to employ different materials having different strengths and densities. Let us take p , σ and l as the variables on which the h.p. depends and deduce the general expression.

We have—

$$\text{H.P.} = l^p \times \rho^q \times \sigma^r \times \text{constant},$$

or dimensionally,

$$\frac{ML^3}{T^3} = L^p \times \frac{M^q}{L^{3q}} \times \frac{M^r}{L^r T^{2r}}$$

Whence,

$$\begin{aligned} q+r &= 1 \\ 2r &= 3 \\ p-3q-r &= 2 \end{aligned}$$

from which we have:

$$\begin{aligned} r &= 1.5 \\ q &= -.5 \\ p &= 2 \end{aligned}$$

so that the full expression is:

$$\text{H.P.} = \frac{\sigma^{1.5}}{\rho^{.5}} l^2 \times \text{constant.} \tag{1}$$

We will proceed to discuss the consequences of this result.

Deductions from H.P. Equation for Similar Engines.

In the first place, we will suppose that the same material be used in different cases for like parts; we then have ρ and σ constant, and:

(a) The power varies simply as the *square of the linear dimension*. Such linear dimension may be the *stroke* or the *cylinder diameter* or any other datum, provided the same similarly situated measurement be taken in every case.

(b) If the basis of measurement be two linear measurements (such as bore and stroke), the rating measurement may be the simple product of such measurements or the *product of their fractional powers*, provided the *sum of their indices = 2*, that is to say, so that the product shall be of the *dimensions L²*. Thus, if D be the diameter and S the stroke, the rating measurement might be D.S or D^{1.5}.S^{.5} or D^{1.1}.S^{.9}, etc., or generally—Dⁿ.S²⁻ⁿ. (2)

Corollary, that for engines of other than similar geometrical proportions, the same law applies, the values of the respective indices being chosen according to principles not so far investigated, for we may regard the similarly proportioned engine as a special case to which the general law must conform.

(c) That the *weight per h.p.* of similarly-designed engines varies *inversely as the linear measurement*. A most important consequence, as pointing out the essential saving of weight resulting from small units and multi-cylinder engines. Example: A four-cylinder engine, with 5" X 5" cylinders is (fly-wheel apart) of but one-half the weight of a proportionately-designed single-cylinder engine of the same power, *i.e.*, one of 10" diameter and stroke.

(d) With certain reservations, that will be discussed later, no horsepower rating rule is defensible that does not conform to the L² law; that is to say, being based on linear quantities, the sum of the indices must equal 2.

Universal Character of the L². Law.

It is a remarkable fact that the h.p. varies, as L² law here deduced seems to be almost, if not quite, universal. Thus, the h.p. capacity of an animal, other things being equal, depends upon the oxygen supply, that is to say, it is proportional to the *area* of lung membrane, and in turn to the cross sectional *area* of the aorta, etc. Again, in the case of the railway locomotive, the limitations to the h.p. are, the grate *area*, the heating *surface*, the sectional *area* of the steam pipe, etc., etc. It is never a *volume*, as the *volume* of the fire-box, or the *volume* of the boiler.

At one time I was disposed to attribute this generalization M.L³
to the fact that the *dimensions of power* involve L³ thus, —; T³

but any such explanation is inadequate, for *energy* also involves the same linear power, and energy is always measured by the *mass*, or under certain restrictions the *volume* of the determining factor. Thus, the heat energy released by the combustion of a quantity of coal depends upon its *mass*, but the power developed is proportional to the rate of combustion, and so, other things being equal, to the total *surface* of the incandescent lumps of fuel.

It would seem probable that the considerations that apply in the case of a machine producing or transmitting mechanical energy, as herein demonstrated, where the conditions are regulated by the factors stress and density, also obtain over a much wider range of conditions, including the production or transference of energy in other forms, such as the production of heat by combustion; this aspect of the subject is outside the scope of the present paper.

To Include Changes of Geometrical Proportion.

The comparison of the power capacity of different engines, when the condition of similarity is infringed is, in reality, a highly complex problem, for the reason that we now have to deal with h.p. as a function of *geometrical form*, and the possible forms of change are multiplied infinitely. If the problem were presented in its widest mathematical sense, as supposing engines *proportioned by pure chance*, then the position might be considered hopeless. In reality, the issue is brought within very narrow limits by the assumption of a certain degree of skill on the part of the designer, and other considerations of a practical nature.

There are many factors that may independently limit the h.p. of an engine, on the principle that the strength of a chain is its weakest link. For example, a restricted port or valve area may limit the h.p. to vastly less than that legitimately due to the cylinder measurements. By common consent, it is agreed that the cylinder measurements form the most suitable basis for rating purposes. Whatever basis be chosen, we shall expect the *rating rule* to have some influence towards *distorting* the design as due to natural evolution; for instance, if we were to take the valve or port area as basis, the designer would be tempted to cut this down as much as possible, and a highly undesirable kind of *distortion* would come into vogue, resulting in great loss of efficiency. In choosing the cylinder measurements the tendency is in the opposite direction; *i.e.*, the ports are made as free as possible, which, inasmuch as it tends to efficiency, may be looked upon as a fault on the right side. It must be understood that there is no *strictly scientific* reason why the cylinder measurements alone should be taken as the basis, it is a matter of convenience or common sense; the tacit assumption is made that the other determining factors are so dealt with that their effect is negligible,—it is for the designer to see that this tacit assumption is complied with.

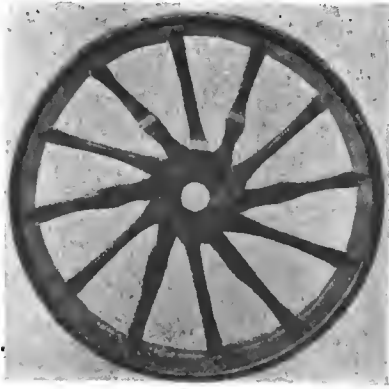
Having determined on cylinder measurement as a basis, it remains for us to investigate the conditions controlling the index values in the expression DⁿX S²⁻ⁿ, so that the designer, under the rating rule, cannot gain by adopting extreme proportions; that is to say, so that the rule adopted will not result in any distortion of the design in respect of the proportions of stroke to diameter.

(To be continued.)

The action of oils on vulcanized rubber is a subject which is much misunderstood generally. Thomson did some splendid work on the subject some years ago, but since then no great progress has been made. He found that rubber threads treated with a small quantity of oil preserved all their properties. With a larger quantity oxidation set in very quickly. Coconut and palm oil acted the most energetically; castor oil had the least action, and is one of the few not harmful to rubber.

WHAT AUTO INVENTORS ARE DOING ABROAD

IN the construction of ordinary wooden artillery wheels the spokes are placed, as is well known, radially to the hub, where they are in a position which has hitherto been considered the best if not the only possible one for them to occupy under the circumstances, says the *Automotor Journal*. The spokes of wooden wheels are, of course, in compression, in which respect they differ from those of the wire wheel, which are in tension,



TANGENT SPOKE AUTO WHEEL.

and which are in consequence arranged tangentially to the hub. To place wooden spokes tangentially to the hub, therefore, is essentially a radical departure in wooden wheel construction, but it would appear from the success which has so far met the production of the tangent wheel shown in the accompanying illustration, that there is a good deal to be said for this method of arrangement. On the wheels made by this firm the spokes have wedge ends, instead of being turned down into tangs, and at the hub these wedges lie close up against one another to form a solid boss similar to that of the ordinary artillery wheel, except that the center lines of the spokes are tangential instead of radial. At their outer ends the spokes are wedged into the felloe so that they obtain a bearing surface across their full width. Among the features claimed for this principle of construction are that it gives greater resiliency and longer life to the wheel. The increased resiliency is attributed to the spokes bending slightly under sudden shocks, while longer life is claimed to result partly from the increased resiliency and partly from the reduced effect which shrinkage in the spokes has on the wheel as a whole.

Some Detailed Refinements of the Adler.

In addition to displaying that painstaking thoroughness that is characteristic of the Teuton, the German automobile builder has also demonstrated that he is not behind his confrères of any other nation in devising those refinements of detail that add to the convenience and safety of the car in operation. The Adler, which was prominently staged at the recent London show, affords an excellent example of this. As an instance, there may be cited the use of a toe pedal for admitting fresh water to the cooling jackets of the brake drums, this pedal being part of the regular

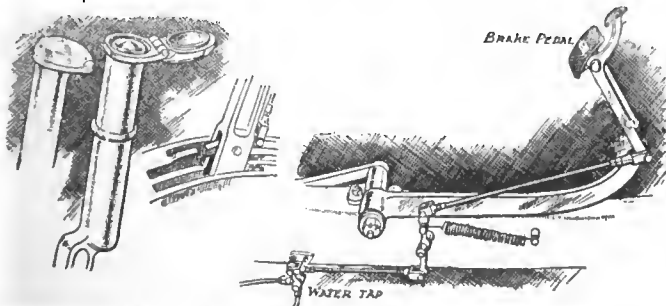


FIG. 1.—Concealed reverse trigger.

FIG. 2.—Toe pedal to admit water to brake drum

NEW DETAIL FEATURES OF THE ADLER CAR.

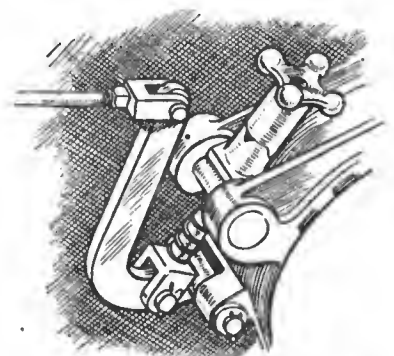
brake pedal, and may be brought into action together with the latter or not, as desired, a slight change in the angle at which the foot is held in braking being all that is required. The con-

nections of the device are clearly illustrated in the accompanying sketch from *Motor* (London), to which we are also indebted for those of the Adler concealed reverse trigger and the Nacke hand adjuster for pedal brakes. As will be plain, the water cock of the oscillating type is attached to the frame directly behind and in line with the brake pedal.

The illustrations of the concealed reverse trigger are practically self-explanatory. Under ordinary running conditions, a cap covers the reverse trigger, so that it is impossible for it to be inadvertently depressed. This cap is sufficiently close-fitting not to be disturbed by the jolting or vibration of the car, but readily yields to the fingers. When thrown back, the trigger may readily be depressed the same as though no safeguard were provided. The device represents an added touch of refinement to the various methods of preventing the accidental use of the reverse gear ordinarily employed on the majority of cars.

A Very Convenient Method of Brake Adjusting.

It must be admitted even by the designer himself that there is yet considerable room for improvement in the way of facilitating means of adjusting a number of the essential parts of the average car. Naturally the millennium is represented by a car on which most of the adjustments could be made by hand, and at most the only tools needed would be a single wrench, a screw driver and a pair of pliers. That there is a more or less pronounced trend in this direction is quite evident from the number of devices brought out from time to time with this end in view. One of them that has attracted a deserved amount of attention is the Nacke hand adjuster for drum brakes of the type universally used on cars. This first made its appearance about a year ago, and has been adopted on some of the Italian cars. As the surfaces of the brake bands wear it is possible to make them snug again merely by a quarter turn of the handwheel, which automatically locks at each quarter turn unless held out of engagement by the notches shown; a helical spring maintains the adjustment wherever set.



NACKE PEDAL BRAKE ADJUSTER.

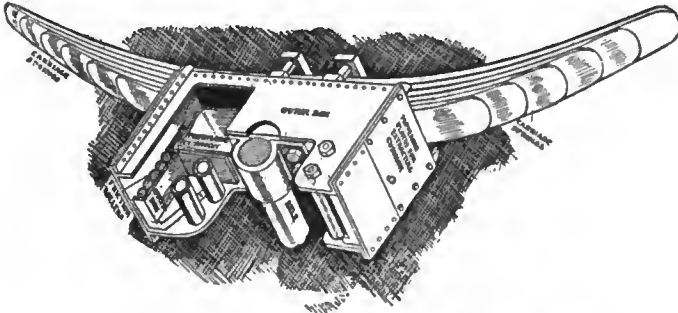
A Novel Type of Shock Absorber.

The Simplex Shock Absorber is devised to be interposed between the axle and the carriage spring, a set of four on each car thus absorbing the first portion of the shock from the road, says *Motor* (London). The device is shown in elevation and part section in the diagram. It will be seen to consist of an external box, which carries the carriage spring. Attached to the axle is the interior box, and between the two is the pneumatic cushion which acts as the absorber. The two boxes have extensions between which are steel friction rollers (lubricated with dry graphite) for the purpose of guides. When the cushion is inflated to a pressure of about 10 pounds to the square inch it will carry a load of 500 pounds. If the load per wheel is heavier than this the pressure may be slightly increased or an absorber of slightly larger dimensions can be employed. The pressure can easily be regulated to suit the character of a district. Should the cushion deflate (the likelihood of which is small), the outer box settles down on the axle and the position is thus as if the spring were rigidly bolted to the axle. One of the ends has a plate which is readily removable for the purpose of replacing a cushion.

The device is well worthy of careful inspection. It is shown complete, dismantled, and also fitted on a car on which it has been tested over a considerable distance.

Differential Locks Used on Steam Trucks.

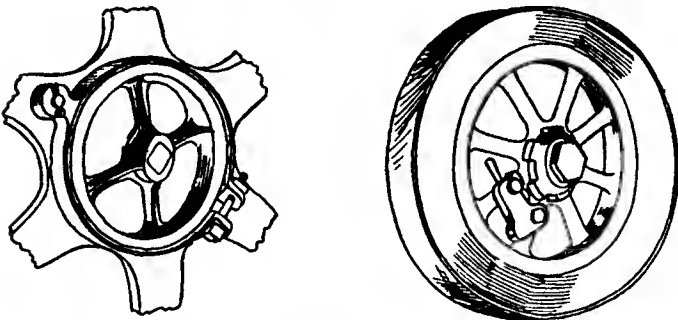
The commercial section of the Agricultural Hall show recently held in London brought forth a representative showing of what would be called traction engines in this country, but which the



A NOVEL FORM OF ENGLISH SHOCK-ABSORBER.

Englishman dubs a "lorry." Like our road rollers and plow-pullers, by far the greater number of these lorries are driven by steam and always have been. In fact, they are an ancient and well-established institution in England for heavy haulage, having existed prior to that abortive piece of legislation that barred the public roads to anything that moved under its own power, unless it went on legs. This accounts for the large number, as well as the wide diversity in which these vehicles were exhibited.

One of their features that is bound to catch the eye of the automobile sharp is the provision for locking the differential that is made on some, if not all of them. Just why the differential should be put out of action does not appear at first sight, but it is evident that the needs of a slow-going two to five-ton truck, or a tractor that may be pulling two or three times this weight behind it, are quite different from those of the swift-traveling automobile. The employment of a means for locking the differential gives all the advantages of a rigid driving axle when traveling straight ahead, and the driver always has plenty of time to operate the release gear before taking a turn. Two forms of the method employed for effecting this end are shown by the accompanying sketches. One, shown on the complete wheel, is termed the "Sentinel" differential lock, and consists of a pawl and toothed wheel, while the other, known as the "Mann," partakes



TYPES OF DIFFERENTIAL LOCKS USED ON ENGLISH LORRIES.

of the nature of a brake band, and is probably operated from the seat of the lorry by similar means—i.e., a small hand lever or pedal. In the case of the former, the pawl is fastened to the wheel and the toothed or starwheel to the rear axle, so that the device as a whole constitutes the simplest form of differential possible. For rounding a curve the pawl is pulled out of engagement, permitting its driving wheel to run free of the axle, all the power being transmitted through the other wheel, which is rigidly fastened to the axle. This gives a positive drive when in action, which would not appear to be the case with the Mann with its drum and brake band.

THE GASOLINE FAMINE.*

By L. BAUDRY de SAUNIER.

It appears that we are in danger of dying of hunger in the person of our motors. The liquid food which, vaporized and mixed with air, gives them force, is getting scarce. Week by week the rates for modern oats are rising. The reason is simple: automobiles are already too numerous. As the production of gasoline is necessarily limited, there is an eager demand for the barrels, and rates rise. A day will come when the countries producing gasoline will keep it all for themselves and we shall have no need to show eagerness.

But why is the production of gasoline necessarily limited? It is because gasoline is distilled from petrol, when the petrol contains any, for all petrols do not contain the precious liquid. Russian petrols contain next to nothing; American mineral oils give about 10 per cent; Indian petrol about the same, and Roumanian petrols contain 20 per cent. of gasoline. That is all there is.

The producer says, "You will evidently take all the gasoline I can produce, but will you also take the kerosene, the heavy oils, the greases, etc., all products of the distillation of petrol in company with gasoline, and which are produced in much greater quantity than gasoline itself? What shall I do with these? You do not ask for them at all in the same proportion as the gasoline."

In this state of affairs we turn towards alcohol, the alcohol which is to be found in our beetroots and our potatoes. I believe that in a not very distant future our internal combustion motors will be fed on alcohol. Examples of its application for our purposes are already encouraging. But we must not forget that they are only encouraging, and that everything has yet to be done to make alcohol as practical for us as is gasoline.

But is alcohol any cheaper than gasoline? No; per gallon it costs a trifle less, but we consume more. Pour it into the tank. What is this? A few drops have fallen on the paint and as many holes have been formed. Yes, alcohol dissolves paint. This is a grave defect that workshop experiments do not reveal, but which good solid practice brings to light instantly. We look glum.

Try to crank your engine. Not a bit of it. No more explosions than in a coffee mill. The motor must be warmed before it will run on alcohol. In other words, we must start with gasoline. We are off, but what a smell. It is the benzine that is burning, the benzine mixed with the alcohol to form a carburant.

We stop and examine the motor. The valves are red; the valve seats and the combustion chambers are red. A few hours of this and our engine will be paralyzed. Sorel, one of our best chemists, and one who has most closely studied this question, says that the fault is with the methylated spirits with which the authorities poison our alcohol in order that we may not drink it. As soon as the combustion is imperfect alcohol with methylated spirits is transformed into formic aldehyde or "trioxymethylene." And that is why our alcohol motor remains silent. Combustion is imperfect the moment gasification is not absolute. A carbureter which is satisfied to pulverize the liquid as our present carbureters do is deplorable when used for alcohol.

Before crying "Gasoline is dead, long live alcohol," it would be well to ask the one most interested, the engine of your automobile, what he thinks of it. Prove to a horse by most scientific calculations that wood shavings are the most modern food for the equine race, the fashionable food which ought to be in every hayrack, and he will die nevertheless, unless you know how to prepare your shavings so that they can be assimilated by his stomach.

There is certainly a brilliant future for the alcohol motor, since the liquid possesses the most precious qualities. But we should not try to foolishly convince ourselves that it is at present suitable for our motors. Everything has to be created: the carbureter which will carburete perfectly, an ignition which will fire the charge punctually, the motor itself which will use the entire practical portion of the explosion. Until that is arrived at we shall have a series of interesting experiments and a re-edition of races and industrial tests such as we have had for the last ten years.

*Translated from "Omnia" by W. F. Bradley.

LETTERS INTERESTING AND INSTRUCTIVE

Kerosene and Alcohol as Emergency Fuels.

Editor THE AUTOMOBILE:

[726.]—It being a matter of interest to me, and doubtless to others, I will be glad to have your advice as to the use of kerosene oil and alcohol in gasoline motors. Say, for instance, a party is on a trip and gasoline runs out from accident or oversight. Kerosene or alcohol can be secured almost anywhere, and I would like to know just how and what use can be made of each and how best to use them. It is a Cadillac single-cylinder 1906 Model M I am using.

ENQUIRER.

Rowland, N. C.

In an emergency such as you mention, either alcohol or kerosene may be used as fuel without any great difficulty and without making any alteration to the engine. This will be the case particularly if the engine happens to be running when the shortage of fuel is discovered, as it will then be hot, and may be started on the new fuel without any great trouble, or, better still, may be kept running merely by pouring the new supply into the tank. If the engine has stopped and cooled off, there will be more or less difficulty experienced in getting it under way again on either alcohol or kerosene, but once started it should be easy to get home. As both of these fuels require considerably more heat to properly vaporize them than gasoline does, the operation of the motor will be greatly improved when using them by conducting as much hot air from the exhaust as possible round the carbureter, beside using hot air for the mixture.

In case the engine has cooled off and will not start on the new fuel, the best method of facilitating this is to procure some hot water. Take some old rags or waste, soak them in the water, and swathe the carbureter with them in order to raise its temperature as much as possible. The rags will be preferable owing to the danger of getting lint into the carbureter when using waste. Vigorous turning of the crank will assist the vaporization. If a down-grade be handy, let the car roll down it, and when some momentum is attained ease in the clutch gently on the high gear. Owing to the greater suction exerted on the carbureter by the engine under such circumstances, this is an expedient that seldom fails to start it, other things being in order. Failing the convenient hill, a few husky men or a horse to get the car rolling will suffice. Never use anything but the high gear or direct drive and ease it into engagement very gently; throwing in the low gear will bring the car to a sudden stop on the level, or impose a terrific strain on the transmission if the car happens to be coasting.

Why One Cylinder Fired Louder than the Others.

Editor THE AUTOMOBILE:

[727.]—In response to request contained in letter No. 698: The trouble which caused the louder exhaust in one of the four cylinders of my engine was in the hammer vibrator spring, which I conclude was too stiff to admit of its being perfectly adjusted, and I think on this account only fired part of the charge in that cylinder. I had previously put in a new contact spring which did not remedy the trouble, but upon putting in a new hammer spring the trouble was immediately overcome and each exhaust from the four cylinders is now perfectly equal in sound again.

Westfield, Mass.

LELAND M. GILMAN.

While the lag in one of the coil vibrators may have been responsible for the uneven firing of one of the cylinders of the four-cylinder engine in question, your conclusion that the greater amount of noise developed arose from the fact that only part of the charge was fired would hardly appear to be correct. If less than the normal charge were being fired by that particular cylinder there is good reason to believe that the sound would have been less rather than greater than that of the other cylinders. What was probably the case, in view of the fact that the change to another vibrator cured the trouble, was that the lag delayed the explosion enough to destroy the sequence and the late one was emphasized by occurring slightly out of time.

Concerning the Worm Gear Type of Drive.

Editor THE AUTOMOBILE:

[728.]—I note in the April 4 issue of "The Automobile" an illustration of a Franklin truck Type J, with a worm and gear drive. Can you give me any additional information regarding other users of the worm and gear drive, also reference to any tests of well-designed worms and gears? Any information you may be able to give me on this subject will be appreciated. I find your publication of great value as well as interest.

F. M. COCKRELL, JR.

Warrensburg, Mo.

Beside the Franklin truck you mention, the Mitchell commercial vehicles also employ the worm gear type of drive and have done so for more than a year past with considerable success. We do not know of any other automobile builders in this country at present using this type of drive, but understand that several are at present experimenting with a view to its adoption. Abroad, the Dennis buses have used it for two years or more, very successfully, we believe. The efficiency of the worm and gear drive is relatively low, and, unless properly designed and well made, very low, so much so in fact as to preclude its use. The amount of loss through friction naturally varies with the pitch as well as the velocity at the pitch line. With the latter at 100 feet per minute, a worm of 10 degrees pitch gives an efficiency of 82 per cent. as compared with 98 per cent. for spur pinions and .955 per cent. for 45 degree spiral pinions. Increasing the velocity to 200 feet per minute with the same pitch as mentioned, gives an efficiency of 86 per cent.; with worms of 5 and 7 degrees, respectively, the efficiencies are .765 and .815 per cent. respectively at the same speed. The tests from which these data were obtained were made on ordinary machinery at low velocities, and consequently have little if any bearing on the use of this type of gearing on the automobile. Marsh, Williams & Co., Philadelphia, Pa., are makers of this class of gears and will doubtless give you any detailed information you wish.

Poorly Aligned Gear Shafts Cause Binding.

Editor THE AUTOMOBILE:

[729.]—Will you kindly publish in "The Automobile" a remedy for the following? I have a two-cylinder Clement-Bayard—a grand car in all ways, with the exception of the great rattle in the transmission gear case from the gears. It has three forward speeds, and sometimes when travelling on the direct drive or high-speed, I have a hard time to shift gears in order to stop. I have to exert all my strength against the shifting lever to get the gears out of mesh. The jack shaft is directly over the other shaft. Should the teeth of every gear be on a direct line with the others, so as to make a straight line? Also, could I use fiber gears? Could I use a little air pressure on my common gasoline tank, which is a trifle lower than the carbureter?

Hoping to see these questions answered in "The Automobile," which I read regularly.

C. W. BYE.

Corona, L. I.

It seems evident that one or the other of the shafts in the gear box has been sprung out of line, in all probability the jackshaft, or it may be that both have got out of line, which would account for the binding, as you mention disengaging calls for considerable strength. The teeth of all the pinions should be in an absolutely direct line, so that they will coincide when brought together, and when in this condition there is no difficulty in either engaging or disengaging the gears. Doubtless you will find that both the pinions themselves and the bearings of the shaft have become worn, the latter particularly being responsible for a great amount of chattering and rattling, as it permits the entire shaft to jump and bounce, according to the amount of play there happens to be. If the bearings are snug and the gears accurately aligned, we see no reason why the gearbox should make an unusual amount of noise, especially if the gears are kept properly lubricated. Fiber gears would never stand such service as the pinions in a change-speed gearbox are called upon to perform; they would go to pieces in a very short time. If the pinions in the car at the pres-

ent time are very badly worn, it will be necessary to replace them to make the car silent-running. Should the objectionable noise still continue after making the necessary repairs and replacements, as above suggested, we think the expedient commonly resorted to on electric street cars might be adopted to advantage. This consists of filling the gear boxes with a mixture of grease or heavy lubricating oil and sawdust. In your case it would be preferable to use jewelers' sawdust, which is very fine. This has been used with good success on old cars afflicted with trouble similar to yours, but it is a poor remedy at best to muffle the clattering made by a worn and badly aligned set of gears—correct these evils first and see if the one you complain of does not disappear with them before adopting this.

There is no reason why you cannot use air pressure on the tank now fitted on the car. Of course, it will be necessary to fill the air vent in the present stopper.

Annular Bearings for Thrust.

Editor THE AUTOMOBILE:

[730.]—In an ordinary annular ball bearing, of the Hess-Bright non-adjustable type, a suitable bearing to sustain thrusts? I have noticed numerous applications of this bearing to this character of service, but I cannot understand why it is well to use it so, when it is remembered that the same concern makes an excellent type of thrust bearing, especially adapted to its purpose.

Rochester, N. Y.

GEORGE A. ELLIS.

Annular ball bearings make excellent thrust bearings, and are perhaps rather easier to find space for in a given design than the more highly specialized thrust bearings. The fact that thus used they will take either thrust or lateral stresses is a point in their favor. Used for thrust it is customary to leave them free in a plane at right angles to the axis of the shaft, but to confine them closely in the other direction. Just the opposite applies to the same type of bearing used in the ordinary manner. It is well to bear in mind that when an annular ball bearing is used for thrusts, all, instead of one or two, of the balls are dividing the load, whereas with the same bearing under other conditions one or two balls must be capable of carrying the whole load.

Advisability of Solid Tires on Steam Runabout.

Editor THE AUTOMOBILE:

[731.]—I would like to know if it would be advisable to employ hard (solid) tires on a Stanley steam runabout. What other solid tire is made in the shape of a T, or along those lines, beside the Swinehart? Any information you or your readers can give me on this subject will be appreciated.

Newton Center, Mass.

C. C. BUTTS.

There is no reason why you should not be able to use solid tires on your car, particularly if the roads in your section are good, but it will be to greater or less extent sacrificing your comfort, as there is bound to be more vibration and more jolting felt with the hard tires than with the pneumatics. Your car is so light and easy running that we should hardly think the change worth while, and certainly would not recommend it. If you will equip your car with a good double-tube pneumatic tire of the proper size to carry its weight, you should have little or no trouble from this source. You will find the various makes of solid tires announced in our advertising columns.

Some Queries Concerning Compression.

Editor THE AUTOMOBILE:

[732.]—I would be obliged if you could give me in your valued paper some information re correct compression in cylinders. What would be good compression for a four-cylinder, 15-horsepower car having cylinders of 3 1/2-inch bore by 4 1/2-inch stroke? Also, has a car with larger cylinders greater compression? Of course, I understand the nearer the head of a cylinder the piston goes the greater the compression, but I take it automobile manufacturers all design engines so that pistons rise as high as possible in cylinders—so that need not be taken into consideration.

Toronto, Can.

P. C. LARKIN.

The correct compression in any motor cylinder would naturally be that for which it was designed, so what would be the correct compression for one would not be the same for any other except

of the same design, size and make. Sixty to seventy pounds to the square inch would be a good compression for a motor of the dimensions you mention to have an output of 15 horsepower at a speed of 1,200 to 1,500 r.p.m. or over. An increase in the size of the cylinders does not necessarily mean a corresponding increase in the compression. While the power for the same size increases with greater compression, there is not only a point where the benefit to be derived would be neutralized by the greater amount of power absorbed in overcoming it on the compression stroke, but also a point where it is no longer safe to carry the compression any further, owing to the danger of spontaneous ignition; with gasoline this is about 100 pounds to the square inch.

Automobile engines are not designed so that the piston rises as high as possible in the cylinder, nor for that matter are any internal combustion engines. A space known as the clearance is always allowed for, and the depth of this in connection with the design of the cylinder, valve pockets and the like governs the compression. This clearance or combustion chamber is usually calculated with reference to the length of the stroke, and ranges from about 20 to 35 per cent. of the latter, these figures probably representing the extremes in either direction. This part of the cylinder is generally counterbored to a slightly greater diameter.

Instruction Books Wanted by General Repairers.

Editor THE AUTOMOBILE:

[733.]—As there are a number of factories that make a business of repairing automobiles in addition to their regular work without having the agency for any particular car, we would like to ask if "The Automobile" does not think it advisable for the makers to furnish such repairers with their instruction books, as it would be a great help. We have more or less auto repairing to do here owing to the great number of break-downs caused by the state of the roads between Utica and Albany and we have come across cases where it has been necessary for touring parties to call the makers on the long distance telephone to find the correct setting of the valves, thus occasioning extra expense as well as delay.

We hope "The Automobile" will keep the execrable condition of the roads in this part of the State before the people; they could not possibly be worse and are a positive disgrace to civilization.

Fort Plain, N. Y.

ALPHONSO WALRATH CO.

We have no doubt that the makers of any particular car will gladly send copies of their instruction books to you upon application; by noting the particular cars most frequently met with in your part of the State and obtaining the instruction book of each you will have a library that should be of considerable assistance in making adjustments.

DARRACQ RACERS AND THE DIFFERENTIAL.

Editor THE AUTOMOBILE:

[734.]—We notice an article in your issue of April 23, being an answer to letter No. 722, written to David F. Ladin, regarding the racing cars constructed without differentials. The statement that the car with which Wagner won the Vanderbilt Cup race was constructed without a differential is a mistake. The car with which Hemery won the 1905 Vanderbilt Cup race was made without a differential, and likewise the 200-horsepower eight-cylinder car with which Demogest made two miles in :58 4-5 on the Ormond-Daytona Beach, January, 1906.

The 1906 racing cars which the Darracq company built, one of which Wagner drove to victory in the Vanderbilt Cup race, were all supplied with differentials. The 1907 cars being built for the Grand Prix race are minus the differentials.

DARRACQ MOTOR CAR COMPANY,

New York City.

G. M. MacWilliam, President.

PROPER SIZE OF TUBING FOR FLASH GENERATOR.

Editor THE AUTOMOBILE:

[735.]—I would like to hear from a number of steam users as to what size and weight of tubing has been found most serviceable, all things considered, in flash and semi-flash boiler practice. I think, from experiments last fall, that a moderately large tube is not a bad idea, since it gives the safety from leakage afforded by the water tube method and also more elasticity of control, as there is a considerable reserve, combining the best points of the water tube system with those which make the fire tube system desirable.

GEORGE A. HENDERSON.

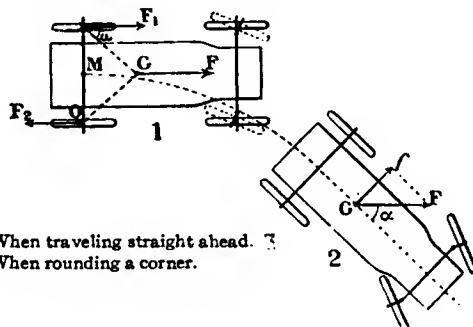
Decatur, Ill.

EFFECT OF THE DIFFERENTIAL ON SKIDDING

By PAUL BARY, IN L'AUTOMOBILE.*

NOT long since there appeared in our columns an article criticising the use of the differential on automobiles on the ground that it facilitated skidding and side-slipping. There is an opinion in Germany, disputed, it is true, but also admitted at times, that the differential does appear in this pernicious rôle. In the present article there is set forth an opinion directly opposed to the foregoing, and which is quite convincing; we think, however, that the divergence of views is such that it is necessary for every one to form his own opinion from his personal experiences, as each of the latter occurs under special circumstances and in which observations may be rapidly made as all the circumstances are known. On the other hand, the observation in question is neither methodical nor systematic because the autoist has taken no pains to make it so, and in consequence the conclusions that may be drawn from it are of little or no value.

If it were possible to make a comparison between two touring cars the same in every respect, with the exception of the rear axle, which on one would be equipped with a regulation differential, and on the other with a friction or ratchet device permitting



1.—When traveling straight ahead. 2.—When rounding a corner.

DIAGRAM ILLUSTRATING THE FORCES INVOLVED.

the wheels to run at different speeds in rounding turns, the alternate use of these two vehicles on the same curves would constitute a basis on which to find for or against the differential. Unfortunately such a comparison has never been made so far as is known with gasoline vehicles; electric cars, whether with one or two motors on the rear axle, are hardly to be considered, as there is not sufficient difference between them where skidding is concerned. Nor do they run at sufficiently high speeds to make accidents from this cause at all frequent.

In consequence, it is necessary, in order to form an opinion in the matter, to discuss the causes that lead a vehicle to slide laterally in the line of the rear axle, and to ascertain if these causes are due to the differential or to some other part of the car. We will accordingly consider the car shown diagrammatically in the accompanying sketch, and will assume that the position 1 shows the car progressing at a certain speed and with all four wheels accurately in line; the driver then applies the brake suddenly. The moving mass of the car M with its center of gravity at G tends to continue in the same direction that it has been running, as indicated by the arrow F . Whichever brake be applied, and whether it results in the blocking of both rear wheels, or only one, or whether it be the pedal brake, nothing can change the direction of the force F tending to cause the car to continue along the same line. It is, in fact, evident that one wheel continuing to turn, whether on account of the lesser amount of traction, or on account of its brake band being much looser, the force continues to act in the line of F , since the force F_1 of that wheel is parallel to F and the angle w is inalterable.

What happens in actual practice, however, is that the vehicle is not always in a mathematically straight line, and the force F acts as a couple by reason of the immovable wheel O and the

product of the reaction in the direction which the driver is powerless to maintain completely. Hence the vehicle assumes the position indicated by 2, and the component of the slipping force $f = \frac{F}{\alpha}$ may attain considerable value.

The true cause of the side-slipping is to be found in the fact that the direction of the vehicle is influenced by this lateral force, and the steering gear is never completely free from this stress, nor is it completely irreversible; any one of these conditions completely fulfilled proves an ample preventive of skidding in a straight line. It is easy to recall experiences where, in operating the brake on one rear wheel, a strong tendency for the car to turn is felt, and if this comes as a surprise to the driver, as where the brakes are applied suddenly, it is impossible to recover in sufficient time to prevent it, and the vehicle slews right round.

We are reluctant to believe that the case cited in the former article referred to, that placing one wheel on good ground and the other on a slippery surface, is particularly conducive to side-slipping, since it may be said that this is really a condition chosen by so many automobilists, who place but one non-skid tire on the rear wheels, and who by that precaution are protected in the majority of instances from those ill-effects of side-slipping that result from the use of smooth tires. (This was a more or less general practice in Paris a year or two ago.)

It is true that up to the present we have not considered that special rôle of the differential which is illustrated where, with the cardan shaft held, one of the wheels is turned by hand, and the other immediately begins to turn in the opposite direction, the same action taking place in service where, with one of the wheels equipped with a non-skid tire, it continues to turn forward in the direction of the travel when the other is compelled to rotate in the opposite direction.

Again referring to the illustration, let us assume that one of the wheels is held at O and the axle is subjected to a force F_1 in a direction counter to that of F_2 . These two forces will produce a couple tending to cause the vehicle to turn about the center of the rear axle M , a movement that cannot be produced in traveling except by lateral slipping of the forward part of the car. This slipping not occurring, the simultaneous action of the two rear wheels turning in opposite directions will be without any direct effect; it will operate, however, as we have already mentioned above, in the direction of the forward wheels.

On the whole, we think the possibility of eliminating the differential forms an interesting subject for study, and its successful culmination would constitute marked progress, just as the abolition of such a relatively delicate piece of mechanism would from any machine, but unfortunately it would not result in the prevention of side-slipping and sudden slewing round, which with the present long vehicles can only be avoided with good non-skid bands and well-fixed steering gear.

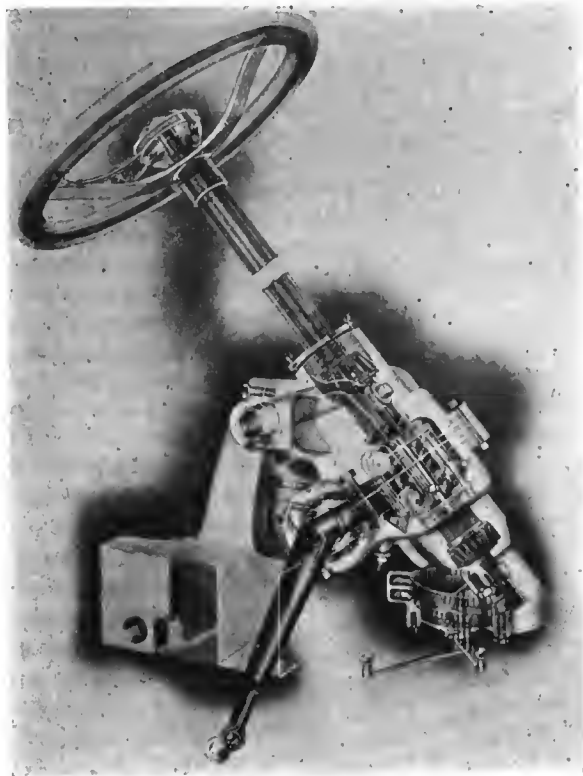
TOTAL ANNUAL CONSUMPTION OF ALUMINUM.

One of the striking results of the great progress of the automobile industry has been the tremendous development of the manufacture of aluminum, of which some idea may be had merely by quoting a few figures. In France, no less than 35,000 horsepower are continually employed in the making of aluminum; Germany utilizes some 21,000 for the same purpose, the United States a like amount, and Scotland about 6,000 horsepower. This represents something like 82,000 horsepower in round numbers—an amount that can easily be doubled in the works now in existence. As each horsepower represents an annual output of 200 kilos of aluminum, it means that the total yearly production is something like 16,500 tons, of which 12,300 are produced in Great Britain and on the Continent of Europe.

*Translation by Charles B. Hayward.

STEERING GEAR WITH DISTINCTIVE FEATURES.

That a great deal of study has been devoted to the evolution of a form of steering gear designed along lines radically differing from those followed in current practice, in the making of the Marmon steering gear, will be evident at a glance at the accompanying illustration of it. A model of it with the aluminum housing cut away to show the interior was on exhibition at last



MARMON ADJUSTABLE ROLLER-BEARING STEERING GEAR.

winter's shows and received considerable favorable attention, particularly at the hands of designers and builders of cars. The casing is of cast aluminum and is made oil and dust-tight; it is filled with oil or thin grease so that all parts are thoroughly lubricated. The steering column is mounted on Timken roller bearings, one at the bottom of the aluminum case and the other at the top, thus supporting the screw and nut mechanism of the gear centrally between them. These bearings are adjustable by means of a single nut on top of the case. The steering arm, which is a one-piece drop forging, is also mounted on the same type of bearings and is adjustable in the same manner, the single nut being conveniently placed at one end.

The column carries a steel screw working in a large bronze nut having a lining of hard babbitt. Bronze pins, forming part of and extending on each side of the nut, carry slotted steel links, the lower ends of which are pin connected to the two arms of the yoke forging which is keyed to the steering arm. A wing segment in the center of the yoke forging works in a slot in the bronze nut, preventing the nut from turning and likewise relieving the links from twisting. Two set screws in the casing act as adjusting stops on the wing segment, thus regulating the extreme movement of the steering arm. With this arrangement the mechanism is held in perfect alignment.

This form of construction lends itself particularly well to the elimination of lost motion between the parts and only neglect in providing oil or very long continued use should bring it about, in which event the babbitted nut can be readily replaced with a new one at small expense. Though irreversible, the lever connections are so well proportioned with the size and pitch of the screw that the steering is very easy, giving that much desired "feel" of the road which is a characteristic of only a perfectly

balanced and easy working gear. The column has a stationary brass tube casing through which the rods of the spark and throttle control extend, being connected to two pin ratchet segments at the bottom of the case. A foot accelerator is employed to operate the throttle independently of the position of the lever over the wheel. The steering wheel itself is built up of black walnut segments on a solid three arm wheel casting, and is given a high polish in the natural finish of the wood. As shown, the entire column is mounted on a single tubular cross member somewhat after the fashion of a trunnion, permitting the slant of the column to be adjusted to suit the driver. Oil injected under the cap on the wheel lubricates all the moving parts of the column. The Nordyke & Marmon Company, Indianapolis, Ind., will make this gear a standard part of the equipment of their Marmon cars from now on.

SOME TESTS OF LUBRICATING OILS.

The diagrams herewith submitted show the results of a number of tests of lubricating oils, made by me some time ago, says A. L. Westcott in *The American Machinist*. The machine upon which these tests were made consisted of a shaft running in bearings on a machine frame, and carrying on one end a journal, running in a bearing the two halves of which were pressed together by a heavy spring. A lever arm, bolted to the bearing, was supported in a horizontal position at its outer end, on a platform weighing scale. The springs were carefully calibrated, so that the pressure on the bearing was exactly known. A suitable opening was provided in the bearing for the insertion of a thermometer. Oil was applied by means of an ordinary sight-feed oil cup, at the rate of about twelve drops per minute.

The journal was of steel, 3 1/4 inches in diameter and 8 inches long, and the bearing was of cast iron. The speed, in tests Nos. 1, 2 and 3, was 410 revolutions per minute; in Nos. 4 and 5, 500 revolutions per minute, giving surface velocities of 350 and 425

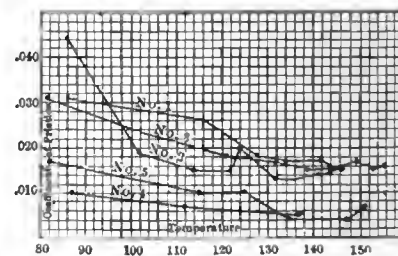


CHART OF LUBRICATING OIL TESTS.

feet per minute, respectively. The load on journal in all tests was 1,400 pounds, or 54 pounds per square inch of projected area.

The tests were about two hours in length, observations being taken of temperature and scales load every fifteen minutes.

The curves show, in general, a decreasing coefficient of friction with increasing temperature, up to 150 degrees; and the conclusion may be drawn that with the oils tested that temperature may be safely attained in practice without danger of seizing.

The sudden rise in curve No. 2, at 122 degrees, was caused by the accidental stopping of the machine at that point. It was immediately started again, and the next observation showed an increase from 0.015 to 0.020; but the following observation dropped back to 0.013. This indicates that, on starting, it takes some time for the film of oil between the bearing surfaces to become reestablished.

USEFUL FLUX FOR WELDING STEEL AND IRON.

The following flux is recommended by French engineers for welding steel and iron or steel to steel, says *The English Mechanic*: Borax ten parts, salammoniac one part, prussiate of potash one part, iron filings free from oxide or rust about one-third of a part. The mixture should be reduced to powder in a mortar. Water is added until the mixture becomes a heavy mush. It is placed on a wood fire and stirred. A material of about the appearance of pumicestone is thus produced. It is then pulverized to fine dust and is ready for use. The flux is sprinkled over the metals to be welded when they are at the welding heat.

SOME SUGGESTIONS REGARDING LEGISLATION

WALTER S. SCHUTZ and Stanley W. Edwards are the attorneys for the Automobile Club of Hartford, and in a pamphlet recently prepared by them and submitted to the Committee on Roads, Bridges and Rivers of the General Assembly of Connecticut many excellent suggestions are contained. Introducing the subject, Mr. Schutz states:

"In considering the question of automobile legislation it should be borne in mind at the outset that up to the present time all laws on the subject have been to a great extent experimental. The State legislatures found themselves suddenly confronted by a new condition. A force destined to revolutionize traffic was abruptly let loose upon the highways; machines much more powerful than the early steam engines were created and entrusted to inexperienced hands for operation; something had to be done to protect the public and the frightened horse from the 'gasoline dragon.' Police regulations, more or less elaborate, were hastily enacted to fit conditions then most imperfectly understood. Just as the science of the motor car has developed, so we have every reason to believe will the legislation upon the subject become more scientific and better adapted to the needs of the public." Following are extracts of paramount importance:

"Are Not the Roads Made for Use?"

Is it not better economy to build our roads and keep them in repair to accommodate the new conditions rather than close our highways to the march of progress because a few of the property owners along these highways object to the dust and smell? If the roads are properly built and maintained at the expense of the whole State the dust nuisance can be reduced to a minimum, and the burden of repairing the roads would be taken from the towns that cannot afford to maintain them.

The motorist frankly admits that his machine wears out the roads, and he is ready and willing to pay his fair proportion of the cost of maintenance, provided the fact is not lost sight of that the lumber team and coal cart also wear them out.

Points to Be Covered by Automobile Legislation.

The principal points which recent automobile legislation is designed to cover are: (a) Proper identification; (b) control of operators by a revocable license; (c) speed regulations which shall not depend upon traps for their enforcement; and (d) revenue.

Identification by means of plates or markers is essential to the proper regulation of motor vehicles. Practically all the State laws provide for a registration of motor vehicles, or of the owners of such vehicles, and require that one or two plates, with the registration number and the initial letter of the State, be affixed to each motor vehicle. In Connecticut and in all of our neighboring States, except New York and New Jersey, these markers are furnished at cost price by the State official who issues the registration certificate, thus securing the great advantage of uniformity. In New York the State official furnishes a metal seal two inches in diameter bearing the registration number, and this seal must be conspicuously displayed upon the motor vehicle, in addition to the number, which must be displayed on the back of the vehicle, in figures not less than three inches in height. The provisions of our present law in regard to registration and the display of markers (Section 3 as amended by Laws of 1905, Chapter 282) are probably as good as those of any other State. No provision is made for identification at night, but the requirements of the Massachusetts and New York laws that the registration number be painted upon the front lamps are useless, as it is impossible to place numbers of sufficient size upon the lamps so that they can be deciphered when the vehicle is in motion. It might be well to prescribe that the markers shall be placed not less than fifteen inches nor more than thirty-six inches from the ground.

The Commissioner of Motor Vehicles of New Jersey in his most comprehensive report discusses at length this question of identification, and, while he admits that the present system is imperfect, he has no specific remedy to suggest. He gives as his opinion that a great reform may be accomplished by an interstate system of registration numbers. Should the bill for a national system of registration presented by the A. A. A. to the last Congress become law, most of the present difficulties would be removed.

Licensing of Operators.

Our present law makes no provision for the licensing of operators of motor vehicles, and in this respect differs from the laws of

most of our neighboring States. It would seem that the restricting of the operation of motor vehicles to those of suitable age, and who are able to demonstrate their ability to operate, would be the greatest possible protection to the public; and a license issue by a State official and subject to revocation or suspension if the licensee is guilty of reckless driving, or in any other way demonstrates his unfitness, would seem to be the most efficient check upon the misconduct of the automobilist. If a person operates a motor vehicle upon a public highway at a rate of speed greater than is reasonable and proper, having regard to the width, traffic, and use of the highway, impose a heavy fine and deprive him of his license, thus preventing him from operating a motor vehicle for, say, thirty days, and you would soon put a stop to all abuses.

In most States the applicant for a license to operate a motor vehicle must satisfy the official who issues the license that he is a competent and proper person to receive the same. In a few States, notably New Jersey, a more or less rigid personal examination is required, but the New Jersey Commissioner in his report advises against it. In the majority of States one desiring to operate a motor vehicle for hire must secure a special license renewable each year. Under the present New York law only chauffeurs are required to secure licenses, and no examination is prescribed. Connecticut should follow the example of her sister States in this regard and require every operator to obtain a license; this would give the State a direct control over all motorists, which could be exercised when necessary for the protection of the public, and it would also furnish an additional means of revenue.

Non-Residents.

Our present law (Section 8) provides that a non-resident, who has complied with the laws of any other State and displays the identification numbers required by such State, with the initial letter of the same, may use our highways for a period not exceeding fifteen days in any one year without complying with the provisions of our law. It may be said that if our own citizens are required to pay increased registration fees, or are to be specially taxed upon their automobiles, to pay for repairing the roads, non-residents, who do nearly, if not quite, as much damage to the roads, should be made to contribute. It would be a grave mistake for Connecticut to enact a law that would discourage residents of other States from coming here, for all our citizens, directly or indirectly, profit by their visits. Again, the drawing of State lines should be avoided as much as possible, and free passage from one State to the other is in all respects desirable. If our citizens enjoy the privilege of using the highways of New York, Massachusetts, and other sister States, without complying with the laws of those States, we can well afford to allow reciprocal privileges.

Speed Regulation and the Elimination of Traps.

It can scarcely be denied that the net result of enforcing the speed regulations of most of the automobile laws has been to swell the pockets of a few officials, without affording protection to the public or benefiting any one except these officials. The few traps set in different parts of our State have brought rich returns to a few constables, but public sentiment is opposed to this method of enforcing the statute, for it savors of highway robbery, and in nine cases out of ten it is the harmless, though technical, violator of the law who is caught and fined, while the reckless dare-devil soon locates the trap and laughingly escapes the punishment which he so richly merits. The only true test, looked at both from the standpoint of the public and of the automobilist, is whether the speed is at all times reasonable and proper, having regard to the width, traffic, and use of the highway. The only necessity for automobile regulation is to secure, as far as possible, the safety of the public by preventing reckless driving, and this can better be secured without a maximum speed limit than with it.

The disadvantages of maximum speed limits are very clearly pointed out by the Commissioner of Motor Vehicles of New Jersey in his report, and he unhesitatingly recommends their abolition. He cites a case, which came under the observation of his department, where a flagrant transgressor, who was caught by a mounted policeman, after a desperate race, and then only upon a threat of shooting, was acquitted before the magistrate because it was not proven that the vehicle was going faster than the maximum speed limit, although there was no question but what the speed was much greater than was compatible with public safety.

The claim will doubtless be made that the removal of the fixed rates of speed per hour would be an encouragement to the reckless motorist to drive his car at top speed regardless of the rights of others. A careful study of the subject has shown that the claim is not well founded; in fact, the converse of the proposition is found to be true. Maximum speed limits encourage the reckless

motorist to take every chance and to drive his car to the limit of its capacity, except where he has reason to believe that a trap has been set for him. Make reasonableness the foundation upon which speed is to be based, and the violator would never be safe from arrest and punishment, because any bystander would be competent to testify whether the motor vehicle was being operated recklessly or so as to endanger the safety of the public, instead of leaving the enforcement of the law to an official armed with an inaccurate stop-watch, and who is financially interested in the outcome of the prosecution.

It is a most significant fact that in no State where the arbitrary maximum speed limit has been abolished has there been any disposition to return to the old standard; in fact, the entire tendency of recent legislation is strongly in the direction of abolishing these arbitrary limits. The revocation of a few licenses to operate motor vehicles, with a heavy fine or imprisonment for reckless driving, will do more to cure the evil in Connecticut than a hundred traps working to their fullest capacity!

Revenues.

There is a general and very natural disposition to tax automobiles for the upkeep of the State highways. An equitable tax for this purpose certainly would not be objected to by automobile owners, but it is no easy matter to decide upon the basis for such taxation. One thing seems certain at the outset. If automobiles are to pay a State tax they should not be subject to local taxation. Our Supreme Court has many times reiterated the proposition that "it is and ought to be the general policy of the Legislature to avoid double taxation of the same property."

Some suggest that the taxation should be according to horsepower. The objections to this method are that ratings differ materially according to the maker or the place of manufacture, and that a heavy low-powered car may do more damage to the roads than a light high-powered one. The objection to taking weight as the basis is that the heavy electric vehicles and motor trucks, capable of only very low speed, do much less damage than the lighter but higher speed gasoline cars.

A plan which has been suggested, and which would accomplish the desired result without doing violence to established principles of taxation, is for each automobile to be taxed like other personal property, in the town where the owner thereof resides, and for the towns to remit to the State a fixed proportion of the taxes thus received to be used for highway purposes.

So far as we have been able to ascertain, no State has yet passed a law laying a special tax on motor vehicles. Several have materially increased the license fees for the purpose of revenue, and in Vermont, Rhode Island, New Jersey and Pennsylvania, as well as many of the other States, all fees and fines are applied by the State to the maintenance of State roads.

ONE YEAR IN WHICH TO REGAIN YOUR NUMBER.

ALBANY, N. Y., April 29.—That bill of Senator Wemple's to permit the Saratoga Lake Bridge Company to charge 25 cents toll for autos crossing the bridge, which is a rate twice as large as that charged any other vehicle and in direct contravention of the Whitney law enacted this year providing that the rates for motor vehicles over toll bridges and toll roads shall be uniform with those charged animal-drawn vehicles, got out of the Commerce and Navigation Committee in some peculiar way last week, but was recommitted on motion of Assemblyman Whitney, of Saratoga. It cannot now get out except through the Rules Committee, and it is not expected that the Rules Committee will take it up.

Senator Davis, of Buffalo, has introduced an amendment to Section 1, Subdivision 4 of the motor vehicle law, which reads as follows:

"If within one year from date when such seal shall have been returned, and the person to whom such seal was issued shall become the owner of a motor vehicle, and shall file in the office of the Secretary of State the statement required by Subdivision 1 of this section, and pay the fee required by this section, and, in such certificate, or at the time of the filing thereof, shall request the reissue to him of a seal bearing the same number as the seal surrendered, the Secretary of State shall issue to such a person a seal bearing the same number as that borne by the seal returned. After the expiration of one year such secretary shall issue to any persons applying therefor, and filing the proper statement, and paying the fee of \$2 as provided in Subdivision 1 of this section, bearing the number of any seal so returned and unissued."

AMERICAN CARS IN NEW BRUNSWICK.

United States Consul Hebbard Willrich, St. John, tells of the progress of automobiling in New Brunswick Province, the first car, an \$800 runabout, having been introduced in 1903. There were eighteen autos owned in the Province in 1905 and double that number in 1906. An association formed met with considerable success in securing funds for the improvement of the highways, the amount obtained being \$140,000 which expenditure has placed the Province roads in fairly good condition. Along the St. John river the scenery is unsurpassed. Some seventy cars are now owned in the Province, the great majority of which belong in the class ranging from \$2,000 to \$3,000. The remainder, with the exception of several French cars, are light touring cars and runabouts, ranging upwards from the buck-board. Fully 75 per cent. of the cars are of American manufacture, despite the import duty of 35 per cent.

Consul Willrich concludes: "Now is the time and opportunity for American manufacturers to cultivate and exploit this field, practically untouched. American machines are well introduced and have a big lead. They should retain it. The topography of this province demands machines that are both light and strong and good climbers, as the roads are up and down with seldom a long stretch of level. The scenery of this country almost everywhere is exceedingly attractive, hence offers much inducement to outdoor locomotion.

"As one of the best means of securing an increased sale of American machines, I would suggest the early establishment here of an American automobile agency having cars of different grades and prices in store, in charge of a competent mechanic able to make ordinary repairs. St. John, as the chief distributing point for the lower provinces, would be the proper place for the establishment also of a commodious and well-equipped garage, and I have no doubt that an investment here of that sort would prove a paying venture."

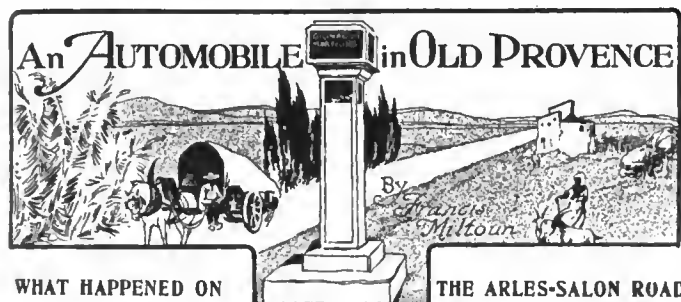
SOME GERMAN AUTOMOBILE STATISTICS.

United States Consul H. W. Harris, of Mannheim, advises that the *Deutsche Bergwerks Zeitung* recently published an interesting review of the German automobile industry, and especially recounting the progress made during the past six years, from which he compiles the following:

The review shows that the automobile, regarded for some years in Germany as a luxury only for the nobility and the very rich, is rapidly becoming popular and creating a demand for light vehicles of the runabout class. The many auto expositions which have been held, touring contests, and other events have greatly aided the industry as a whole. A more tolerant view on the part of legislators, the courts and police officials, and the public press has tended in the same direction. The value of the total product of the German automobile factories for the past five years is stated to have been as follows: In 1902, \$2,613,000; 1903, \$3,808,000; 1904, \$9,520,000; 1905, \$16,660,000, and 1906, \$23,800,000.

The value of automobile imports into Germany in 1906 is stated to have been about \$4,284,000, as against \$5,236,000 of exports. A larger proportion of this foreign trade has been with France than with any other single nation. For the six years, 1901 to 1906, inclusive, the imports of automobiles from France increased from \$214,000 to \$2,618,000, and the exports of machines thereto during the same period rose from \$119,000 to \$952,000. The total automobile exports from Germany to all countries have been from year to year somewhat larger than the total imports, the relative rate of increase being in favor of the export trade. It is stated that the German automobile industry, under like tariff conditions, will be able in the future to fairly compete with the same industry in other countries.

From the *Masonic Standard*: "Noble James McGee, of Mecca, has accepted an invitation to command a division in the Shrine parade at Los Angeles. The division chiefs, instead of bestriding barbed steeds, will mount wild and untamed automobiles."



WHAT HAPPENED ON THE ARLES-SALON ROAD

NOBODY really knows what actually did happen. We were bowling along in a light car, over the same famous bit of roadway on which the 200-horsepower Darracq first broke the record for the flying kilometer, when suddenly there was an abrupt stop of everything which had previously been in motion. The great pebbly plain of the Crau stretched north, east, south, and west in all its lonesomeness, with no one to give us a helping hand or to tow us into a Salon garage, a good twenty kilometers away. It was a discouraging prospect.

Everything was put out of business for the moment, the accumulateurs had turned over and the occupants of the front seat and the tonneau all but precipitated to the ground. Visions of a gripped piston, a broken cranksbaft and everything else to be thought of passed through the minds of all of us in the brief interval required to get over the shock and the surprise. It was but a moment of time before the *manivelle*, as the French neatly call the cranking-handle, was gently turned and went over with its accustomed ease—nothing wrong there. A good strong shove on the automobile showed that it rolled over the smooth road without indicating that anything was wrong with the transmission. With these facts well established and with a general lookover of the gasoline supply pipes, the wiring, and the thousand and one little intricacies that only the habituated chauffeur can diagnose with a glance of the eye, the current was switched on—the brakes hard on meanwhile—and a cautious effort made to put the motor *en marche*. The unexpected happened! Or, rather, nothing out of the ordinary happened; the thing went off as though it had only been stopped while we were taking a fifteen minute look around the landscape. This was one of the capricious moods of the automobile, moods which, if not frequent, are ever on the eve of being sprung on the unsuspecting chauffeur. "*Sont capricieuses comme les femmes*," said an old shepherd standing by, who with his flock of a couple of hundred *moutons à laine*, are almost the only residents of this great stony plain. And we were inclined to agree with him. This particular automobile, it is only fair to say, ran another three thousand kilometers without the least involuntary stop. It had been done nobly, and was to be forgiven.

A Stop Which Led to Old World Scenes.

But for this involuntary stop in the Crau it would have slipped our minds entirely that we were on classic if not hallowed ground, for we were bound Italy-wards and had never a thought but to make the *vitesse* and get over the frontier at Vintimille as soon as possible. As it was, someone of the party suggested that we spend the night at St. Rémy, just over the crest of the purple Alpilles to the right, the last spur of the French Alps, as they bury their fore foot in the shallow plain of the Bouches-du-Rhône. It was the artist who suggested this, for she had memories of a long summer spent in the household of an estimable bourgeois of St. Rémy and had not forgotten either the classic excursion to Les Baux for its shepherds' midnight fête, or to the home of the poet Mistral, and the thousand and one marvels of this all-but-unknown tract of country, as weirdly strange and full of character as any similar area to be found. It is a district in which the tourist *en auto* might spend all his available leisure to advantage.

Where Hemérys Break Records and Tourists Speed.

By all means the thing to do was to spend the night at St. Rémy; the chance might not come our way again, involving so

little forethought on our part. We turned off the great national thoroughfare, the Arles-Salon road, with the memory of the most superlative bit of roadway in all the world burned well into our brains. Almost the whole distance from Arles to Salon, something like forty kilometers, is as straight as an arrow and as flat as the proverbial billiard table. In addition its surface is as smooth and hard as if it were of marble and about as dazzlingly white as that variety of which tombstones are made. It is, indeed, the finest bit of natural roadway in all the world, and we were glad indeed, when we came to think of it, that we had not scorched over it at "80" or a "100" an hour (kilometers, not miles) as is mostly done by passing automobilists. Les Baux called us, however, and the thought of the good things to eat that night and the comfortable quarters to be had *chez Teston*, at the Grand Hotel de Provence, did the rest, and Italy for the nonce was far from our minds.

Les Baux, reached only by road from Arles or St. Rémy (here's where the automobilist has the advantage of the traveler by rail), is one of the reminiscent wonders of the past that tourists to the Riviera should by no means give the go-by, as they mostly do. For that matter, they should not neglect Arles and Avignon. They are something more than dining and sleeping places, though not many seem to realize this until they get on the spot. There is so much history connected with both these cities of celebrated art that the wonder is that they have not become really popular shrines before now; Arles with its Roman arena, almost as great as the Colosseum, and Avignon with its Palais des Papes are certainly suggestive of much in the way of attractions that the most callous scorcher will hardly want to pass by when he comes to think of them.

Mem.—Don't pass by Arles, Avignon, St. Rémy or Les Baux, or you will miss much of what you come abroad for.

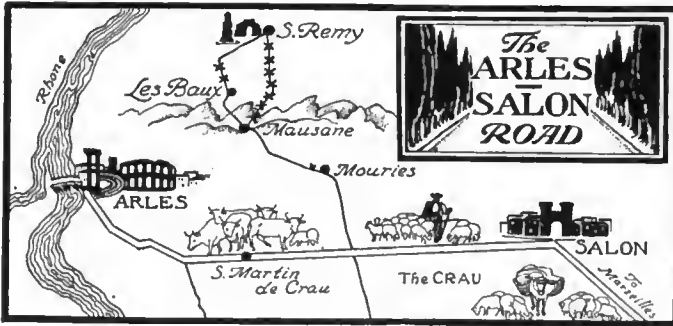
In the Home-land of the Haughty Seigneur.

The distances between these charming Provençal towns are astonishingly small and a week's tour among them, between Avignon and Marseilles and westward to Nimes, will give one at least a score of surprising delights in the way of quaint sights and scenes, and good eating and drinking at modest little inns, which will be a revelation to those who have hitherto been frequenters only of the resorts.

Les Baux is a mere weatherworn souvenir of a city whose glory has long ago passed into foggy oblivion. Once its seigneurs held sway over sixty Provençal towns and cities whose inhabitants didn't dare to call their souls their own but went and laid them at the feet of their feudal lords, the seigneurs of mouldering old Les Baux. Now, though



MOUNTAIN ROAD TO LES BAUX.



a ruin, Les Baux is a sight so wonderful that it is only comparable to Pompeii. It is virtually a dead, buried relic of a once proud and wealthy metropolis, though, unlike Pompeii, it sits imposingly on a rocky peak, with the great plains of the Crau and the Camargue stretching away seaward, and the rich, alluvial prairies (where at Chateaurnaud is the largest market for primeurs, or early vegetables, in all France) to the north, with now and then the glint of the gold dome of the cathedral at Avignon and the sky-line of the Palace of the Popes showing through the sunlight like a veritable mirage.

It's a long, hard climb up to Les Baux from whichever side one tackles the mountain road. It is six or eight kilometers up a regular mountain side, with rocky gorges, picturesque defiles and all the accessories which go to make up a picture by Gustav Doré. As one swings around the last hair-pin turn and dodges the last flock of sheep and their worrying dog he comes at once abruptly on the little Place of Les Baux, where now two hundred inhabitants pass to and fro, replacing the sixteen thousand of another day.

There is nothing quite so weird and strange as this in the center of a thickly-populated region round about in all France. There is a hotel of sorts—a very poor sort, and there is an apology for an "auto garage," as you learn from a great white banner swung to the breeze in front of the Hotel Monte Carlo. It's nothing much, but you may stable your machine along with the omnibus which makes the round twice a day from Arles.

Charms of a City of the Misty Past.

The old defences, the fortress-chateau, and the city walls are defined as well as one might expect of anything which has had to stand up for centuries against the icy blasts of that terrible "norther," the mistral. For the most part the town is a ruin and a wilderness, but here, there and everywhere a turn of the shovel or even a sharp glance of the eye will point out buried evidences of the splendor that once existed.

Once proud and revered seigneurs and fair ladies stalked through the grim halls of the chateau where an occasional antiquarian toddles to-day, but for the most part it is the abode of owls and other nocturnal rambles which must give the shudders to anyone venturesome enough to go up there in the night.



FROM CLOISTER TO SHEEPFOLD, ST. REMY, IN PROVENCE.

The chief evidences of existing splendor are found only in the "Temple," a sixteenth century religious edifice, which is a luxurious ruin if nothing more. "Post Tenebra Lux" may be read over its portal, but one will have to build up its past for himself, as the religious functions of Les Baux to-day, such as the shepherds' midnight fête at Noël and the Fête de Vincent in January are more strangely weird and fantastic than they are splendid and magnificent.

From all parts of the surrounding country, and often from the Alpine regions, come the shepherds to Les Baux for the midnight mass at the Fête de Noël, that they may pray and be prayed for; that they may be deserving of a growing prosperity, and that their flocks may increase in number, and, above all, that the price of wool will continue to be as good as it has been—and better. Very practical this, but no one who has ever seen the weird midnight processionings with lighted candles and lanterns and great rows of men, women and children climbing up to the hill-top town of Les Baux from the lower plains at the base will doubt the sincerity of it all. Prayers need not be made in city churches to be effective, indeed the other kind seem to be the most efficacious.

Where Mistral Found His Inspiration.

The round of the sights of Les Baux, which are many, will occupy one hour or three as you choose, and then there is the "Trou di Fado," or the "Grotte des Fées" or the "Fairy's Well," or whatever you may choose to call it.

You get the pure Provençal tongue hereabouts almost to the exclusion of the French, and if your demand for the road leading to the "Grotte des Fées" is not productive of anything except a jabber, you may know that you have struck some old-school Provençal who has never been taught French and hasn't chosen to learn it for himself.

There is a two hundred and eighty meter drop down into St. Rémy on the north side of the Alpilles, where all that is lacking at Les Baux awaits one and his automobile.

On the occasion of which we write we made the nine kilometer descent just as dusk had fallen. There is little or no twilight here and night comes with a rush. Our lanterns and our phares were alight and the effect was as strange and spectacular as a stage-setting. Nothing surprising happened and we made all the lacets, or hair-pins, safely, taking corners slowly, as indeed one must, and just escaping a flock of sheep by the thickness of the paint on our mud-guards. Every rock and tree stood out in bold relief, and though the hour was not yet six it was as dark as a pocket, and still as if it were the desert.

We arrived safely before the door of St. Rémy's excellent hotel just as the soup was being served and, after the necessary "wash and a brush-up," did full justice to Teston's Provençal cooking and slept the sleep of the just in a great four-posted bed in an appallingly spacious apartment overlooking "les antiquités," a brace of Roman relics—a great mausoleum-like tomb and a triumphal arch—whose history is lost in the night of time.

St. Rémy is *toujours une ville morte*, say the inhabitants, but for all that it is as delightful and sleepy an old-world town as one will see on a long round of French travel. It would be an ideal place to while away a month, or a year for that matter, and it would doubtless wear well.

(To be concluded.)



A STREET IN LES BAUX.

HAPPENINGS IN THE BUSY LAND OF CLUBDOM

Windy City Clubmen Prepare for Season's Campaign.

CHICAGO, April 30.—Preparations for the entertainment of the Glidden tourists when they reach this city on July 13 were inaugurated by the action of the Chicago Automobile Club in instructing its racing committee to arrange a short program of events for that day, providing a suitable track can be obtained for the purpose. Chairman C. E. Gregory has in mind the old Harlem race course for the purpose, providing the expense of putting the same into shape for racing is not too great.

Plans for the observance of Orphans' Day—June 12—were formulated by the Chicago Automobile Club at the last directors' meeting, and the following committee was appointed to take charge: Joseph F. Gunther, chairman; Frank H. Pietsch and C. E. Gregory. Progress on the construction of the club's new house on Plymouth court was reported at the meeting, and there is every evidence that it will be ready by May 30.

The Bay State Meet to Have Two Long Races.

BOSTON, April 29.—Entry blanks are being sent out by the racing committee of the Bay State Automobile Association for the fourth annual race meeting to be held on the Readville track on Memorial Day, May 30. The programme is quite different from those of previous meetings in that there are to be only two events: races at 100 and 50 miles respectively. The 100-mile race is open to all stock gasoline touring cars. Mufflers, mud guards and lamps may be removed, otherwise the cars must be as per maker's catalogue. Each car must carry one passenger in addition to the driver. The fifty-mile race is open to all stock gasoline runabouts and the conditions are the same as for the touring car race. Silver prizes are to be given to the first three to finish the touring car race and the first two in the runabout race. The committee is well pleased with the response among owners of cars and expects to have as many as twelve machines



COMMITTEE OF THE HARRISBURG MOTOR CLUB THAT SELECTED THE COURSE FOR THE ENDURANCE RUN OF MAY 6-7.

First White steamer on left—R. H. Johnston, of the New York Motor Club, who will distribute the confetti on the run; second White steamer—R. C. Haldeman, chairman of the committee; W. R. Douglass, I. W. Dill, and C. C. Crispen; Stanley car—George G. McFarland, Vice-President O. C. Robinson, L. A. Fannel, and Andrew Redmond; Pullman car—E. G. Irwin, R. L. Morton, Charles Cumler, and J. Aldrich.

The contests committee of the Chicago Motor Club, which will have charge of the second annual Elgin-Aurora reliability run, the Algonquin hill-climb, and the Cedar Lake economy contest, and which will be run jointly with the Chicago Automobile Trade Association, has been appointed and is constituted as follows: Charles P. Root, chairman; B. C. Hamilton, J. V. Lawrence, B. C. Buxton, F. W. Cornish, H. P. Branstetter, and J. C. Zimmerman.

A. C. A. Jamestown Tour in October.

NEW YORK, April 29.—The Runs and Tours Committee of the Automobile Club of America has decided to have its trip to the Jamestown Exposition for club members take place the first week in October instead of in June. The present plan is to tour from New York to Washington, and then take boat to Norfolk, leaving the cars at the Capital. Returning there, the route home will be more or less diversified, the exact details to be decided upon by A. L. Westgard, secretary of the club's Bureau of Tours, who will go over the route early in the summer.

in each of the races. The entries close with L. R. Speare, chairman of the racing committee, at the clubhouse, 282 Dartmouth street, Boston, May 23.

President George Refuses Re-election in Detroit.

DETROIT, April 29.—At the annual meeting of the Automobile Club of Detroit, Edwin S. George was pressed to accept a fourth term as president of the club, but declined and was succeeded by Harry Skillman, whose work as secretary during Mr. George's administration was strongly contributory to the excellent results attained. When Mr. George was first elected president of the club three years ago, it was a small organization with few members and \$600 in debts. Since then it has grown tremendously, has its own clubhouse, no debts and a snug balance in the bank, as the result of his efforts in building it up. The other officers elected were: Dexter M. Ferry, Jr., vice-president, and Garvin Denby, secretary. E. S. George was reelected to the board of directors, and C. A. Ducharme and Louis Case, whose terms had expired, were succeeded by Garvin Denby and Walter Brooks.

Such a success was made of the century run last year that the tours and contest committee decided to make it a fixture, while another proposed annual fixture is the motor-boat race off the Pine Lake house of the club. The good roads committee succeeded in building a two-mile gravel cut-off, which reduced the distance to the country house six miles, and the farmers in that district have been so pleased with it that they have agreed to contribute to the building of an additional two miles. The gain in the club's income in one year has been \$2,000, and it is intended to make a substantial outlay in enlarging the Pine Lake house this summer.

New Jersey Club Election Promises Warm Contest.

NEWARK, N. J., April 30.—Since the regular list of nominations for officers for the coming year made public by the New Jersey Automobile and Motor Club, of Newark, an opposition ticket has been placed in the field. The regular nominations were: Angus Sinclair, president; L. T. Wiss, vice-president; James C. Coleman, treasurer, and H. A. Bonnell, secretary, while W. C. Shanley is slated for president on the opposition ticket; F. R. Pratt, vice-president; W. I. Fisk, treasurer, and Leslie P. Ward, secretary. An opposition ticket was placed in the field last year, but was withdrawn prior to election. It does not seem probable that this will again be the case, so that the election on next Monday night promises to be closely contested. The opposition members of the board of trustees nominated are Charles W. Baker, E. Z. Seitz and Dr. F. B. Meeker.

Horace A. Bonnell, chairman of the club's endurance run committee, announces that twelve entries have already been made for the three-day event to be held on May 30-June 1, and has verbal assurances that this number will be increased to fully thirty in all before the end of the month.

First Banquet of a New Greater New York Club.

NEW YORK CITY, May 1.—The City and Country Motor Club of Greater New York, with a clubhouse at 306 West 109th street, held its first annual banquet Wednesday night. The dinner was tendered to the hundred founder members and the press. It marked the formal opening of the club.

There is at the present time a waiting list of about 200, whose names will be acted upon at the next meeting of the membership committee. A very novel feature of the club is the fact that ladies are eligible to membership. They cannot, however, hold any office, excepting on special sub-committees.

Final arrangements have been made and a lease for a term of years secured for the Lake Mahopac Inn. There are garage accommodations for at least fifteen cars, and there will be kept on hand stocks of spare parts, tires, oils, greases and gasoline. Sign posts will be erected by the club between New York City and Lake Mahopac for the convenience of members.

Michiganders at Grand Rapids Elect New Officers.

GRAND RAPIDS, MICH., April 29.—At the fifth annual meeting of the Grand Rapids Automobile Club the following officers were elected: President, A. A. Barber; vice-president, Alvah W. Brown; secretary, D. Emmett Welsh; treasurer, J. R. Jackson; board of governors, Fred M. Rowe, William Wurzburg, Dr. Warnshuis and the above named officers. One of the most important features of the meeting was the appointment of a committee whose duty it will be to further the cause of good roads in this vicinity. The committee consists of George W. Hart, C. C. Filberts, C. J. Bronson, W. B. Vandecar and Robert Erwin. Thirty-five new members were added at the meeting.

Adirondack Autoists Organize New Club at Sandy Hill.

SANDY HILL, N. Y., April 29.—The Adirondack Automobile Club has been organized at this place with twenty charter members, and the following board of officers: President, W. A. Hup-

puch; first vice-president, W. R. Durkee; second vice-president, M. C. Allen; secretary and treasurer, W. J. Gallagher. The club has affiliated with the New York State Automobile Association and the American Automobile Association.

Energetic efforts will be made by the club to improve the roads in this immediate vicinity. The Lake George-Glens Falls State road is in many places very dangerous to automobilists on account of the numerous sharp turns, and as it is one of the main thoroughfares from Saratoga to Lake George during the summer season, it is thronged with high power touring cars most of the time. The club is having placed at danger points on the road signs cautioning tourists to drive slow.

Indiana Automobile Club Elects Officers.

INDIANAPOLIS, IND., April 27.—What answered as the annual meeting of the Indiana Automobile Club was held to-night at the Dennison Hotel. These officers were elected: President, Louis H. Levey; vice-president, S. A. McClellan; secretary, H. H. Rice.

H. O. Smith made an address as to the necessity of organization, and R. J. Eads spoke in similar vein, dwelling particularly upon the benefits of A. A. A. membership. Reference was also made to the excellent work of Edgar Apperson before the Indiana Legislature, he demonstrating to some of its members the errors in bills which they were about to pass and the effect upon the growing industry in Indiana.

Forty new members were admitted, and it was stated that the latch string of the new clubrooms in the Dennison Hotel would always be open to A. A. A. members.

Bison Autoists Object to a City License.

BUFFALO, N. Y., April 29.—Members of the Automobile Club of Buffalo have been requested by special notice from Secretary D. H. Lewis not to pay the annual license of \$5 for the operation of automobiles in the public thoroughfares, as demanded in an ordinance recently adopted by the Common Council. Former Justice D. J. Kenefick has been retained in case the law is put to a test, which is desired by the Automobile Club. Mr. Kenefick says it is his opinion the ordinance is invalid. In all there are at least 3,000 automobiles in Buffalo. Mayor Adam this afternoon sent a communication to the Common Council dealing with this subject, in which he expresses regret at the action of the club.

Long Island A. C. Decides to Return to A. A. A.

BROOKLYN, N. Y., April 29.—At its recent meeting the Long Island Automobile Club unanimously decided to rejoin the New York State Automobile Association of the A. A. A. This action was taken after a special committee, consisting of Charles Jerome Edwards, Alfred Wilmarth and Dr. C. D. Parker, had reported the results of a conference with A. A. A. officials. The renewed activity of the present A. A. A. administration and the new distribution of the annual dues, whereby three-quarters goes to the State body and only one-quarter is retained by the national organization, had much influence in taking the club back into the A. A. A. fold. Its present membership is over 400.

Capital City Autoists Improving their County House.

WASHINGTON, D. C., April 29.—With the opening of the spring season the country clubhouse of the Automobile Club of Washington on the Brightwood Road is becoming a popular place of resort. The house committee is taking an active interest in improving the facilities of the clubhouse, as well as in beautifying the grounds surrounding it. With a view to increasing the membership a committee is now making arrangements to put into attractive shape the desirability of automobilists joining the organization. The new officers of the club are working hard to make the club a success in every way.

GREAT GROWTH OF THE A. A. A.

Fifteen State associations of the American Automobile Association are now in active operation. These eight were added to the roll at the Monday meeting of the Executive Committee, held at 527 Fifth avenue, New York City: Pennsylvania, Indiana, Maryland, Michigan, Wisconsin, Missouri, Colorado and Rhode Island. The Automobile Club of Louisville, Ky., and the Automobile Club of Rutland, Vt., were also admitted, and very shortly both clubs will have become parts of State associations now in process of formation. These additions brought the grand total of the national organization to about 16,000, with several other State bodies probabilities of the near future.

President W. H. Hotchkiss presided at the session, which was also attended by Lewis R. Speare, W. K. Vanderbilt, Jr., Jefferson DeMont Thompson, G. E. Farrington, A. G. Batchelder, Secretary F. H. Elliott, and Chairmen Charles T. Terry, of the Legislative Board, and Frank B. Hower, of the Touring Board.

Chairman Hower, of the Touring Board, reported extensively concerning the annual A. A. A. tour, to take place in July. His recommendation was that a separate class for runabouts should be included in the tour. The Executive Committee concurred and accepted a cup for the runabout division offered by Mr. Hower. The rules governing the Hower cup will be exactly the same as those for the Glidden trophy, for which touring cars only will compete.

Chairman Terry, of the Legislative Board, filed a decidedly interesting report, referring to favorable legislation obtained in various States, and also made known that not a single serious objection had been expressed to any of the provisions of the Federal Motor Vehicle bill which the A. A. A. had introduced in Congress before the close of the recent session. The proposed statute will go before the Judiciary Committee of the House of Representatives upon the reassembling of Congress, with indications of a favorable report.

Chairman Hooper, of the Good Roads Board, reported that arrangements are being perfected for a convention of officers of all associations throughout the entire country interested in the improvement of the highways. According to Mr. Hooper, the era of good roads building will soon be in full sway, many States considering the subject favorably at the present time.

Chairman Thompson, of the Racing Board, announced a session of the Executive Committee of the Racing Board, to be held May 15 at the new offices of the association, 437 Fifth avenue. The appointment of this Executive Committee was ratified, and to it was referred the entire management of the Vanderbilt Cup race and similar events run under A. A. A. auspices. This committee, in addition to Chairman Thompson, contains W. K. Vanderbilt, Jr., E. Russell Thomas, Dave H. Morris, A. R. Partridge, A. G. Batchelder, Frank G. Webb, S. M. Butler, R. Lincoln Lippitt, George L. Weiss and Ira M. Cobe.

A letter received from H. O. Smith, of Indianapolis, representing a number of well-known makers interested in the promotion of a stock touring car race, stated that suggestions for such an event would be forwarded to Chairman Thompson in time for next Racing Board meeting.

Changes in the Board of Directors included the substitution of W. F. Fuller, president of the Automobile Club of Hartford, Conn., in place of J. Howard Morse, who resigns because of an extended trip abroad, and Paul C. Wolff, secretary of the Pennsylvania Motor Federation, in place of Philip S. Flinn, who requested the change, stating that his memberships on the Racing and Touring Boards occupied all of his spare time.

MALDEN CLUB PURCHASES A HOME.

The Malden Automobile Club, of Malden, Mass., has purchased the Southmayd property at the corner of Florence and Clement streets, this city, which includes a large frame residence of nineteen rooms and about 12,000 square feet of land. About \$5,000 will be immediately expended by the club in alterations and the erection of a modern garage on the property.

WIDER SCOPE OF NEW BLUE BOOK.

Instead of comparing bulk for bulk, a better idea of the growth of "The Automobile Official A. A. A. Blue Book" can be obtained by comparing one portion in the 1906 edition with the corresponding matter in the new edition. Take as an example the index matter dealing with Erie, Pa. Last year this occupied 8 1-2 inches. In the new edition 26 inches of space are occupied for the same subject. Instead of the old map, which, in order to economize space and time had a small city map incorporated with it, there is one large city map, showing all routes for entering and leaving the city. In the old book it was only possible to give three routes, all fragmentary, whereas in the 1907 edition there are five complete routes and two alternates, making seven in all. The tourist is given a comprehensive idea of the city of Erie by a new map drawn to the proper meridian point, with captions very much extended. Instead of trying to squeeze the route map in a corner of the city map this material has been made into route maps that extend complete and independent to various centers, while the small map used in the way referred to last year has been enlarged and made to serve the purpose of showing the surrounding country on a larger scale.

This is an example of the reconstruction process that has been carried out in the book. Every section that could be enlarged and improved has been attended to, so that the progress has been not merely theoretical but eminently practical. To the New England section of the Blue Book will shortly be added Sections 1 and 3, dealing respectively with New York State and the West, and with New Jersey, Pennsylvania, the South, and the West. The three volumes are published by the Class Journal Company, publishers of THE AUTOMOBILE, Flatiron Building, New York City. The price is \$2.50 per volume.

FAVORABLE FOR THOSE TOURING CANADA.

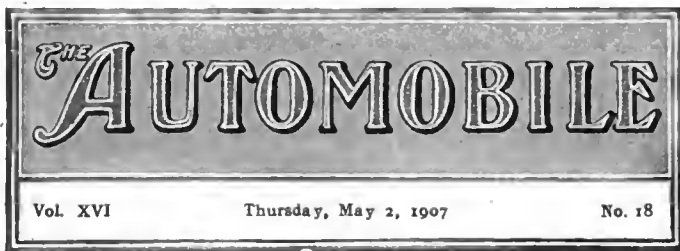
SEATTLE, WASH., April 26.—The United States Collector of Customs at Port Townsend has issued a new order concerning automobiles that are taken to Canada on tours. The new order says that to facilitate tourist travel to and from Canada automobiles may be taken into Canada, and upon reimportation to this district within thirty days will be allowed to pass the customs port without making entry.

The owner of a machine should file with the Deputy Collector at the port of exit a description in duplicates of the automobile with the maker's name and number, its retail value and the place the car will return through. A copy of the statement, duly certified by the customs officer, will be given to the tourist to be delivered at the port of re-entry. The order also says that all automobiles returning or departing by vessel should be carried as baggage, and not entered on the ship's manifest.

THE SHORT AUTO ROUTE TO THE JERSEY SHORE.

SOUTH AMBOY, N. J., April 29.—By granting the Jersey Central Traction Company the right to lay tracks on the draw of the new Perth Amboy-South Amboy bridge, last Wednesday, the Middlesex Board of Freeholders practically completed their work of establishing a short automobile as well as trolley route to the Jersey shore. The trolley company will light the bridge at night with 16-candlepower incandescents, placed 100 feet apart, and will furnish power to turn the draw. The company pays the county \$5,000 cash for a twenty-year franchise. The work of putting steel spans in the bridge to replace part of the wooden structure has been proceeding rather slowly, and it will probably be late in the summer before the bridge is thrown open to traffic. The Freeholders are having a new macadam road laid from South Amboy to Keyport. This, with the bridge and the "Hole in the Wall" repairs, will complete the new shore route.

Germany proposes to form a standing auto division in its regular army. It is said to be a pet plan of the emperor.



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Passing of the Horse as Cab and Bus Power. From the time that the first automobile made its appearance on the scene the passing of the horse has been freely predicted. So freely, indeed, that it probably must be a laughing matter to the horse himself by this time, for the prevailing prices of horseflesh have seldom been higher than during the period that has marked the reign of the automobile. According to some of the prophecies, the genus was to vanish from the face of the earth completely, but after the better part of a decade its hold on existence does not appear to have been seriously shaken. The truth of the matter is that the effect of the automobile on horse traffic only began to be visible within the past year or two in the gradual appearance of more and more commercial motor vehicles. But at best the inroads made by the latter have been sporadic and not of great moment even in the aggregate.

It has remained for cab and bus-using communities such as London and Paris to sound the death knell of the horse in the field in which he has been most numerous. London boasts of between 7,000 and 8,000 buses, and in less than two years at least 1,000 or more have been transformed into mechanical vehicles, which alone means that 6,000 horses have been taken off the streets. In Paris there are 800, of which 100 are now mechanical—a matter of 900 horses less, as Paris buses are drawn by three and three teams are used in relays. Of the 10,000 cabs that Paris can boast, 2,000 are already motor-driven, and both London and New York are seriously awakening to the motor cab. At the rate at which the two foreign cities are at present progressing in this direction, scarcely half a decade will pass before the

horse-drawn public service vehicle will be a thing of the past. In those two cities alone this means the emancipation of some 60,000 horses—probably more—so that it would seem that at least some of the predictions regarding the passing of the horse have not long to wait for their complete fulfillment.



Coming of the Poor Man's Automobile. Ever since the automobile first outgrew its original status of an uncertain plaything only to be toyed with by the ultra wealthy there has been a constantly increasing contingent who have confidently looked forward to the coming of the "poor man's automobile." Just what financial limitations may be considered as sufficiently defining the term in a country where the per capita wealth is so high, is a query not to be answered off-hand, but current opinion has it that \$500 or thereabouts is a figure at which every man can afford to have his own car, some estimators naturally dropping considerably below this while others consider that an additional hundred or two would not bring it beyond the category bounded by the title. Opinion likewise differs as to just what should constitute the chief features of such a car, but views differ as widely in this as in the field of the larger cars, so that it would be difficult to reconcile them, though it may be added that air-cooling and the two-cycle motor predominate very largely, for the popular automobile must be a simple machine.

At first sight it appears ridiculous to broach the subject of the poor man's automobile as being any nearer fulfillment at the present moment than it ever has been. Well-known cars that sold for \$3,000 but three years ago have gone up fully 40 per cent. and far more of them are sold now than was the case at the lower figure; several that started at \$2,500 only two years ago have risen to \$2,800 and \$3,000, and the same tendency has been noticeable throughout regardless of the class to which the car belongs. Better materials and better construction mean better cars, but they cost more; the automobiling public has demonstrated its willingness to meet the makers on the price question and the latter have responded generously in the matter of improvements. On the other hand, there has been evolved a totally different style of machine during the same period, variously denominated the "buggyabout," the "farmers' automobile," and the like. With their simple construction readily understood by the average man and easily repaired by the wayside blacksmith, these cars would certainly seem to represent the entering wedge that means the coming of the poor man's automobile.



Regulation Needed in One Particular. But a year or two ago, the extent to which the municipal governments of such foreign cities as London and Paris went to in restricting the automobilist doubtless appeared to be the height of absurdity to the average American autoist. Take, for instance, ordinances against the production of an undue amount of smoke; to an American such a regulation savored of nothing short of absolute tyranny. To haul a man up in a police court and either cut his ride short altogether by requiring the deposit of his machine, or mulcting him roundly for a fractional violation of an arbitrary speed limit was certainly bad enough, but to pile it on by making him pay for creating a bit of smoke was beyond all reasonable conception of the needs of the case.

And so it seemed then. Such ordinances are rigidly enforced abroad in the two cities named, the duty devolving upon the bicycle police in Paris. At a conservative estimate New York City can now boast of anywhere from 10,000 to 17,000 automobiles, a large number of which are in constant daily use, and any autoist who has much occasion to pass along streets frequented by cars can appreciate the need of an anti-smoke ordinance. It is not unusual to see a cross-walk lost to view by reason of a standing car belching forth volumes of ill-smelling vapor. New York's chauffeurs are so careless in this respect that many would be up several times a day were the French rule applied.

DETRIMENTAL GOOD ROADS LEGISLATION.

ALBANY, N. Y., April 29.—It would appear that there might be some interference with the annual appropriation for good roads building, which information will be disappointing news to all road users of the Empire State. Commenting upon the situation, Oliver A. Quayle, president of the New York State Automobile Association, to-day said:

"From present indications, legislation effecting the matter of good roads construction in the State of New York will be considerable of a disappointment to the users of automobiles. It has been supposed that the policy of this State with reference to the matter of highway construction had long since been definitely fixed, and that with greater experience would come more effective methods. A sort of self-appointed committee of three—consisting of A. R. Shattuck, a prominent automobilist; W. Pierrepont White, of Utica, a friend of the farmer and a good roads agitator, with Frank D. Lyons, of Binghamton, a politician and an ex-employee of the State Engineer's office—has been most active before the Legislature this year in urging the appointment of a commission which it was intended would supervise the construction and maintenance of the State highways. This agitation has worked itself out, not as originally intended, but in the form of two bills now pending before the Legislature, appropriating funds for good roads construction. The appropriation of former years is materially reduced or entirely done away with. The passage of these bills in their present form would not only arrest further progress in good roads building, but would, in some instances, necessitate the abandoning of work already begun."



STATE ENGINEER SKENE.

State Engineer Frederick Skene has had considerable experience in good roads construction, having given special attention to the subject of oiled roads, his experiments having developed results sufficient to justify utilizing them in practice. Mr. Skene is a resident of Astoria, L. I., was educated in the public schools of Long Island City, received the degree of B. S. at New York University in 1896, and the degree of C. E. after one year of post-graduate course in 1897. Appointed to a place in the County Engineer's office of Queens County in 1897, he remained until January, 1898; then was appointed an assistant engineer in New York City after the consolidation, and has been in charge of the engineering office of the Bureau of Highways, Borough of Queens, since 1899. Mr. Skene was a member of the Board of Governors of the Municipal Engineers' Society in the first year of its existence, and is still a member of the society. The impression is general that he is exceedingly well qualified for the office which he now holds, and there is a pronounced sentiment that he should not be hampered in carrying out the work of improving the roads of the State, begun last year, and now in danger of interference from a somewhat unexpected source.

PERCY OWEN AGAIN HEADS TRADE ASSOCIATION.

At the annual meeting of the New York Automobile Trade Association, which took place last Friday night, Percy Owen was unanimously re-elected president for another year, the other officers being Frank Eveland, first vice-president; E. S. Partridge, second vice-president; W. P. Kennedy, treasurer; E. V. Stratton, secretary and general manager, and Carl H. Page, John F. Plummer, C. Andrade, Jr., Frank Eveland, C. R. Mabley, Peter Fogarty and W. H. Haradon comprising the board of governors. The association expects to be established in its new headquarters in the Motor Mart, at Sixty-second street and Broadway, within a short time and will then begin an active campaign which will be managed by Mr. Stratton.

AMERICAN IMPORTERS' SOCIETY ORGANIZED.

An American Automobile Importers' Society is a reality, and an importers' automobile show a possibility. Fourteen prominent importers have united to form the nucleus of the association, of which G. H. Rheims is temporary secretary, and an effort is being made to enlist twenty or thirty more automobile importers in the cause.

"We have not united to fight the Licensed Association," said Percy Owen, of Bianchi fame, to THE AUTOMOBILE representative. "Our aims are to unite all importers, irrespective of their connection or otherwise with the Seldenites, in an association which will have for its main object the promotion of the interests of importers of foreign machines. Most of the daily papers and a section of the technical press has made capital of the statement that we are to fight the Licensed body; such is absolutely incorrect."

An interview with G. H. Rheims, of the C. G. V. firm, brought forth the statement that the new society had been called into existence primarily because of the changed dates for the New York independent and licensed shows. No European models will be available for show purposes until immediately after the Paris Salon, which closes its doors December 1. New York importers will thus be effectively debarred from exhibiting their 1908 wares at the coming shows as if Maxim guns were across their path.

"We shall be obliged to hold a separate show," said Mr. Rheims, "some time after the two regular New York exhibits. Particulars are not yet available, but with such firms as Panhard, Renault, Westinghouse, Mercedes, Delaunay-Belleville, Mors, Bianchi and C. G. V., as well as the probability of the remainder of the importers joining in, there is every ground to believe that we shall have a successful show. I do not believe, either, that the holding of our exhibit after the regular shows will affect our sales."

"As a compensation for being debarred from the Madison Square show," said Secretary Butler, of the A. C. A., "the A. L. A. M. has granted the use of the Madison Square Garden from December 28 to January 4 for the holding of a show of licensed and unlicensed importers."

It appears that the conditions on which the use of the Garden is granted is that the exhibitors in the Importers' Show shall not take part in any other automobile exhibition in New York.

In reply to a query on this point, Mr. Butler declared that he did not think any of the firms would agree to such a restriction. "The date, too," he continued, "is far from being satisfactory, and it is not at all certain that the Importers' Society will accept the Garden under such conditions."

AMERICAN CAR FOR HERKOMER TOUR.

The Herkomer list has closed with a total of 170 entries, ten more than last year. America will be represented by a Rambler car to be driven by Carl Hirsch, a publisher and sportsman of Constad, Baden, Germany. Mr. Hirsch was in Chicago recently and made arrangement for the shipment of a 40-horsepower, 4-cylinder touring car from the Kenosha factory of the Thomas B. Jeffery Company. Late entries are received on payment of double fees until May 15. England only sends four cars into the fray this season, instead of the stately list last year; two are Napiers of six cylinders, one to be driven by Miss Leavitt, the other by Cecil Edge; the third car is Robertson Grant's Argyll, and the fourth Director Loeser's Belsize. France is represented by a Renault, a Mercedes, a Berliet and a De Dietrich; Italy only by an Isotta Fraschini, although entries comprising cars of all makes have been received from Germany itself. The Dutch entries are somewhat amusing, two Mercedes and an Adler. Both Herr Ladenburg and Dr. Stoess, winners of the contest last year, are also down to participate, and at the present writing they complete the list. Whether there will be any important additions between now and May 15 at the increased fee is problematical.

A. C. A. TO HOLD A SEALED BONNET TEST.

Beginning June 19 next, the Automobile Club of America will undertake a four days' test open to all listed cars, whether of domestic or foreign make. It is to be known as a "sealed bonnet" contest—a title that speaks for itself. But in addition to sealing the bonnets of the cars preparatory to the start, the transmission cases, coil boxes and sundry other parts will also be sealed, and no adjustments, repairs or replacements of any kind other than tires will be permitted during the course of the contest. There will be no restriction on either the fuel or water supply. The total distance is to be 600 miles for all cars except runabouts in Class A, for which the distance will be 700 miles, to be covered in daily stretches of 150 and 175 miles respectively. Each entrant will be required to furnish a competent technical observer who will be assigned to a car other than that of the entrant, and the assignments of observers will be changed each day. The prizes are to consist of silver cups to be awarded to the winners in each class, in addition to which certificates of performance will be awarded to those who desire them.

The classification is as follows:

Class A. Stock cars complete without tops listed at \$3,000 and over.

Class B. Stock cars complete without tops listed at \$1,500 and less than \$3,000.

Class C. Stock cars complete without tops listed at \$1,500 and under.

Cars in class A must make a minimum average speed of 18 miles an hour; in class B an average speed of 16 miles an hour, and in class C of 14 miles an hour; runabouts in class B being required to make the same average as touring cars in class A, or 18 miles an hour. Cars violating legal speed limits will be disqualified. Each car must be equipped with an odometer and must be placed in the custody of the committee in the club garage every evening and at which the start and finish will take place each day.

YALE'S AUTO CLUB HAS A MEET.

NEW HAVEN, CONN., April 29.—The first racing meet of the newly organized Yale Automobile Club was held April 27, at the Branford Driving Track. The feature of the meet was the performance of a 35-horsepower Oldsmobile roadster driven by William Folberth, an expert driver from the factory. Over 75 cars were present at the grounds, while the attendance was over 1,000. One of the features of the meet which created unbounded amusement was the "Beerobstacle races," in which the occupants of the cars dismounted at the end of each lap and each drank a stein of beer, re-entered the cars and repeated the performance for three laps.

In the finals of the three-mile open championship between a Stoddard-Dayton, L. C. Phipps, '07, driver, and the Oldsmobile, Folberth, driver, the Olds won in 4:45 2-5.

The race for the college championship between L. C. Phipps in a Stoddard-Dayton and G. H. Townsend in a Thomas was won by Phipps; time, 4:53 3-5.

Following the races the members of the club were banqueted in the Branford Casino, where plans were laid for a hill climbing contest to be held in May.

WILL DEMONSTRATE FOR THE DOCTORS.

ROCKFORD, ILL., April 29.—The great advantage of automobiles for the use of physicians is to have an unusual demonstration in this city next month on the occasion of the meeting here of the Illinois State Medical Association. The local auto agents have arranged to have a large variety of machines suitable for doctors' use, and their utility and capacity for time making, hill climbing and in traveling over all kinds of roads will be demonstrated. It is expected that 1,500 doctors will be in attendance at the meeting and will witness the auto tests. The country doctors rapidly are taking to the use of the machines.

RULES FOR THAT STOCK CAR RACE.

INDIANAPOLIS, IND., April 29.—The technical members of the Racing Board of the American Automobile Association met with a number of Western automobile engineers of prominence in this city last week. At the meeting steps were taken preliminary to drafting a set of rules intended to govern a race for stock touring cars which will be held some time after the Vanderbilt race. That little was accomplished at the meeting was due to the fact that Edgar Apperson, of Kokomo, one of the leading members at the conference, was taken suddenly ill. This caused an adjournment, and a meeting will be held in Chicago next week.

Only a few minor details were taken up and nothing definite was decided upon. The question as to whether or not foreign cars will be allowed to compete is one of the most important to be settled. It is understood that a number are in favor of foreign cars competing.

Henry Ford, who drove to Indianapolis in a Ford runabout from Detroit through rain and mud; E. R. Thomas, of Buffalo; and A. L. Riker, of Bridgeport, Conn., were the representatives of the A. A. A. at the meeting, while H. O. Smith and G. A. Weidley, of the Premier Motor Manufacturing Company; Elmer and Edgar Apperson, of the Apperson Automobile Company, and N. H. Van Sicklen, of Chicago, were others present at the conference.

It is expected that a large number of six-cylinder cars will be entered in the competition and these will be given special consideration in the plans. It is generally understood that a large number of Western manufacturers are intending to bring out six-cylinder cars for next season.

NEWS FROM THE INDEFATIGABLE MORGAN.

W. J. Morgan, writing from Jacksonville, Fla., denies the printed report that the Ormond-Daytona beach was ruined by a recent big storm. The Senator states that while the storm took away all the telephone poles and mile posts, and also the piers at Seabreeze and the small grandstand in front of the F. E. C. A. A. clubhouse, the beach itself came through the ordeal in fine shape.

Concerning the road from Jacksonville to the ocean, Mr. Morgan says: "The road will be built at once, and so confident was I of its worth that I agreed to build the highway for the tollgate privileges and sell it to the county at the end of five years at its first cost. However, the tollgate proposition did not meet with favor, and the County Commissioners are going to do the building and make it a free road. It will be at least 20 feet wide all the way to Atlantic-Pablo beach, some 20 miles, when it will then be possible to have a natural ocean boulevard of 60 miles or more, running direct to the North River, near St. Augustine, which either will be bridged or boat service provided by the time the road is constructed. An annual tournament may take place on the Atlantic-Pablo beach."

Mr. Morgan has gone to Galveston, Tex., to meet the Galveston Automobile and Business Men's League, inspect the beach at that place, and talk over the possibilities of a race meet next year.

OLDFIELD DID NOT BREAK TRACK RECORD.

Barney Oldfield's mile in :51 4-5, made recently on the Lakeside track near San Diego, Cal., was accomplished on a two-mile circuit, thereby placing it in the same class with Webb Jay's White steamer mile of :48 4-5, made at the Morris Park track, New York City, July 4, 1905. It will be remembered that the Morris Park track was 1.39 miles, the starting point for the mile being on the backstretch, and thus making only one turn necessary in reaching the finish wire. The Lakeside track is specially constructed for automobiling, and Oldfield believes that he will be able to drive his Peerless Green Dragon a mile in :46. The one-mile circular track record still remains at :53, held jointly by Oldfield and Walter Christie, the former having made his mark at Los Angeles, Cal., and the latter on the Empire City track, Yonkers, N. Y.

FIAT AMONG LATE ENTRANTS FOR GRAND PRIX

PARIS, April 22.—When Walter Christie cabled at the eleventh hour the entry of his front-drive car in the Grand Prix, the automobile world was convinced that no further entry fee would pass into the hands of the Sporting Commission. Automobile firms are human and are no more given to paying two thousand dollars where one thousand will do than the rest of us. There was thus a commotion in the upper room, where the business in connection with the Grand Prix is transacted, when, a few hours before the final closing of engagements at double fees, Emile Lamberjack walked in with a check for six thousand dollars as entry fee for three Fiat racers. A couple of months ago a formal declaration went forth from the Italian factories that neither Fiat nor Itala would participate in the French annual race. No reason was given, though it was generally rumored that there was dissatisfaction with the new conditions. France was disappointed, for the abstention of two of her most formidable rivals robbed the race of much of its interest. Emile Lamberjack was still more disappointed, for he looked upon the abstention as an acknowledgment of defeat. After a little hesitation he resolved on a bold course. At his own expense he ordered three racers to be built, commanded absolute secrecy, and at the last moment walked into the Automobile Club of France and paid over the double entry fee. The engagement has caused a sensation and created satisfaction all round, for such an entry adds considerably to the interest of the race.

But Fiat is not the only late comer. At 6 o'clock, within a few minutes of the closing of the books, Gustave Gobron crossed over the Place de la Concorde, mounted to the first floor of the club and handed to Secretary Sautin an engagement for one Gobron machine and a check for two thousand dollars in due and proper form. Within an hour the Grand Prix fees had mounted from \$34,000 to \$42,000, and the list of entries had gone up from 34 to 38. Although causing less sensation, the Gobron entry was as great a surprise as that of Fiat. Lancia, Nazzaro and Weilschott will, as last year, be in charge of the Fiat racers. The final list for the Grand Prix, no further additions now being possible, is as follows:

France, 24 machines, consisting of 3 Bayard-Clément, 3 Darracq, 3 Motobloc, 1 Corre, 3 Panhard-Levassor, 3 Renault Frères, 3 Lorraine-Dietrich, 1 Porthos, 3 Brasier, 1 Gobron.

Germany, 3 Mercedes.

Italy, 5 machines, consisting of 1 Marchand, 1 Aquila Italiana, 3 Fiat.

Belgium, 3 Germain.

England, 2 Weigel.

America, 1 Christie.

Forty-seven machines will rush round the Dieppe course on July 2, for in addition to the 38 Grand Prix racers there are nine smaller racers engaged in the Sporting Commission cup, seven of them being French and two Italian. Only three firms have entered for the tire competition run in connection with the race, but five other tire firms have engaged stands on the course, without taking any part in the competition. To distinguish between those tires taking part in the competition and those which are not, the former will be painted a bright yellow.

Lancia, Now Lucky, Will Set the Pace.

The wheel of fortune has at last favored Lancia. When lots were drawn to-day at the A. C. F. for starting positions in the race it was Lancia, the man whose engagement was sent in at the last possible moment, who was given number one, and with it the right to rush round the Dieppe circuit at 6 A. M. on the morning of July 2 with no one to hinder him or to stay his wild course. Number one is always looked upon as a position of honor, and there is no doubt that Lancia will take full advantage to be derived from a clear course on the initial round. D'Hespel,

on a Corre, takes second place, starting one minute after Lancia, and at 6.2 Wagner, the Vanderbilt champion, will rush over the line on his little Darracq, bearing number 3, which last year was carried to victory by Sisz on a Renault. This year Sisz starts ninth. Walter Christie has drawn twelfth position, and just behind him will be dare-devil Jenatzy with 13, of doubtful omen. Brasier has fared badly in the drawing, for his first machine starts seventeenth and his third one closes the procession.

An Original System of Numbering the Racers.

A new system of numbering the cars has been adopted this year. The cars are given a team letter and numbered one, two, or three according to the position they occupy on the starting list. Thus the Fiat team letter is F, and Lancia, the first starter, takes F 1. Darracq team letter is D, Wagner carrying D 1, Hanriot D 2, and Demogeot D 3. Walter Christie carries W C 1. There are thus seventeen machines with a team letter or combination of letters and number 1, eleven with figure 2, and ten with figure 3. This method of numbering has met with some criticism on the ground that it does not indicate the order in which the machines started. George Prade, the iconoclast editor, declares that it is a ridiculous arrangement, and that the only sensible plan would have been to number the machines from 1 to 38 and give a distinctive color or combination of colors for each team.

The following is the order of starting in the Grand Prix, the first machine being sent away at 6 A. M., the others leaving at intervals of one minute:

- | | |
|--------------------------------|--------------------------------|
| 1. Fiat, Lancia .....F 1 | 19. Darracq, Hanriot.....D 2 |
| 2. Corre, d'Hespel .....C 1 | 20. Dietrich, Rougier.....L 2 |
| 3. Darracq, Wagner.....D 1 | 21. Bayard-Clément, |
| 4. Dietrich, Duray.....L 1 | Garcet .....BC 2 |
| 5. Porthos, Stricker.....P 1 | 22. Motobloc .....MB 2 |
| 6. Dufaux-Marchand, | 23. Renault, Edmond.....R 2 |
| F. Dufaux .....DM 1 | 24. Germain, Degrais .....GE 2 |
| 7. Bayard-Clément, | 25. Panhard, Heath .....PL 2 |
| Albert Clément .....BC 1 | 26. Mercedes, Werner.....M 2 |
| 8. Motobloc .....MB 1 | 27. Weigel, Weigel.....W 2 |
| 9. Renault, Sisz .....R 1 | 28. Brasier, Baras .....B 2 |
| 10. Germain, Perpère.....GE 1 | 29. Fiat, Weilschott.....F 3 |
| 11. Panhard, Le Blon....PL 1 | 30. Darracq, Demogeot....D 3 |
| 12. Christie, | 31. Dietrich, Gabriel .....L 3 |
| Walter Christie....WC 1 | 32. Bayard-Clément |
| 13. Mercedes, Jenatzy .....M 1 | Gauderman .....BC 3 |
| 14. Weigel, Lee Guinness..W 1 | 33. Motobloc .....MB 3 |
| 15. Gobron .....GB 1 | 34. Renault, Richez .....R 3 |
| 16. Aquila Italiana, | 35. Germain, Roch Brault..GE 3 |
| Richat .....A 1 | 36. Panhard, Dutemple...PL 3 |
| 17. Brasier, Barillier.....B 1 | 37. Mercedes, Willy Poegé..M 3 |
| 18. Fiat, Nazzaro.....F 2 | 38. Brasier, Bablot.....B 3 |

Starts will be made on the loop track, and not on the main course, the seventeen machines bearing number one being brought out at once and drawn up in Indian file, the second series with number two coming out later, and finally the third series. By this means the main track will be perfectly free. The racers engaged in the Sporting Commission Cup will be started two or three hours later, at intervals yet to be decided upon and in the following order:

- | |
|--|
| 1. Gillet-Forest, De la Touloubre.....GF 1 |
| 2. Darracq, Cafflois .....D 1 |
| 3. H. I. S. A., Moulin.....H 1 |
| 4. La Bulre, P. Dumaine.....LB 1 |
| 5. Porthos .....P 1 |
| 6. Darracq .....D 2 |
| 7. H. I. S. A., Baron de Caters.....H 2 |
| 8. La Bulre, Mottard.....LB 2 |
| 9. La Bulre, Dessalagne .....LB 3 |

Official numbers must be immediately painted on the machines in either black on white or white on black. Elaborate precautions are being made to prevent violation of the rules. The night before the race the machines will be given their allowance of gasoline, the tank being filled and the surplus put into cans and

sealed. Each machine will be locked in a separate box and guarded all night by a commissaire. If the driver expresses a desire for a small quantity of gasoline to start the motor a quarter of a liter will be drawn from the tank and given to him separately. There will be a separate tire and gasoline station for each machine, and not for each firm, as last year, everything allowed by the rules being obtainable at the grand stand stations, and tires only at the second station, half way round the course. Eighty inspectors, or more than one per kilometer, will be stationed round the course to observe that no aid is given to the machines, and especially that they do not obtain gasoline from outside sources. As last year, all work on the racers, from the moment the start is given to the time when the contest is called off, must be performed by the driver and his mechanic only. At the second tire station the tires will be hung up on the outside of the barricade separating the stations from the course. Drivers will hastily grab new tires as they slow down for a second, throwing the old ones over the barrier.

Official measurement of the course shows that the total distance round is 47.8 miles; ten rounds will be covered in the Grand Prix, giving a total distance of 478.3 miles. Sporting Commission Cup racers will only cover six rounds, giving a total of 287 miles.

Britain's King May Go to the Races.

Hopes are high of King Edward witnessing the Grand Prix. Rumors have been afloat for some time that the King of England had considered the question and that a favorable decision was likely. Last week the sub-prefect of Dieppe and the mayor of the town left for London to use their influence in obtaining the presence of the British sovereign at the race and at the same time to make arrangements for the motor boat race across the channel from Newhaven to Dieppe, to be held in conjunction with the Grand Prix. Natives of the district are dissatisfied with the decision of the Automobile Club of France to open a large camping ground in the vicinity of the course, and declare that if this intention is persisted in they will withhold their subscriptions to the club. As the Dieppe district is contributing \$20,000 to the funds of the A. C. F., this body is obliged to pay some attention to the wishes of the inhabitants. Nothing has yet been officially announced regarding their reply to the anti-campers.

CHRISTIE RACER IS BEING TRIED OUT.

Walter Christie's Grand Prix racer made its first run on a quiet road near the factory this week. Excepting a leaky radiator, and a few details of little importance the test was most satisfactory, the machine showing remarkable speed and giving all that was expected of her from her builder. Walter Christie declares that a few slight alterations will be made and that the end of this week he will leave New York for a fortnight's thorough testing. It has been decided to use Diamond tires.

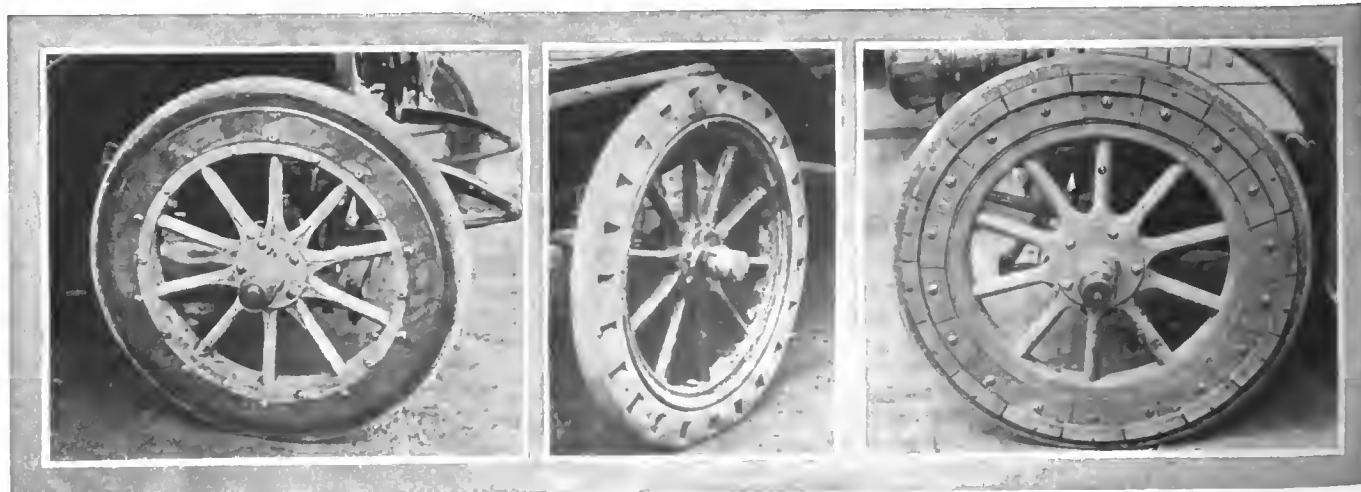
FRENCH SPRING WHEEL TEST.

PARIS, April 23.—There appears to be more interest on the part of the automobile public in the spring wheel problem than among wheel makers and inventors. Last year, when an exhibition and competition was organized in Paris for any type of wheel other than pneumatic, eleven machines were assembled, and three fulfilled all the demands of the test. This year there are thirteen starters, employing seven different systems, a smaller number than in the previous contest, only three of them being of recent origin. The test consists of a run from Paris to Marseilles and back, in four outward and four homeward stages, at an average speed of forty kilometers an hour. Repairs may be done on the wheels if necessary, but as there is an ever-watchful commissioner from a rival firm on board, who is enjoined to make a careful note of such attentions and report them to the jury appointed to examine the wheels on their return to the capital, drivers keep their fingers off as much as possible. The total distance to Marseilles and back is 1,300 miles, giving a daily average of 150 miles.

The competitors consisted of one Soleil, three Ducasble, three Elastes, two Edmond Levi, one Securitas, one Cosset, and one Sider. Securitas, Ducasble, Cosset and Elastes are, if not entirely new, at least newcomers in competitions of this nature. Elastes has come into general use during the past year, more especially on horse and gasoline cabs. Externally, the wheel does not differ from the ordinary type of pneumatic tire. Instead of being filled with air, however, there is an inner tube of rubbery composition made largely of glue, glycerine and chromatic salts. The outer shoe is forced on over this ring of composition. On the Securitas wheel a number of rubber balls of varying diameter and resistance, according to the nature of the car on which it will be used, are placed between the felloe and the outer rim. These balls are lodged in a chamber formed by the rim of the wheel, two steel beads solidly attached to the rim, and a strong steel collar holding the rubber bandage coming in contact with the road. This outer steel rim is of I-section, the two projections fitting into grooves on the felloe, and having a sliding movement. The rubber balls between the two give the necessary resiliency. There is a special arrangement to prevent the outer rim revolving on the inner, though not of a nature to prevent it being compressed.

Ducasble is a cushion tire with a number of independent air chambers, each of which has an air hole, out of which the air is forced when that part of the tire is compressed, and through which fresh air is drawn when pressure is released.

The Sider wheel consists of a shoe similar in external appearance to an ordinary pneumatic shoe, with a number of thin steel bands placed transversely to the rim, superimposed, but separated by layers of canvas. It forms a semi-metallic tissue, the springs forming the web and being united by a chain.



SECURITAS SPRING WHEEL.

THE DUCASBLE.

INVENTOR COSSET'S WHEEL.

MASSACHUSETTS REGISTRATIONS.

BOSTON, April 29.—Automobile registration in Massachusetts has shown a steady gain this spring, and for the first four months of the current year the registration with the highway commissioners is more than 300 cars ahead of the same months last year. Since the first of January there have been registered approximately 2,100 machines, against 1719 for the first four months of 1906. The number of licenses to operate, however, have not increased proportionately, indicating that not as many new owners are registered as last year. Since the first of last January there have been issued 824 ordinary operators' licenses, against 956 for the first four months of last year, and the registration of motorcycles remains about the same. There have been only 27 new manufacturers and dealers registered so far this year, against 58 for the corresponding time a year ago.

No Board of Examiners in Massachusetts.

The Committee on Roads and Bridges of the Legislature this week reported unfavorably on the recommendations of Governor Guild in his inaugural address. These were that a board of expert examiners be established to pass upon the applications of chauffeurs for licenses, and that a statute be passed giving pedestrians and horse-drawn vehicles the right of way over automobiles on the highways of the State. The report on both these recommendations was, "no legislation necessary." The highway commission already has sufficient power, if it wishes, to put applicants for chauffeurs' licenses through any sort of a reasonable test it may devise.

An Annual Registration, but Amount Undetermined.

The only legislative matter that is still unsettled is the bill to increase the fee for registration. As originally proposed this bill provided for a sliding scale of fees from \$5 to \$15 for pleasure cars based on horsepower. That feature of the bill, it is said, has been abandoned by the committee, and it has practically been decided to report a measure providing for a flat annual registration fee, the same for all sorts of pleasure motor vehicles. What the sum will be has not been settled, but it is stated that a majority of the committee favors a \$5 annual fee. This would provide approximately \$60,000, which is \$10,000 more than the amount which the highway commission estimates is necessary to make repairs on the highways of damage caused by automobiles.

WHAT'S DOING IN AUTO LEGISLATION.

MADISON, WIS., April 29.—All automobile bills have been practically killed. James T. Drought, of the Milwaukee Automobile Club, was exceedingly active in heading off unfavorable legislation and deserves great credit for his efforts.

ST. PAUL, MINN., April 29.—The State Senate has passed Senator Nelson's automobile bill after amending it so as to make the maximum speed in cities 15 miles per hour instead of 8.

LANSING, MICH., April 29.—The Secretary of State's office wants to inaugurate a new system of registering automobiles, compelling a comprehensive certificate to be issued for each machine, the original to cost \$5 and \$2.50 for a yearly renewal. There is also a provision for registering chauffeurs annually and providing them with badges at no additional cost, but their competency must be vouched for by two reliable persons.

PENNSYLVANIA REFUSES TO BE PROGRESSIVE.

PHILADELPHIA, April 29.—The Pennsylvania Constitution will not be amended in the interest of good roads. The bill to borrow \$25,000,000 to be devoted to the improvement of the roads of the State fell by the wayside last Wednesday when, by a vote of 91 yeas to 68 nays, it failed by reason of the two-thirds provision required for the passage of Constitutional amendments. The facts that the State has a big balance in the treasury and that several millions "graft" was gathered in on the new capitol without materially flattening the Commonwealth's pocketbook, were responsible for the failure.

BOSTON FIRE CHIEF'S STEAMER.

BOSTON, April 29.—Another important addition to the automobile corps of the Boston fire department is the steam car designed by Louis S. Ross and built in his factory at Newtonville, especially for the use of Chief Mullen of the department. Ross, besides being one of the best-known drivers of steam cars in the world, is also a fire crank, and for some time he has been endeavoring to construct an automobile for fire work. He finally interested Commissioner Wells, of the Boston department, and secured the order. The car in general appearance is a tourer, but it cost to build considerable more than Ross charges for his stock tourer, and in every part has been designed for fast and hard work. The frame, axles, springs and driving parts are all heavier than in the ordinary car, and the boiler, of the fire tube pattern, is 26 inches in diameter, while the two-cylinder vertical engine, it is claimed, will generate 75 horsepower and give a speed of 50 miles an hour. Such a speed has already been attained in trial runs and the car has climbed Parker hill, the worst grade in the city.

To protect the car from damage there is a bumper in front, and the car is equipped throughout with Kilgore shock absorbers. In the rear is a patent leather trunk in which are carried the coats of the chief and his aide, Lieutenant Webber, who has charge of



ROSS STEAM CAR BUILT FOR BOSTON FIRE CHIEF.

Chief Mullen in uniform and Fire Commissioner Wells in the rear seat; Lieutenant Webber, aid to the chief, and Charles Cosgrove in front seat.

the car. Under the rear seat are special compartments for the fire hats and rubber boots of the occupants of the machine. A speedometer, water, gasoline, air and steam gauges are placed on the dash, where there is also a special cut-out so that when the car is left alone at a fire it cannot be harmed by anyone who attempts to meddle with the machinery.

Both boiler and engine are carried under the hood, and Mr. Ross has exercised his ingenuity to a remarkable degree in providing arrangements by which every sort of a breakdown can be avoided. He has an arrangement, for instance, by which if the superheater is damaged wet steam can be used and every part is so made as to be quickly interchangeable. Under the front seat is a 40-gallon water tank, while in the rear is a 30-gallon gasoline tank. The air pressure is maintained mechanically and there is also an auxiliary air tank so that there is never danger of trouble from lack of air pressure. When the car is not in use the steam pressure is maintained by the pilot light, which always keeps up a sufficient head of steam to start the car at 25 miles an hour, and it is claimed by Lieutenant Webber that while the chief is getting on his coat he can have the car ready for a dash to the furthest section of the city at highest speed. The pilot light costs about 15 cents a day in gasoline.

A garage and repair shop has been opened at Brattleboro, Vt., by the E. R. Clark Automobile Company, of Springfield, Mass. The equipment is modern and complete.

A MERGER INVOLVING TIRE INDUSTRY.

There is a possibility of the affiliation of the United States Rubber Company with the Continental Rubber Company, which, if brought about, will unite the largest manufacturing and the largest rubber controlling bodies in one corporation.

Inquiries at the headquarters of the United States Rubber Company were met with the information that the merger was under consideration, and that an examination of the affairs of the numerous bodies affiliated with or controlled by the United States Rubber Company was being carried out. No definite action has yet been taken, and it is not likely that any definite move will be made for several months.

The amalgamation is of interest to the automobile industry from the fact that the United States Rubber Company controls some of the most important tire manufacturing concerns in this country.

The Continental Rubber Company holds the largest concessions of raw material in the world, some of which, in Mexico and on the Congo, have never been exploited. "Should the amalgamation be consummated, it will result in a reduction in the price of manufactured goods," declared the official of the United States Rubber Company.

A Rubber Affiliation Just Announced.

INDIANAPOLIS, April 29.—Charles H. Dale, president of the Rubber Goods Manufacturing Company, makes the first official announcement in his annual report of the affiliation between the Rubber Goods Manufacturing Company and the United States Rubber Company, which it is understood was brought about a few months ago.

The Rubber Goods Manufacturing Company is an organization of several manufacturers of rubber tires, including the G & J plant in this city, while the United States Rubber Company is composed of manufacturers of rubber boots and similar articles. It is said in the report that the affiliation of the two associations has resulted in considerable good to each, including better facilities for the purchase of crude material.

NASHVILLE, TENN., TRIES THE SHOW IDEA.

NASHVILLE, TENN., April 27.—A decisive impetus was given to automobile interests in Nashville this week, when, in connection with and as a feature of the Spring Festival, under the auspices of the Board of Trade, the automobile dealers and manufacturers' agents arranged an exhibit of cars. The garage of the Southern Automobile Agency was selected, and many examined the eleven makes of cars shown. The garage was beautified with palms and flowers.

A car that attracted much attention was the White steamer eight-passenger limousine. This car is the only one of its kind in the State, and was sold to W. J. Oliver, Knoxville, who will be remembered as the lowest bidder on the Panama Canal contract. Another car that called for admiration was the Dorris car, built by Preston Dorris, an old Nashville boy. Duncan R. Dorris, a brother of Preston Dorris, and manager of the Nashville Motor Car Company, himself personally demonstrated this car.

AN AUTOMOBILE SHOW IN DARKEST RUSSIA.

It seems that 1907 will go down into history as the year in which every country but Liberia and the Congo Free State held an automobile show. Spain makes her debut in this field this month, and now Russia has vitalized a project to do likewise. Consul-General Watts, at St. Petersburg, forwards a letter to the department from the chairman of the executive committee of the Automobile Club of Russia, requesting him to make known in the United States the regulations of the first international motor-car exhibition, to be held from June 1 to 17 under its auspices. The Russian Government has already granted special railway rates for all exhibits. The complete regulations, printed in French, are on file at the Bureau of Manufactures, where they are available to the trade.

FIRST AMERICAN AEROPLANE CONTEST.

Rules governing the competition for the *Scientific American* flying machine trophy, drawn up by a special committee of the Aero Club of America, stipulate that the competition shall be open to all nations, that it shall be held annually, and that the first contest shall be at the Jamestown exhibition on September 14, 1907. Entries are received at the Aero Club of America prior to September 1. Heavier-than-air machines of any type whatever are eligible for the competition, the trophy going to the one covering a distance of one kilometer in the shortest time and with the best display of stability and ease of control. The flights shall be made in calm air if possible, the start being made against the wind. If the trophy is won by the representative of a foreign aeronautical club, this club may become the custodian of the trophy, but all competitions, even if held abroad, must be carried out under the rules used by the Aero Club of America in the competition held here.

M. CHARRON WEDS CLÉMENTS DAUGHTER.

PARIS, April 22.—It was a strictly automobile gathering that assembled at the *mairie* of Neuilly-sur-Seine to celebrate the marriage of Ferdinand Charron, winner in the first Gordon Bennett Cup contest and the head of the firm of C. G. V., with Mademoiselle Jeanne Clément, daughter of M. Clément, founder of the Bayard-Clément firm. Ferdinand Charron, in addition to being one of the most important business men in the Paris automobile world, is an all-round sportsman, has been successful in bicycle and automobile contests, and lately has ridden his own horses to victory in races at Longchamps against the most experienced European jockeys. The brilliant ceremony was attended by representatives from nearly all the important French automobile firms, among the guests being Marquis de Dion, Louis Renault, René de Knyff and Dominique Lamberjack. The entire wedding party arrived in C. G. V. and Bayard-Clément automobiles.

NO HOPE FOR ITALY IN THE AERO CUP RACE.

PARIS, April 23.—All hope of Italian participation in the Gordon Bennett balloon contest at St. Louis on October 19 is at an end as the result of a recent decision of the International Aeronautical Federation. It will be remembered that Italy sent in an entry for the race several weeks after the official date of closing, and that their engagement was refused. A special appeal was made to the International Federation, which is alone authorized to judge in such a matter, on the ground that unforeseen circumstances had prevented the entry being sent in according to regulations. After due consideration the Federation declared that they regretted that they were obliged to apply the rules rigorously, and must in consequence refuse the Italian entry.

LIEUTENANT LAHM ILL WITH TYPHOID.

According to despatches from France, Lieutenant Frank P. Lahm, who is undergoing a course of special training at the French military cavalry school at Saumur, is ill with typhoid fever. Lieutenant Lahm was selected, with J. C. McCoy and Alan R. Hawley, to represent the United States in the balloon race for the Bennett Cup from St. Louis next October. Should he not be able to take part in this contest as the result of the illness, his place will be taken by one of the three substitutes yet to be named by the Aero Club of America.

AN AIRSHIP WHICH CARRIES TEN.

A cable despatch from Paris announces that a giant aerostat named the *Eagle*, with a capacity of 4,150 cubic meters, made a successful ascent from the grounds of the Aero Club at Saint-Cloud. There were ten of the best aeronauts of Paris in the car, among them being Santos-Dumont. The balloon vanished to the southwest before a fair breeze. M. Bahan, vice-president of the Aero Club of France, is the owner of the *Eagle*.

FRANKLIN MOTOR HAS INDOOR TEST.

Just to demonstrate that the Franklin air-cooled motor was everything that its name would indicate, the New York City agents, Wyckoff, Church & Partridge, mounted a complete 12-horsepower Franklin car on stilts at their establishment at Fifty-sixth street and Broadway last week and set it going in the presence of a number of technical men and newspaper representatives. It was started at 3 p.m. Wednesday afternoon by E. L. Ferguson, chairman of the technical committee of the New York Motor Club, who thereupon sealed the carbureter and ignition adjustments so that they could not be tampered with in any way, thus making the test particularly severe as the motor could not be "nursed" in any way to keep it going. The sealing was attested to by a committee composed of Mr. Ferguson, Sam Butler of the Automobile Club of America, and Alex Schwalbach of the Long Island Automobile Club. The observation committee consisted of Al Reeves, manager of the A. M. C. M. A., Fred Wagner and D. A. Ward. The motor was run at 400 r. p. m.—an equivalent of 9 miles an hour—without a fan and in the closed salesroom, thus depriving it of the most efficient of cooling factors, convection. It continued to run for 44 hours, which was equivalent to 540 miles, without other attention than a supply of gasoline and oil, at the end of which period it was stopped purposely. Wyckoff, Church & Partridge tried the Franklin motor beforehand, and had had it running steadily night and day since the previous Friday. It was simply stopped for a short time on Wednesday to go through the formality of sealing, so that when it was finally stopped it had been running a whole week in a closed room—something that speaks well for the Franklin auxiliary exhaust, which made the feat possible. The exhaust gases were piped out of the room.

EXPORTS BEGIN TO DOUBLE ANNUALLY.

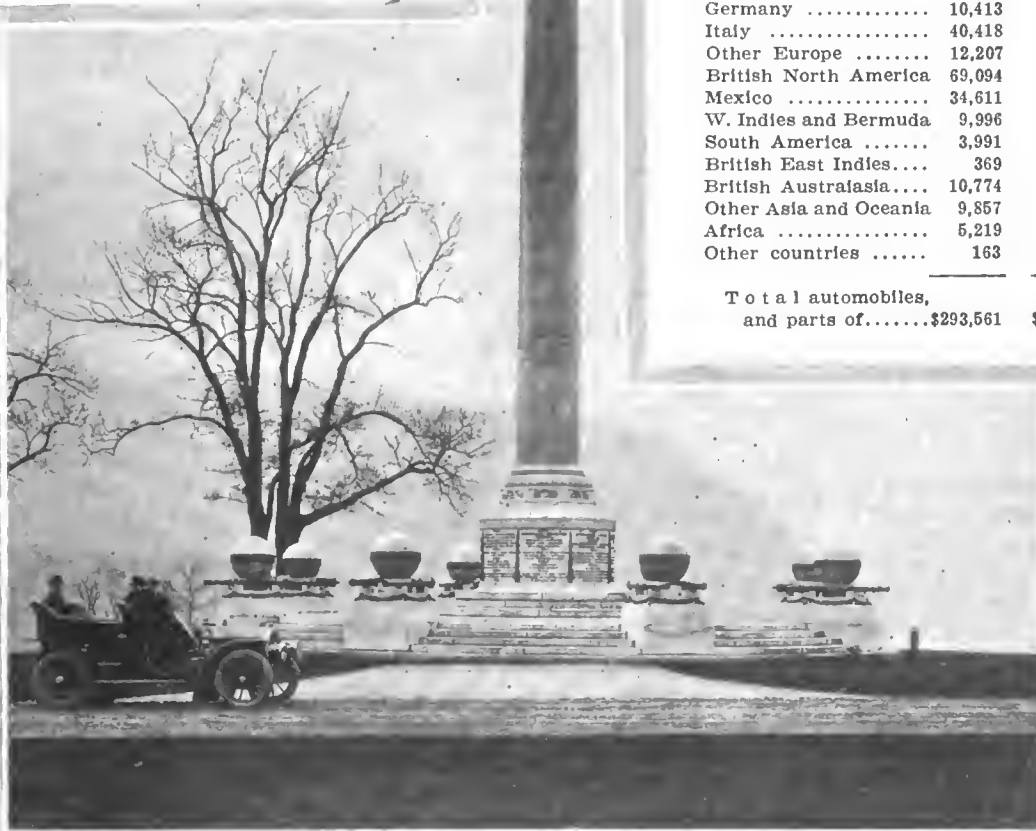
While it is to be regretted that no statistics of automobile production are kept in this country, some idea of the rate at which the annual output is increasing may be had from the export returns. For the month of March, 1907, the total was \$545,347, representing an increase of more than \$250,000 over the same month of but a year ago, when the total was \$293,561. This sum is composed of the value of 307 complete cars, reaching a total of \$493,425, and parts to the extent of \$51,922. And the most striking feature of the report is to be found in the fact that a very large part of the increase is to be found in the returns from automobile-producing countries. The amount sent to Great Britain, for instance, more than doubled in that time, increasing from \$70,414 for March, 1906, to \$146,621 in the present year, while to France it more than trebled, the figures being \$16,035 and \$65,813; to Germany the increase amounted to but \$3,000 in round numbers, though to other Europe there was a jump from \$12,207 to \$59,573. Mexico, British North America and South America also show substantial increases.

During the period of nine months ending with March for three years past the increasing totals tell a similar story. For 1905 this was \$1,638,601; 1906, \$2,064,874, and 1907, \$3,418,593, the last-named total being composed of the value of 1,889 complete cars amounting to \$2,965,284 and \$453,309 worth of parts. The report in detail, showing the increase in March, 1907, as compared with 1906, and for the eight months ending with March in those two years follows. Prior to July, 1905, automobile exports were not considered of sufficient moment to state in detail.

	March 1906	March 1907	Nine Mos. Ending Mar. 1906	Nine Mos. Ending Mar. 1907
Automobiles, and parts of:				
Automobiles. No. 307...	\$293,561	\$493,425	\$2,064,874	\$2,965,284
Parts of		51,922	.....	453,309
Exported to:				
United Kingdom	\$70,414	\$146,621	\$541,431	\$809,644
France	16,035	65,813	139,226	277,418
Germany	10,413	13,701	45,742	85,508
Italy	40,418	27,024	171,628	126,127
Other Europe	12,207	59,573	102,469	166,260
British North America	69,094	124,524	353,717	695,884
Mexico	34,611	66,908	201,121	628,243
W. Indies and Bermuda	9,996	13,391	220,424	171,800
South America	3,991	21,415	62,032	169,056
British East Indies....	369	4,758	28,733	26,088
British Australasia....	10,774	1,265	129,620	185,943
Other Asia and Oceania	9,857	236	40,787	69,712
Africa	5,219	118	26,094	8,673
Other countries	163	...	11,880	8,242
Total automobiles, and parts of.....	\$293,561	\$545,347	\$2,064,874	\$3,418,593

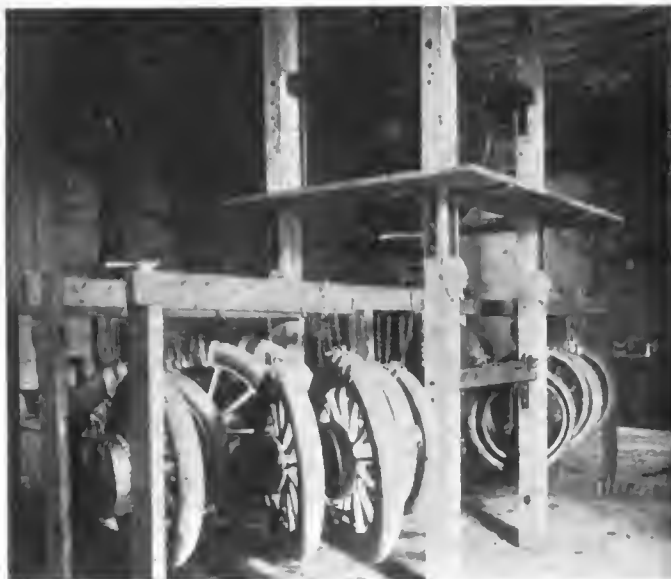
EZRA KIRK.

Ezra E. Kirk, sales manager of the E. R. Thomas Motor Company, Buffalo, N. Y., for the past year and more, has resigned, and his address is now 915 Jefferson avenue, Toledo, O. Mr. Kirk is one of the pioneers of cycling who took to automobiling at its inception and is well known throughout the trade. His plans for the future he is not as yet prepared to announce, but his continuance in the trade is a certainty.



A VISIT TO BATTLE MONUMENT, WEST POINT, IN A PEERLESS.

[The monument is erected to the memory of officers of the United States Army, who have been killed in the service. Battle Mountain is in the background.]



NEWMASTIC WORKSHOP, WITH DEVICE FOR FILLING TIRES.

A SUBSTITUTE FOR AIR IN TIRES.

Substitutes for pneumatic tires have so frequently been introduced that the practical automobilist has ceased to prick up his ears when a new one is brought forth with beating of drums. Some months ago a spongy preparation for filling ordinary pneumatic tires was put on the French market and is at present being used with considerable success, more especially on horse and gasoline cabs. Avoiding details, it consists of a composition composed of glue, glycerine, and chromatic salts, liquefied, poured into the tire and allowed to set. The composition can be made as spongy or as hard as desired, and providing it does not lose its resiliency with use, forms what is claimed to be an excellent substitute for air-filled tires. We have not been able to watch the performance of the French product for long periods, but the extent to which it is being adopted for public vehicles in European capitals would seem to indicate that it satisfies.

It was somewhat of a surprise to discover that a substitute for the pneumatic tire, similar in principle, but improved in detail, to the article employed in Europe, had been manufactured in this country for over four years, considerably antedating the French rival. C. D. Nirdlinger had the honor of inventing a preparation for use in tires, to which he gave the title of Newmastic. For several years he worked in a quiet way, filling tires that were sent to him, established a couple of branches in distant cities, but failed to make his product known outside of a limited circle.

Only a few months ago Nirdlinger's patents were brought to the notice of interested capitalists, and immediately arrangements were made for lifting them out of the rut in which they had for so long been held.

In a store at Sixty-eighth street and Broadway, the Newmastic Tire Company has established its New York headquarters, and it is there that ordinary pneumatic tires for lordly touring machines and humble bikes are transformed from air-filled to Newmastic-filled. On the occasion of the visit of the representative of *THE AUTOMOBILE*, a group of workmen, with the inventor at their head, were just about to operate upon a batch of tires of all sizes and conditions. On a raised platform was a large copper-jacketed vat with a circular gas jet beneath it, in which for several hours a mixture of glue, glycerine and chromatic salts had been gently simmering, all the time stirred up by a revolving paddle within the vat. A glance at the illustration will show the arrangement of the vat.

Two men bearing a can of chemicals in solution mounted a ladder to the upper platform, poured the contents into the vat, and descended. A minute later the paddle was stopped, and a cock opened at the base of the vat, allowing the hot composition

to run out into another tank immediately beneath. From the lower tank a central outlet pipe runs with a number of branch arms, each one fitted with a tap. Over the piping were suspended a number of automobile wheels, fitted with pneumatic tires. They were a motley group; the smallest was for a bicycle, the largest for a big Panhard touring machine. Each one had had its valve drilled out, and was connected up to an arm of the main outlet pipe at the base of tank. A couple of needle valves had been pushed into each tire and were held there by a sleeve. On a given signal the flow of the hot composition was stopped, the inlet closed hermetically and compressed air allowed to enter the lower vat from a huge tank on an elevated platform. A few seconds later air could be heard hissing out of the valves pierced through the tires, and immediately after the grey composition began to issue. A half turn of the needle and the valves were closed, and each man stood with his fingers on the tire awaiting the moment when experience told him that it was necessary to shut off the supply. All that then remained to be done was to disconnect the tire valve from the pipe, take the wheel down, pull out the air plugs, which, being no thicker than a fine pricker, left a hole of no importance, clean off any of the composition which had oozed out about the inlet valve, fix the wheel on the car and go on the way rejoicing.

One of the qualities of this composition is that it sets almost instantly into a springy, rubbery mass, so that there is no delay in changing from air-filled tires to those provided with Newmastic. It is claimed that the composition will not harden with use; that, indeed, its tendency is to get slightly softer as it increases in age. Experiments with the hot flame of a soldering lamp proved conclusively that it could not be melted with heat. A section was placed in the flame for a few seconds; it frizzled, but would not melt, and apparently lost none of its resiliency by the application of the heat.

The first objection made to the preparation would be that of weight. If it were used on a light motorcycle the objection would hold. But if applied to a medium weight touring car or runabout there would be no increase, while if it were a very heavy and powerful machine a gain in weight would be made. Generally the weight of the resilient composition put into the tires is equal to the extra shoe, jack, inner tubes and repair outfit carried on the machine. Weight is taken off the machine and put on the wheels in an ordinary case; there is a distinct saving on the heaviest types of automobiles.

TRYING OUT THE POPE-TRIBUNE RUNABOUT.

CUMBERLAND, Md., April 27.—The hills of Maryland supply excellent trying out territory, and the Pope Manufacturing Company's plant at Hagerstown therefore has an ideal location. H. L. Pope, its general manager; V. M. Palmer, the superintendent, and eighteen others of the Pope staff came to Cumberland with ten 16-20-horsepower Pope-Tribune four-cylinder runabouts recently on a testing trip. At Sideling Hill it was necessary to ford the creek with the water up to the hubs of the cars. The party stopped over night in Cumberland.



POPE-TRIBUNE CAR TESTING PARTY AT CUMBERLAND, MD.

REO SUBMARINE MAKES DEEP SEA RECORD.

When sending a car off on a record-making or breaking trip on the Pacific Coast, there are more things to be thought of than gasoline, oil, tires and spares—many more—and not the least of them is the fact that, owing to the lamentable lack of bridges



H. M. HANSHUE IN HIS REO.

and other signs of civilization, there are apt to be many times when the car will find itself under water. Now the modern automobile, while amphibious to a certain extent, is not a diver, and when the wet begins to rise above the footboards there is usually a muffled sigh and a gurgle that sounds the death knell of the carbureter as well as the ignition system.

But he of the alliterative cognomen—Harris

Hanshue—took this into account when he assayed to do things to the Oakland-Los Angeles record in a Reo. On that stretch of 500 miles there is plenty of water, and lots of it pretty deep at that. He turned his car over to the mercies of L. T. Shettler before starting, and the latter used some garden hose with good effect; in other words, he brought the carbureter air intake and the exhaust above “sea level,” as shown by the protuberance sticking above the car in the accompanying photographs of the exploit. In addition, every part of the car susceptible to moisture was wrapped with tape, shellacked and then wrapped again. As a result, the 500 miles of mud, roughness and deep fords were made in two days and fifty-four minutes, every foot of it being covered by the little Reo under its own power, which is more than a mere record for a two-cylinder car. The time really gives no idea of the pace at which obstacles were overcome, for some seven hours were lost at Tulare by making a roundabout circuit on the wrong road and re-entering the same town that much later. Failure of the acetylene gas at Livermore accounted for more lost time, as in addition to darkness there was also fog.



EXHAUST CARRIED ABOVE SEAT BACKS.

Failure of the acetylene gas at Livermore accounted for more lost time, as in addition to darkness there was also fog.

CORLEW MAY HEAD NEW ENGLAND CONCERN.

Boston, Mass., April 29.—It is rumored that Frank S. Corlew, who organized the Dragon Automobile Company, of Philadelphia, and who lately resigned his position as vice-president and sales manager, has been approached by New England capitalists to head a proposed automobile industry, which, it is understood, will be one of the largest automobile companies in the United States. It is said to be their intention not only to build low-priced pleasure vehicles, but taximeter cabs and light delivery wagons, and the factory to be located in or near Boston. Full details and announcement of the proposed industry is expected to be given out in a short time.

The city hall commission of Newark, N. J., has decided to erect a garage in the rear of the city hall, which will measure 56x96 feet, and be two stories high.

A. M. C. M. A. SECURES REDUCTION IN RATES.

By an extremely illogical interpretation of a rule established by the Pennsylvania ferries before the advent of the automobile, a loaded five-ton truck was ferried for a charge of 90 cents, but one carrying machinery had to pay \$4 a trip. The gasoline-driven commercial vehicle contained machinery, ergo it had to pay the four-dollar rate over that ferry. In construing the rule, the officials never considered whether it meant machinery in or on the truck, and stretched it to cover both. The reason for charging more in the case of a truck loaded with machinery was due to the fact that very heavy pieces were frequently thus carried, and occasioned trouble and delay by being unable to leave at the other end owing to the grade of the bridge at low-tide.

As this was an unjust discrimination against the users of commercial vehicles, the freight committee of the American Motor Car Manufacturers' Association, working in conjunction with J. H. Wood, general manager of the Merchants' Express and Transportation Company, took up the matter with the Pennsylvania Railroad officials, and has succeeded in having the tariff reduced to 38 cents a trip, or, when bought in hundred lots, 30 cents a trip, as obtains on other ferries. When loaded with machinery the usual additional charge will be made.

GIVING INVENTIVE GENIUS ITS JUST DUE.

In the article on “The Importance of Facilities in Touring,” appearing on page 586 of the April 4 issue of THE AUTOMOBILE, Mr. Ellsworth is credited with being the designer of the ingenious arrangement for carrying luggage on a touring car. The honor is due to Dr. Wood McMurtry, an American resident in Paris, who designed this body and put it on the market under the title of “La Routière” touring body. It was Mr. Ellsworth who bought the car from Dr. McMurtry and introduced it into this country.

HAYNES RUNABOUT TO BE 30 INSTEAD OF 50 H.P.

After trying it out very thoroughly, the Haynes Automobile Company, Kokomo, Ind., have concluded not to market a duplicate of the high-speed runabout which was used in the Vanderbilt cup race last, except to order. Instead, they will specialize their 30-horsepower Model S chassis for the same purpose, the 50 having proved to be unnecessarily high-powered for the weight of the car. The new car, which is pictured in the accompanying photograph, is to be termed the Haynes semi-racer. It has practically unlimited speed and climbing power, and, with its great flaring fenders, thoroughly protecting the passengers from flying mud and stones, it is a snappy and serviceable looking car. A rumble seat in the rear is provided on top of the tool box, which is a permanent fixture, beside which there is a rack for a trunk or dress-suit cases. The finish is an attractive gray, set off by black striping.



HAYNES SEMI-RACER RUNABOUT, 30-HORSEPOWER.



FARMER'S AUTO, DESIGNED SPECIALLY FOR RURAL RESIDENTS.

AUTOMOBILES FOR THE AGRICULTURIST.

Though looked down upon with a curious and more or less kindly tolerance by the average autoist, the high-wheeler with its square body and abrupt dash, so closely approximating the ideal of horseless vehicle from which the present type of automobile was evolved, has come to stay. More than that, it represents a factor which, in the course of a few years, is bound to become of great importance. It is not too much to say that with the passing of another decade there will be more of this type by far in the hands of users than any other; they will outnumber the cars whose chief distinguishing features are luxury and speed, many to one. A car such as that shown by the accompanying photograph, is hardly as complicated as much of the present-day agricultural machinery used on large farms, and is, in consequence, not alone readily understood by the farmer and his sons, but by the village blacksmith as well, to whom it is bound to be taken once beyond the province of home repairs.

Its makers, the International Harvester Company, Chicago, Ill., know the farmer's needs and the farmer's limitations—better, probably, than he knows them himself—and have borne them in mind throughout the design of the vehicle, which is appropriately called the Farmer's Auto. It is expressly designed and constructed, not only for the rural highways over which it is to be run, but also for the rural owner who is to run it. The motor is a four-cycle air-cooled engine and is of the horizontal, two-cylinder opposed type. It is located centrally under the body in an accessible position. The cylinders measure 5 by 5 inches bore and stroke respectively, and provide ample power to carry the vehicle over the roughest of roads or steep hills at a speed varying from two to twenty miles an hour. Every part is of the most substantial nature; long pistons and an extra heavy crankshaft supported on liberal-sized bearings distinguishing the engine, while one-piece steel drop forgings form the front and rear axles. The valves are all in separate cages and are easily removable for inspection, while lubrication is automatically taken care of by a 10-feed mechanical force-feed lubricator. High-tension ignition is employed, the coil being mounted on the dash in a dust-proof case. The wheels are of the well-known Sarven type and are 40 inches in diameter on the front and 44 inches on the rear; they are shod with 1 5/8-inch solid rubber side-wire tires. The engine lies parallel with the body and drives by a single chain to a countershaft from which the final drive is taken to the rear wheels by double side-chains. Simplicity and accessibility have been studied and the results applied at every point, as is evident from the fact that the transmission is readily removable from the body for inspection or repair; the friction clutch is very simple and dependable and the differential is placed on the countershaft as is done on the most approved heavy types using a side-chain drive. Bronze and steel gears of substantial proportions are em-

ployed, running in amply large and long bearings, while all parts subjected to severe wear are case-hardened. Double elliptic springs are used both front and rear for the suspension.

It is evident from the illustration that while conforming to the farm standard of simplicity and durability, the matter of outward appearance has not been overlooked. The tilted wheel steer and the single-lever control, as well as the slight backward rake given the high-backed seats, give the car a business-like look that is more often lacking in this type of car than not. The seats are comfortably upholstered and finished with Pantasote, the rear seat being made detachable. The regular equipment consists of a pair of headlights and a taillight as well as a horn; the top is extra.

4,000 MILES, WHITE VS. ROLLS-ROYCE.

LONDON, April 20.—Much talk has been going on recently regarding the gauntlet thrown down by Mr. Frederick Coleman, English representative of the White steam car. There can be no doubt that all who are interested in the progress of the motoring industry will watch the performances which the following acceptance of the challenge will bring forth:

To the Editor of "The Daily Telegraph."

Sir—Referring to Mr. Coleman's challenge regarding a 4,000 miles' trial between a 30-horsepower White steam car and a 40-50-horsepower six-cylinder Rolls-Royce car, I think that most of your readers will agree that if the question of steam vs. petrol is to be fought out, no better car can be found to represent the steam interests than the White steam car, and being interested in the manufacture and sale of the six-cylinder Rolls-Royce car, I am naturally delighted that "A Member of the London Stock Exchange," in suggesting this competition, should have selected the Rolls-Royce to represent petrol, and that in the Rolls-Royce, Mr. Coleman acknowledges that he has a fit competitor.

Unhesitatingly I accept Mr. Coleman's challenge, on the understanding that fundamentally the trial is to be a test of trustworthiness, and with a view to deciding which is the better type of luxury-touring carriage.

I should like to be the first to point out in this connection that the selling price of the chassis of the 30-horsepower White steam car is £675, whereas, the selling price of the chassis of the 40-50-horsepower six-cylinder Rolls-Royce is £950, or with magneto, £980.

This difference in selling price will not, I hope, prevent Mr. Coleman from proceeding to formulate a system of classifying results which may be such as will satisfy the champions of both steam and petrol, and which can be accepted by me.

My hope is that we may be assisted in this task by suggestions from your readers, I am, sir, yours, etc.,

CLAUDE JOHNSON.

WALTHAM CARS SELECTED BY POST OFFICE.

Since learning the results of the long and exacting test to which the Orient buckboards were subjected in the rural free delivery service last summer, the Post Office Department has reversed its former decision of not permitting carriers to use automobiles of any nature without special permission, because "they were unreliable and did not serve a route with regularity," and has made one of the Orient 4-horsepower buckboards fitted with special pigeon-hole carriers as used in the tests, a part of its exhibit at Jamestown. In addition to thus upholding the car as typifying the most modern and economical as well as the most expeditious method of making rural deliveries, they have gone further and ordered two of the Waltham 8-horsepower delivery cars with regulation screened mail-wagon bodies, which will be used for transporting mail pouches between the Exposition grounds and the railway and steamship terminals. This approval of the Waltham cars as being representative of a maximum of economy and dependability in service is of much more significance than would appear on the surface, as the step was taken entirely on the initiative of the Government officials and without any solicitation to that effect by the manufacturers, the Waltham Manufacturing Company, Waltham, Mass.

The new Detroit store of the Winton Motor Carriage Company is located at 736 Woodward avenue. The company took possession on May 1.

BRIEF ITEMS OF NEWS AND TRADE MISCELLANY

A typographical error appeared in the advertisement of the Electric Vehicle Company, printed in the last issue of THE AUTOMOBILE. The price of the Mark XLVIII standard touring car should have been \$3,000, as stated in the current announcement of the same manufacturers.

The Reo Bird which holds the world's mile record for middleweight cars will make its appearance on the track again this spring. The Bird was designed by R. E. Olds, and built by the Reo Motor Car Company, from whose plant it was shipped to California this week. This year it will make its debut on the Los Angeles track during the race meet to be held there May 4.

James Joyce, who recently made public his opinion that a rule should be adopted for the Glidden tour this year looking to the sealing of the bonnets of the cars, has shown that he has the strength of his convictions by being the first to enter a car in the Automobile Club of America's four-day contest, to be run next June, under rules of this nature. He will drive a 40-h.p. Berliet.

On a recent tour through Germany and Austria to the Dolomites in his Winton, Dr. Wm. A. Spring, an American dentist residing in Dresden, visited Oberammergau, where the Passion Play is held every ten years. "We tried to see Anton Lang, who took the part of Christ," writes Dr. Spring, "but he was away, setting up a porcelain stove. We found 'Caiphas' and 'Judas' at home, and they received us very cordially. 'Judas' is said not to like his part."

Blood Bros. Machine Company, of Kalamazoo, Mich., manufacturers of universal joints and steering gears, have again found it necessary to increase their facilities to keep up with the rapidly growing demand. This time they have purchased a tract of land on Ransom street and the South Haven railroad and have moved into the factory buildings that were located there. With the new buildings they are putting up, they expect to have double the capacity for 1908 that they had at the beginning of this year.

That the gasoline truck is coming into its own in New York City is evident when Arnold, Constable & Co., who were pioneers in the adoption of the electric vehicle for delivery purposes, have come around to its favor. They have recently placed an order for four Maxwell delivery cars. What this means in the way of expediting service as well as reducing the cost of delivery, particularly on the heavy item for labor and maintenance, is apparent from the fact that nine electrics now in service permanently displaced 33 horses.

A new tire for motor trucks and commercial motor vehicles, very striking in appearance because it is made of white rubber, and for which much is claimed, has been developed by the Diamond Rubber Company. The tire is made in the well-known side wire type. It is extremely resilient, due in part to the

fact that it is made entirely of new and very elastic rubber. This, of course, is a factor tending to reduce the consumption of power and consequently increases the mileage, particularly that of electric vehicles. All tests indicate that this tire will attract marked interest in the commercial vehicle field.

"Troubleless Touring" abroad evidently appeals to many autoists, for Cecil Hodgman, manager of the foreign touring department of Smith & Mabley, Inc., is being overwhelmed with inquiries from all over the country. Several clients of this department are already enjoying the "Simplex" life on the other side of the pond and a number of Simplex cars have been chartered for the coming summer. The ease and certainty with which such a trip can be undertaken appeals to those owners of cars who do not regard a foreign trip favorably owing to the difficulty of shipping and the formalities involved, while to those of the non-autoing fraternity there is nothing to equal it.

Quite on a par with that story of the man who, failing any gasoline, kerosene, alcohol or sundry other fuel, ran his car home by breathing into the carbureter after taking a cocktail or two, is this one of C. W. Kelsey, formerly sales manager of the Maxwell-Briscoe Company. After the last Vanderbilt Cup race he found the gasoline tank empty with the car stranded in the Long Island woods. However, noticing the condition of the roads which had recently been oiled for the race, resourcefulness, such as automobiling proverbially inspires, came to his aid. It was the work of but a moment to disconnect the suction pipe of the motor and extend it to the road, whereupon cranking immediately started the motor and it ran perfectly on a mixture of —. The next member of the club is requested to step up and tell his.

NEW AGENCIES ESTABLISHED.

An agency for the Reo automobile has been secured in Augusta, Ga., by A. S. Ledbetter, with offices at 524 Broad street.

C. H. Foster, president of the Cadillac Company of Illinois, has been appointed Chicago and Western representative for the French electric automobile Gallia, manufactured near Paris by the Société Electrique des Voitures Gallia.

Arrangements have been made for the handling of the complete line of Waltham touring and runabout cars, also Waltham Orient buckboards, in Northern Indiana and Southern Michigan by the South Bend Automobile and Garage Company, at 228 South Lafayette street.

The Fawkes Auto Company, formally opened its new establishment on West Sixth street, St. Paul, Minn., last week. M. E. Woods, who formerly managed the local branch of the company when it had an establishment in Fifth street, will be the manager of the new place. The concern handles the Rambler, National,

Glide and Holsman gasoline cars and the National electrics.

The Acme Motor Car Company, of Reading, Pa., which was recently reorganized, has started on an aggressive sales campaign. Up to the present the following agencies have been appointed: Scull-Morris Motor Company, Philadelphia, Pa.; Boston Motor Company, Boston, Mass.; Theo. E. Schulz, New York City; Standard Motor Car Company, San Francisco, Cal.; John M. Larsen, Chicago, Ill.; F. W. Kavanaugh, Troy, N. Y., and central portion of New York State; Pecos Auto Company, Pecos, Texas, and vicinity.

PERSONAL TRADE MENTION.

J. L. Straub, secretary-treasurer of the J. S. Bretz Company, of New York City, will sail for Europe early in May. While abroad Mr. Straub will visit the factory of Fichtel & Sachs at Schweinfurt, Germany, manufacturers of the F. & S. annular ball bearings.

John E. Miller has been appointed superintendent of the works of the Deere-Clark Motor Car Co., Moline, Ill. Mr. Clark has a reputation for surrounding himself with strong men and this latest appointment adds to his record. Mr. Miller has been actively engaged in the manufacture of automobiles for a number of years.

The J. S. Bretz Company, of New York City, have secured the services of Harry J. Porter, of Rochester, N. Y., who will make his headquarters in Detroit and will cover the Western territory in the interests of the F. & S. annular bearings, Hartford universal joints and other lines the sale of which the Bretz Company controls.

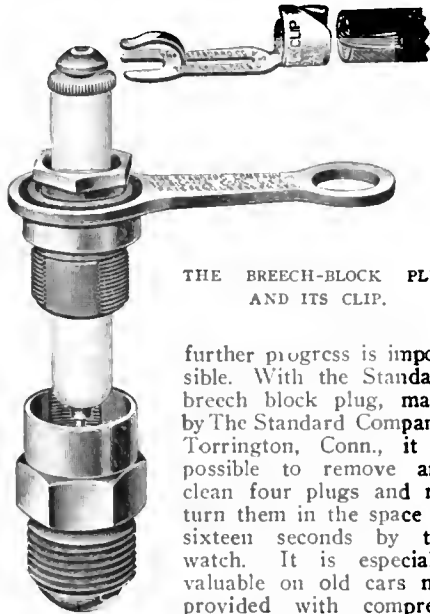
Burton Parker, advertising manager of the Fisk Rubber Company, Chicopee Falls, Mass., is going the rounds of the principal branch offices of the company to obtain material for the "Pneus," the entertaining and instructive booklet that the company issues monthly. Copies are sent gratis on application to anyone interested in tire lore and the newest things in the field of rubber.

A. F. Justin has resigned as manager of the Penn Auto Supply Company, of Philadelphia, to take charge of the Providence branch of the Angier Company. The latter's establishment in that city has just been remodeled and enlarged, giving double the amount of floor space formerly used. In addition to the regular lines of automobile supplies, motor boats and boat supplies have been added.

F. L. Thomas, formerly local sales manager for the H. H. Franklin Manufacturing Company at Syracuse, has accepted a position as branch manager at Chicago for the Franklin Automobile Company. Mr. Thomas is well known in the automobile trade, having been associated with the Fredonia Manufacturing Company and also held the position of branch manager for the Knox Company at Buffalo.

INFORMATION FOR AUTO USERS.

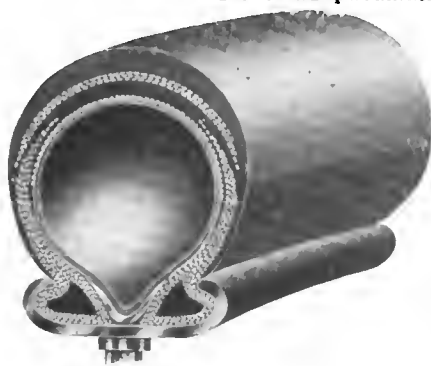
The Breech Block Plug.—There are few things more exasperating than to have a plug that has gone wrong stick in the cylinder and refuse to budge despite every effort that can be brought to bear to get it out and particularly in the case of single and two-cylinder cars as



THE BREECH-BLOCK PLUG AND ITS CLIP.

further progress is impossible. With the Standard breech block plug, made by The Standard Company, Torrington, Conn., it is possible to remove and clean four plugs and return them in the space of sixteen seconds by the watch. It is especially valuable on old cars not provided with compression relief cocks in the cylinder heads, as it provides a means of injecting kerosene with equal convenience. It has numerous other advantages in addition, not the least of which is its round enclosed end preventing a cracked or chipped porcelain from falling into the cylinder and doing expensive damage. This protection also prevents burning off the glazed end of the porcelains and renders them easy to clean and long-lived. In connection with the "Breech-Block" clips, which snap the connecting wire onto the plug end in a jiffy, the breech block plug is a combination that is hard to beat for convenience and all round handiness.

Puncture Proof Tires.—The recently organized Akron Pneumatic Tire & Protector Company, Akron, O., is now placing on the market a new puncture proof tire and an extensible tread pneumatic



GREENWALD EXTENSIBLE TREAD TIRE.

tire, both of which are the inventions of L. Greenwald, formerly superintendent of the repair department of the Goodrich Rubber Company's works. The extensible tire is built on a new principle in

that it is designed to take the sudden heavy pressure caused by the tire striking an obstacle on the rubber instead of the fabric, thus preventing ruptures. This is provided for by a so-called hinged portion in which the fabric is omitted and replaced by rubber, which also permits the tire to have a greater heat-radiating capacity. This plan of building up the tire, which is shown by the accompanying illustration, Fig. 1, is also claimed to permit greater compensation for different loading than ordinary tires. The puncture proof type of tire is shown in Fig. 2; the tire is rendered impermeable by means of three layers of copper-plated steel discs placed in strata of rubber in such a manner as to present a



GREENWALD PUNCTURE-PROOF TIRE.

practically continuous band, this also making the protector of a very flexible nature, so that it does not interfere with the resiliency of the tire. This protector is so made that it can be interposed between the outer case and the inner tube, so that it may be readily removed whenever desired. Mr. Greenwald, who heads the new company, has also devised a reinforced inner tube with a fabric envelope designed to eliminate pinching by the clips or beads, which will also be manufactured. An active demand for its products is reported.

Stewart Speedometers.—Automobile manufacturers are not alone in taking time by the forelock by getting their 1908 models on the road ten months ahead of time. The Stewart & Clark Manufacturing Company, 502 to 520 Diversey boulevard, Chicago, announce that having booked orders for all the 1907 models of the Stewart speedometers that they can possibly turn out, they are now booking orders for the 1908 model, which will be made in four styles, 50-mile, 60-mile, 90-mile and 120-mile dials. This series will be fitted with the new swivel joint, which permits the flexible shaft to be carried straight back along the frame to the dash without the necessity of passing through or under the springs, thus doing away with the right-angle construction usually required, which adds a most attractive feature to the Stewart.

The accompanying illustration reveals the internal construction of the new 1908 model. The spindle or central shaft is made of selected steel hardened and ground and is mounted on ball bearings. An exceptionally long coiled spring of large diameter is employed to return the

indicator hand to the starting point. The steel shoe for moving the indicator is made file-hard. Every part is of the most substantial construction, thus insuring long life. The bevel gear angle-joint on

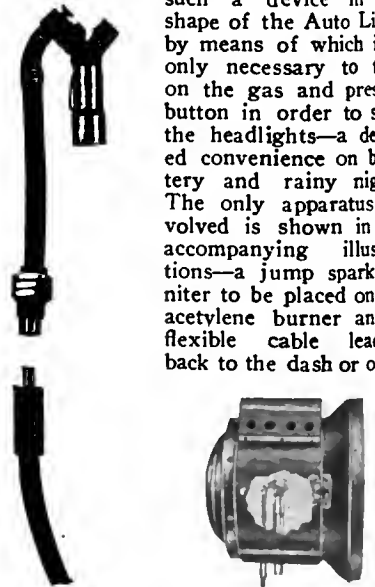


MECHANISM OF THE STEWART SPEEDOMETER

the instrument permits the flexible shaft to be carried down close alongside the dash and in connection with the new swivel joint makes the Stewart installation on the car an ideal one in every respect.

The Auto Light.—Considering that the car has always carried the necessary battery and coil equipment for electric gas lighting, it seems strange that some inventor has not taken advantage of them to apply it to the lighting of the acetylene headlights long ago. It has remained for the Rolfe-Fox Company, Livingston Building, Rochester, N. Y., to provide

such a device in the shape of the Auto Light, by means of which it is only necessary to turn on the gas and press a button in order to start the headlights—a decided convenience on blustery and rainy nights. The only apparatus involved is shown in the accompanying illustrations—a jump spark igniter to be placed on the acetylene burner and a flexible cable leading back to the dash or other



DETAILS OF THE AUTO-LIGHT.

convenient place where the push button is located; the rest is merely a matter of making the proper connections.

A Quarterly Calendar.—From the Winton Motor Carriage Company, Cleveland, is to hand a quarterly hanging calendar, well designed and produced, showing the various types of Winton machines from the early days of 1896 to the present date.

THE AUTOMOBILE

HOW NAZZARO WON THE TARGA FLORIO

PALERMO, April 25.—Italy is victorious. Of the first ten cars to finish this hard-fought fight seven are Italian and three French. First, second and third positions have been secured by the newcomers to automobiling; France takes fourth, sixth and tenth positions. Nazarro on a Fiat is the victor, at an average speed of 33.45 miles an hour, with Lancia on the same make of machine twelve minutes later and Fabry's Itala in third position.

that test the most powerful brakes. It is the thousand-bend course, for of the 92.47 miles forming the circuit there is only one stretch that can lay claim to be a straightaway run, and there are portions of the circuit where the road winds about on itself in the most intricate and perplexing manner. Three times round gives a total distance of 277.4 miles.

Opel, on an Opel machine, followed the leader; Wagner was



NAZZARO ON HIS VICTORIOUS FIAT PASSING THROUGH PETRALIA SOTTANI ON WILD SICILIAN COURSE.

After three or four days of rain the morning opened with a bright sky and gentle Sicilian breezes which wafted the aroma of citron and orange trees from the distance. Exactly at 5 o'clock Salvioni, an Italian piloting a French Pilain stripped touring machine went over the line amid the excited chattering of an Italian crowd encouraged by a cheer from the strong Franco element. Three times round a mountainous course, starting from the level of the sea and mounting up to giddy heights over one thousand meters above, with grades that stand up like walls, and descents

just behind him, getting away with a rush and a roar, the fastest of the lot. Lancia was about in the middle of the forty-six; Gauderman on a Bayard-Clement had the position that Albert Clement would have occupied had not the military martinets declared that he should not leave his barracks. Hémerly was at the wheel of a Deluca-Daimler, an English-Italian combination. An Isotta-Fraschini, Italian construction, De Dietrich design, closed the list of competitors, forty-six in number.

Hardly had the last machine passed out of sight than the first



WAGNER AT HIGH SPEED PREVIOUS TO BEING PUT OUT OF COMMISSION BY THE SKIDDING OF HIS MACHINE.

to finish the round put in an appearance. It was Opel, followed at an interval of one minute by Wagner, with Trucco and an Isotta-Fraschini on his heels. The Italian had gained one minute on the French champion, but the position was soon lost, for a broken chain put a stop to his wild flight. Trucco made the fastest time of the first round, and as events proved, of the entire course, finishing the initial round in 2:39.8, or more than 34 miles an hour, a splendid performance over such a mountain track. Lancia was only four minutes slower, and Wagner proved the fastest of the Frenchmen.

The outcome of the contest was very undecided at the end of the first round, and excitement increased at the official betting booths. From the outside news came through of accidents and cars broken down on the pitiless course. Salvioni, who set the pace with a Pilain, had finished his course in a ditch, a Berliet had broken an axle, Hieronymus, the German champion, had smashed three wheels, others were out of the race for unknown causes. Thirty-seven finished the first round.

On the second round Wagner made the fastest time and secured second position in the general classification, being only a few minutes behind Nazarro. For a time there was excitement and enthusiasm in the French camp, and just a fear that Lancia, who started 56 minutes behind the Frenchman, might make faster time than the Vanderbilt winner. There was a roar in the distance and Duray rushed by to the delight of the French, followed later by Lancia, who started later, but beat the Dietrich man by less than a minute. When it was possible to calculate the positions, Nazarro with a Fiat was found to be at the head, Wagner was second, Lancia third, Duray fourth and a couple of Italas fifth and sixth.

Wagner Breaks Down After Fast Run.

As the time for the first cars to finish the race drew near, excitement increased. Who would finish first, and would the first to finish be the victor? During the height of the clamor news went abroad that Wagner had abandoned. It was only too true, and instead of the light Darracq it was the heavy Dietrich with Duray at the wheel which was first to finish the course. French cheers had not died away when Lancia rushed up with a shorter elapsed time than Duray, followed a second later by Garcet on a Bayard-Clement. There only remained Nazarro and Fabry, the Fiat and Itala drivers, who could possibly beat Lancia, and in any case the Italian victory was secure. Thirty-nine minutes after Lancia finished his course, Nazarro rushed to the finishing line. He had started fifty-one minutes after him and was consequently the victor by twelve minutes. The strenuous nature of the contest is seen from a comparison of the times for the first ten machines. Between the arrival of Nazarro's Fiat and Garcet's Bayard-Clement in tenth position there is only a difference of 36.6. The first three machines were separated by intervals of twelve and three minutes respectively, and several of the following positions were only decided by seconds.



LANCIA, WHO HELPED TO MAKE FIAT TEAM VICTORIOUS.

Fiat had a most remarkable victory, for Lancia, Nazzaro and Weillschott were all among the first ten. Itala and Lorraine-Dietrich each had two with this select circle. The French, while admitting their defeat, point out that the two Isotta-Fraschini are really French machines being built in Italy under Lorraine-Dietrich designs.

Nazzaro, who in addition to the Targa, will pocket the first prize of \$3,000 in cash, was second in the last Gordon Bennett contest, in which Théry reached the pinnacle of his glory, and was second last year in the French Grand Prix, being beaten then by Szisz on a Renault, but defeating Albert Clement after the most exciting neck-and-neck races ever known. "Now we are ready for the Grand Prix," declare the Italians. "So are we," riposte the French.

Official Positions at Finish of the Targa Florio.

	H.	M.	S.
1. Nazzaro, Fiat (Italy), Michelin dismantable rims.	8	17	38
Average, 33.45 miles an hour.			
2. Lancia, Fiat (Italy), Michelin tires.....	8	29	29
3. Fabry, Itala (Italy), Michelin tires.....	8	32	40
4. Duray, Lorraine-Dietrich (France).....	8	39	7
5. Cagno, Itala (Italy).....	8	39	16
6. Gabriel, Lorraine-Dietrich (France).....	8	39	46
7. Tamagni, Isotta-Fraschini (Italy).....	8	41	45
8. Weillschott, Fiat (Italy).....	8	42	52
9. Sorel, Isotta-Fraschini (Italy).....	8	52	0
10. Garcet, Bayard-A. Clément (France).....	8	53	14
11. Minoia, Isotta-Fraschini (Italy).....	8	53	19
12. Maggioni, Züst (Germany).....	9	0	7
13. Ison, Deluca-Daimler (Italy).....	9	1	22
14. Dureste, Gobron (France).....	9	10	24
15. Erle, Benz (Germany).....	9	11	15
16. Gremo, Junior (Italy).....	9	13	38
17. Spammann, Benz (Germany).....	9	15	56
18. Buzio, Diatto-Clément (Italy).....	9	20	5
19. Gauderman, Bayard-A. Clément (France).....	9	29	4
20. Hubertot, Deluca-Daimler (Italy).....	9	32	20
21. Collinet, Bayard-A. Clément (France).....	9	38	25
22. Gallina, Rapid (Italy).....	9	50	10
23. De Bojario, Benz (Germany).....	9	52	40
24. Hémyery, Deluca-Daimler (Italy).....	10	16	20
25. Capuggi, Züst (Germany).....	10	32	30
26. Gasté, Radia (France).....	10	33	25
27. Faure, Gobron (France).....	11	17	25
28. Pizzagalli, Pilain (France).....	11	21	53

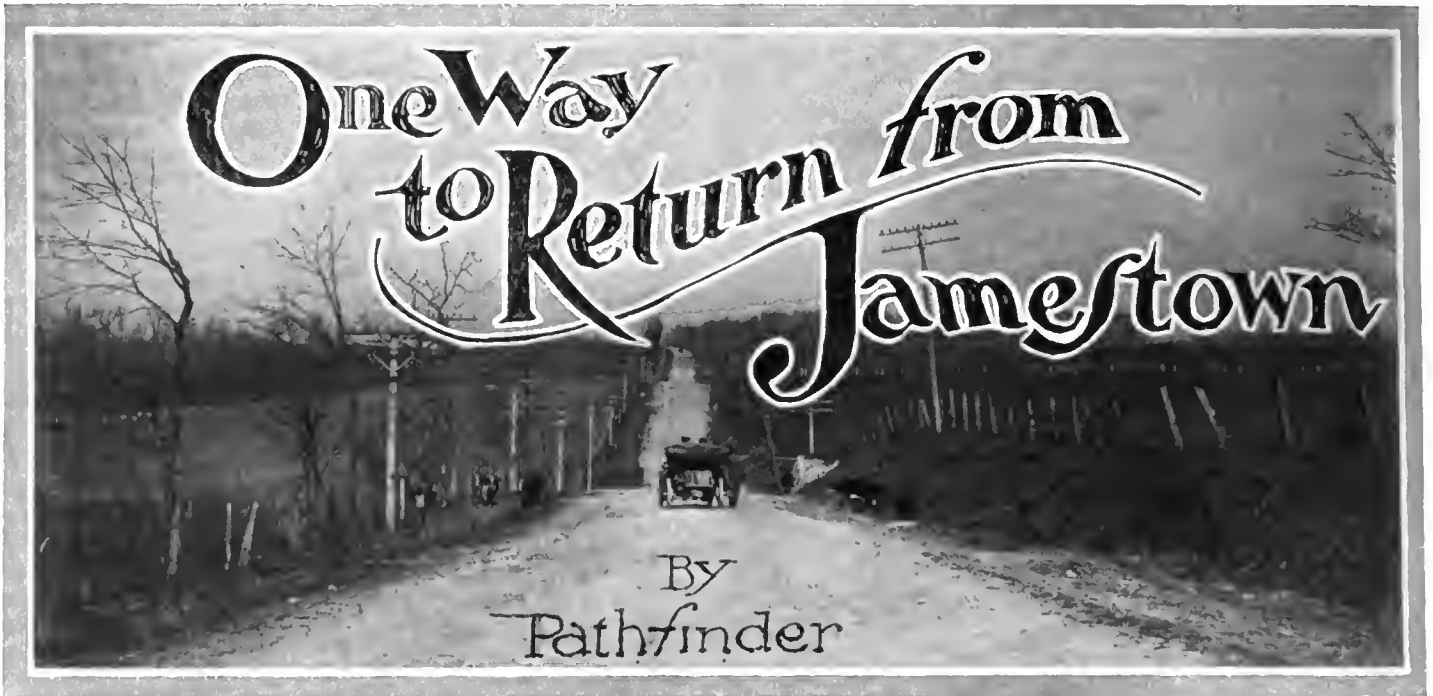


HIERONYMUS, A GERMAN VICTIM OF THE PITILESS COURSE.

Mechanical defects put very few machines out of the race, most of those not present at the finish being the victims of accidents due to the wild nature of the course. Wagner, who at the end of the second round appeared a certain winner, was forced to abandon, owing to his car skidding. His companion Hanriot was put out of commission in a similar manner. Both the Berliet machines skidded, smashing their wheels and breaking axles. Garcet, who was terribly fast on his Bayard-Clément, and looked certain for third place at one time, lost this position through a tire tearing off and his carbureter choking with dust.



FABRY AND HIS ITALA ON A ROAD IN THE MOUNTAIN WILDNESS AROUND PETRALIA SOTTANI.



IF THERE WERE NONE OF THE BOTHERSOME WATER-BARS, THE NATIONAL HIGHWAY WOULD BE AN EXCELLENT TOURING ROAD.

WHEN the tourist who has made the trip to the Jamestown Exposition, has seen all the exhibits, been up and down the "war-path," looked over the naval display, and visited the various points of interest around Norfolk, he may find that he has not sufficient time at his disposal to return north by the all-land route via Richmond, Staunton, and the Shenandoah Valley. To those who wish a shorter return route, and yet desire to pay a visit to a historic section where much of the fighting of the Civil War took place, I would like to recommend the route which our party traversed on our recent return from the Exposition.

After much consultation and studying of maps, we decided to take the boat to Baltimore and then proceed westward over the old National Highway to a point where we would strike the main route from the Shenandoah Valley to Hagerstown. Our choice proved a most fortunate one.

There are two lines of boats from Norfolk and Old Point Comfort to Baltimore: the Old Bay Line and the Chesapeake Line. Probably the competition between them explains the comparatively low rates charged—\$8 for carrying the automobile and \$2 per passenger, including stateroom, if my memory serves me correctly. The first named line has the more modern boats, and should probably be given the preference, but travelers should make inquiries as to just what vessel is to sail on any particular date, because the best boats may be diverted for the use of some

excursion. Leaving Norfolk at 6 P.M., and Old Point Comfort an hour later, the boat docks at Baltimore early in the morning.

Baltimore has entirely recovered from the great fire of February, 1903, and the "burned district" is now a solid section of new modern buildings. An hour or two might well be devoted to a ride around the city. Baltimore is called the "Monumental City," and well deserves the name. On the principal parkways there is a monument every block. The supply of national heroes has been long ago exhausted, and the more recent monuments are to individuals so little known that the visitor constantly exclaims, "Who was he?" The Automobile Club of Maryland has very comfortable quarters in the downtown district, and keeps "open house" to visiting A. A. A. tourists at all hours.

There are splendid macadam roads all around Baltimore, and there are no less than five distinct routes to Ellicott City, where the National Highway proper commences. We went in our White steamer by way of Oella, a little hamlet entered by means of as sharp a "Devil's Elbow" as I have ever seen. Just beyond here we saw the place where the first railway construction in this country was undertaken, the same right of way being now a part of the Baltimore & Ohio Railroad. At Ellicott City begins the famous National Highway, which was opened for traffic almost exactly one hundred years ago. The road is now in the hands of a private company, which charges toll, but keeps the road in very



RIDGEVILLE'S EAGLE HOTEL STILL POSSESSES ITS L. A. W. SIGN.

"JONAS ELLICOTT PRODUCED THE BOLD PLAN OF THIS BRIDGE."



HOMES LIKE THESE FREQUENTLY FOUND IN MARYLAND.

good condition, the only ground for criticism being the numerous water-brakes, which, if taken at speed, give both cars and passengers a severe shaking up.

Ridgeville, thirty-four miles from Baltimore and twenty-one miles from Ellicott City, is the first town of any size along the Pike. The Eagle Hotel here has a reputation for serving good meals, and our experience here led us to believe that its fame in this direction is well founded.

Just before reaching Frederick, we saw the famous old stone bottle which marks the approach to a long stone bridge, the age and style of which are best described by this inscription on the bottle:

"Jonas Ellicott first produced the bold plan of this bridge with arches of 65-foot span; built 1808-09."

Two miles further on we entered Frederick where, according to the poet, in the early days of the Civil War:

Up the street came the rebel tread,
Stonewall Jackson riding ahead.
Under his slouched hat left and right
He glanced; the old flag met his sight.
"Halt!"—the dust-browed ranks stood fast
"Fire!"—out blazed the rifle blast.
It shivered the window, pane and sash,
It rent the banner with seam and gash.
Quick as it fell, from the broken staff,
Dame Barbara snatched the silken scarf.

HARPER'S FERRY, BUSY, PICTURESQUE AND HISTORIC.

She leaned far out on the window-sill
And shook it forth with a royal will.
"Shoot if you must this old gray head,
But spare your country's flag," she said.

On the further side of Frederick, the National Highway bends northwestward toward Hagerstown. We had in mind to go by a longer but much more interesting route, and, accordingly, left the highway at this point, and, bearing left into a well-kept toll-road, passed through Jefferson and Petersville, and then over a rough road to Knoxville, sixty-three miles from Baltimore. Here we came out from the hills to the valley of the Potomac river, which we followed for four miles, and then crossed the old iron bridge from Maryland into Harpers Ferry, West Virginia.

Harpers Ferry is at the confluence of the Potomac and Shenandoah rivers, and is a natural strategic point. Here it was that John Brown, in 1859, after his mad attempt to free the slaves, was captured by the National troops. No vestige now remains of the arsenal in which he and his daring band of twenty-one men made their last stand, but a simple monument marks the spot. The arsenal, it should be said, was evacuated and destroyed by the Northern soldiers a week after the firing on Fort Sumter, to prevent the vast stores contained therein from falling into the hands of an advancing body of Confederates. While the arsenal is gone, many of the buildings of the old town date back to antebellum times. There is a distinct fascination about a place



A GLIMPSE OF FREDERICK, WHERE BARBARA FREITCHE WAVED HER FLAG FROM THE ATTIC WINDOW.



ANTIETAM'S BLOODY BATTLEFIELD, WHERE THOUSANDS DIED.

around which cluster so many historic memories, and we left Harper's Ferry with great reluctance. Four miles west, at Halltown station, we turned into the same road which we would have traversed had we returned by way of Richmond and Staunton. At Charlestown we again crossed a bridge over the Potomac back into Maryland, and, after passing through Sharpsburg, crossed

tourist should object to a few miles of bad going after having had more than one hundred miles of macadam.

The valley is finally reached at Fairfield, from which it is but an eight-mile stretch into Gettysburg. The magnificent battlefield there, and the two routes leading to Philadelphia, I have already described in the November 22 issue of *THE AUTOMOBILE*. I should point out, however, that the condition of the pikes is immeasurably better than when we made our trip last November. Considerable work has been done on the roads, including the smoothing out of many of the water-brakes. If the tourist returns to Philadelphia via York, Columbia, Lancaster, and Coatesville, he will find the Colonial Hotel at York, ninety miles from Philadelphia, a most desirable place to spend the night. In the morning it will be well worth his while to drive to the top of Reservoir Hill and have a view of the adjacent counties.

As I pointed out three weeks ago, the distance from Philadelphia to Cape Charles is 240 miles. That from Baltimore to Philadelphia by the route above described is about 250 miles. The tourist who makes this round trip, starting from and ending at Philadelphia, will agree with me, I think, that nowhere else will he find a route of approximately 500 miles which will make such a lasting impression upon his memory, particularly if undertaken while the Jamestown Exposition is in full swing.

Many whose touring has been limited to the New England and Middle Atlantic States have no idea of the wealth of scenic ter-



WHITE STEAMER CLIMBING THE BLUE RIDGE—ROADS NONE TOO GOOD, BUT SCENERY SUPERB, AND TOURIST WELL REWARDED.

the battlefield of Antietam. Here may be seen, on either side of the highway, numerous fine monuments, some in memory of the Blue and some to perpetuate the valor of the Gray.

Another ten miles and we were in Hagerstown, which is the first city of any size we had seen since leaving Baltimore, the distance between the two places being ninety-seven miles. This is the best place for the tourist to spend the night. By no means should he make the trip to Gettysburg, thirty-four miles further north, after nightfall, because the road between Hagerstown and Gettysburg offers no unusual scenic attractions. North of Waynesboro, Pa., it passes over the Blue Ridge, from the summit of which the view is indescribably beautiful. On this ridge there are several great hotels, a number of fine country estates, and one or two hunt clubs of wide reputation. After crossing the main ridge there is a smaller ridge to be crossed, and here will be found the only stretch of bad going on the entire journey. The road is not simply bad—it is fierce. It abounds in "Thank-you-ma'ams," it is deep with mud in wet weather, and is just wide enough for one vehicle. Those who drive gasoline machines, which have no provision for feeding gasoline under pressure should make sure that their tanks are full before starting over this mountain. Otherwise, owing to the steepness of the grade, they may not be able to get gasoline to their carbureters. This stretch of road, however, is thoroughly passable, and no seasoned

ritory farther south. True it is that some effort is required to reach this section, but the indifferent roads between could be much worse, and, as American highways average, the traveling is well within the power of a sturdy car, capable of doing some climbing when occasion demands.



TOLL GATES ARE FREQUENT AND DECIDEDLY ANNOYING.

SESSION OF A. L. A. M. MECHANICAL BRANCH.

HARTFORD, CONN., May 9.—This week the three days' meeting of the Mechanical Branch of the Association of Licensed Automobile Manufacturers is being held in this city. All day yesterday was devoted to a closed session held at the laboratory of Henry Souther, on Capitol avenue, the association's consulting metallurgical expert. Important subjects were taken up, the first being motor valve-timing, with a view to determining the exact point at which the inlet valves should fully open and close in order to obtain the maximum efficiency. This was followed by a series of tests on vanadium steel castings, and the results of the former are said to promise some information of an interesting character regarding this alloyed product. The subjects of detachable rims and the adoption of formulæ for the calculation of horsepower ratings were slated for the afternoon session.

To-day's session of the Mechanical Branch is being held at the Heublein Hotel. The subject is to be a discussion of the various standard cooling and lubricating systems in current use and a comparison of their merits. Upon the conclusion of this, the members will go in a body this afternoon to make their annual inspection of the association's laboratory, together with the new machinery which has been installed for the extensive tests of the metallurgical and physical properties of metals most largely used in automobile construction.

To-morrow (Friday) will be given over to the *annual* run. This will be about seventy-five miles, and the route lies through parts of the State that are distinguished both for their fine roads and their many historical associations. The start will be made at 9 A.M. from the laboratory, the first stretch being through Wethersfield and Rocky Hill to Middletown, about seventeen miles. This will be the first control, and here there will be a general shifting about, so that every engineer will have a chance to ride in the other fellow's car. Haddam is the next point on the route; it is a quaint old town that the march of progress has passed by, and is much the same to-day as it was generations ago. From here the route leads to Goodspeed's ferry, which will be utilized to cross to East Haddam—the lunch control.

The return trip will be up along the east bank of the Connecti-

cut, with the first afternoon control at Cobalt Crossing; other towns passed through being Portland and South Glastonbury, from the last of which the road leads to East Hartford and across the bridge and home. Though most of the roads included in the itinerary are fine macadam stretches there are some back country roads as well, besides one or two stiff hills.

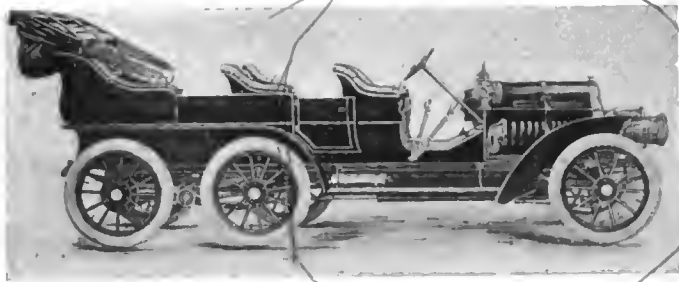
The meetings have been well attended on both days, and it is expected that there will be additional members here to-morrow, bringing the total over sixty, who will be transported in the following cars: two Pope-Hartfords, Knox, Locomobile, two Thomas forties, Royal Tourist, Franklin, Corbin, Oldsmobile, Autocar, Studebaker, Pierce, Thomas Flyer, two Columbias and a Haynes.

COMMERCIAL SHOW TO BE ANNUAL FIXTURE.

Being of the opinion that a sufficient number of manufacturers of commercial vehicles can be secured to make a showing by themselves, the executive committee of the National Association of Automobile Manufacturers, at its meeting last week, decided to inaugurate the first annual national exhibition of commercial vehicles, to be held in conjunction with the regular show of pleasure vehicles at Chicago this year, which will take place during the week of November 30 to December 7, under the auspices of the national association, as usual. It has long been evident that commercial vehicles could not satisfactorily be shown together with pleasure vehicles, and while there has been more or less complaint on this score on the part of the makers of the latter, the number of manufacturers concerned was not sufficient to permit of the remedy now decided upon. There will be but one admission charged to both separate sections of the show, though it is expected that admission to the commercial end will be very largely by invitation, and to that end exhibitors will be liberally supplied with admissions. Those present were: Albert L. Pope, S. T. Davis, Jr., W. T. White, W. R. Innis, C. C. Hildebrand, M. J. Budlong, George W. Bennett and William Mitchell Lewis. R. D. Chapin, E. R. Thomas Motor Company, was elected to membership, vice Ezra Kirk, resigned, and James Joyce, American Locomotive Company, was elected in place of H. F. Ball.



GOING OVER THE ROUTE OF THE A. L. A. M. ENGINEERS' RUN TO BE HELD MAY 10. H. P. MAXIM, CHIEF ENGINEER OF ELECTRIC VEHICLE CO., AND H. I. CLINTON, A. L. A. M., IN 24-H.P. COLUMBIA, NEAR GOODSPEED'S FERRY.



FIRST APPEARANCE OF THE SIX-WHEEL AUTOMOBILE.

NOVEL SIX-WHEEL CHASSIS DESIGNED BY PRATT.

With the present four-wheel construction, automobiles appear to have reached their limit of wheelbase, and if further length is required it appears likely that the six-wheel type, already in use in Europe, will have to be adopted. Charles T. Pratt, president of the Pratt Chuck Works, of Frankfort, N. Y., has designed and secured patents on a vehicle of this nature. The front and intermediate pair of wheels are steerable, the intermediate pair turning in a lesser angle than the leading pair, power being supplied from a 75-horsepower gasoline engine to the rear pair of wheels only through the medium of an ordinary transmission gear and two-part rear axle shaft. The truck frame is so flexible that any of the four rear wheels may be raised or lowered to a considerable degree without reference to the others and without binding the driving mechanism or straining the frame. An advantage of the machine is that the additional pair of wheels prevents skidding and the two pairs of steering wheels also afford a much better control in directing the course of the vehicle. The car has a wheelbase of fourteen feet, one of the longest ever made, and is built to carry seven people, though additional seats may be added as desired.

ABOUT THE THOMAS MOTOR CAB.

The E. R. Thomas Motor Company, of Buffalo, motor cabs and town cars, have a four-cylinder, water-cooled motor, three speeds forward and reverse, selective transmission, and a shaft drive. The weight of the car is slightly over 1,500 pounds, and the wheels and tires are larger than have been used on cars of this weight or for this purpose before. The designs for these cars were worked out by Gustave Chedru, head of the foreign designing department of the company, who has made a careful and exhaustive study of the cab business in France, and who has designed the cab to embrace the qualities of the French article, with the different essentials incident to the requirements of the American public.

As soon as the plans were completed, months ago, it was found that a separate plant and special machinery would be necessary for the making of this class of cars. Deliveries of these cars will be made early in the fall.



THOMAS MOTOR CAB, THE LATEST THOMAS PRODUCTION.

BOSTON'S SHOW TO BE FOR AUTOS ONLY.

Boston, May 5.—The Boston Automobile Dealers' Association has at last taken the bull by the horns, so to speak, and has absolutely divorced the boat interests from its annual show. Practically ever since automobile shows began in this section the boat makers and the automobile manufacturers have exhibited side by side. But the automobile business has grown by such leaps and bounds and the boat business has increased so rapidly that for the past few years it has been absolutely impossible for all parties that wished to secure space in the Mechanics Building, the largest show building in New England. For some years past, therefore, it has been necessary to hold overflow shows in other buildings, and these have been anything but satisfactory to the management or to the exhibitors. When the show was held last March it became very plain that something radical would have to be done next year. The result was the decision of the Dealers' Association at a recent meeting to admit only automobiles and accessories to their annual show, and the concurrent decision of the New England Engine and Boat Association, backed by the National Association of Engine and Boat Manufacturers, to hold a show of its own in Mechanics Building the week beginning January 27, 1908. The automobile show will be held as usual in the middle of March, and Chester I. Campbell will manage both exhibitions.

Besides the general congested condition of the past shows, the situation as regards space was aggravated by the recent action of the Motor and Accessories Manufacturers' Association in deciding to exhibit in Boston next year. This association cut out the Boston show last March and some of its members thought it was a mistake. Therefore next spring all the accessories makers will be represented and they have already taken 10,000 square feet of exhibition space. This will give room for the display of new novelties, of which New England produces many.

CHINA AS AN AUTOMOBILE MARKET.

United States Consul Wilbur T. Gracey, writing from Tsingtau, states that there appears to be an excellent opportunity for the introduction of automobiles into the colony of Kiachow, his report reading:

There are at present only one American and two German machines in this city, but there is no reason why automobiles could not be used here to a large extent. The roads throughout the colony are excellent, being made through solid rock in many places, and all well macadamized. They run for a distance of 30 or 40 miles into the surrounding country, and with the gradual slope of the hills, about 15° to 20°, would be excellent for automobiles.

I believe that a cheap grade of automobiles could be introduced here for general use. They must be made to compete with the carriages which are now in use. Ponies can be purchased here for about \$40 to \$50 each, are used in pairs, and can be kept at about \$7 per month for feed and \$7 for a hostler. Carriages are either open Victorias, closed broughams, or dog carts, and cost, respectively, about \$350, \$400, and \$100. Small automobiles which are good hill climbers might be introduced if they could be supplied at a low price. Gasoline can be purchased at about 10 cents per gallon, and arrangements could be made for a lower price if there was a call for larger quantities.

The best way to introduce automobiles would be to ship a small number to some local firm to be sold on commission. It would be difficult to introduce machines here through catalogues. If the automobile manufacturers in the United States will forward copies of their catalogues to this consulate this office will retain one copy and pass the others to parties who may be interested. In quoting prices the machine should be given complete, with lamps and all necessary adjuncts. Some of the German firms quote their goods not only complete in every detail, but including extra parts which are liable to wear quickly, such as tires, etc. It must be remembered that American machines must compete with low-priced German goods. There are a good number of motorcycles in use in this city, and there would undoubtedly be a good sale for cheap machines of this kind. In both automobiles and motorcycles one of the most important points to be considered is that the purchaser is three months distant from the United States, and in the event of the breaking of any part of his machine it will be laid up for several months before he can secure new parts. Simplicity of construction is therefore important. Some local dealer should be well supplied with extra parts.



work with critical eye, modifying, improving and changing until both are satisfied. A working draft follows, and when this and the patterns are completed structural work is commenced. With very few exceptions, all high-class closed bodies are built up of wood and aluminum strengthened with iron stays. An open touring body is, with the exception of the frame and the stiffening irons, built up wholly of aluminum. Practice, of course, varies in different factories, but we are dealing with the method followed in the Locke works as descriptive of the highest development

in the modern art of automobile body building.

THERE are two kinds of automobile bodies, the ready-made and the made to measure, the difference between them being precisely that existing between the clothing store product and the article with which the sartorial expert covers your nakedness and hides your natural defects.

The man who lays down ten thousand dollars for a machine is in a position to pay the necessary quota to obtain the elegance and material comfort of which his automobile is worthy, and indeed modern tendency is towards greater elegance and more comfort in automobile bodies.

As can be readily imagined, the building of the highest class of automobile body demands the finest of materials, considerable skill and experience, and is not a task that can be rushed through in a few days. To form an idea of the nature of the work, to watch the up-building of the best bodies on the best chassis, and follow through all the processes from the day the bare machine enters the works to the moment it comes out in the glory of its graceful curves, its well-designed body, its convenient fittings and its mirror-like finish, one must spend a few hours wandering around the works of a reputable body builder.

At 218 and 220 West Eighty-fourth street, a few yards from Broadway, a large proportion of New York's automobile body-work is turned out under the signature of Locke & Co. Incidentally the six-story factory generally contains an assortment of the latest models of foreign chassis awaiting their upper half, only equaled in importance by the annual shows.

Stages in the Growth of a Body.

The high-grade body, such as would grace a Fiat, a Mercedes, or other "de luxe" chassis, is put in hand weeks before the chassis makes its appearance at the carriage works. Frequently, indeed, a closed body begins its growth before the chassis for which it is intended has left its native land. The necessity for this will be obvious when it is learned that the best closed bodies require three to four months to build.

The first stage in the body construction is a full size drawing on a blackboard, made to fit and harmonize with the chassis from blue prints of the latter. Customer and designer examine the

Making a Combination Wood and Metal Body.

For the frame work ash is generally employed. It combines strength and flexibility in desired proportions; it is nearly as strong as oak, without having the brittleness and unbending nature which is that wood's chief defect; it is stronger than hickory without having the excessive springiness of that wood. A machine which is constantly subjected to shocks must be constructed of materials of the very best quality and of such a nature as to combine strength with a certain amount of flexibility. For such panels as are not filled in with aluminum, what is known in the trade as white wood is employed. The varied parts forming the frame having been cut out according to patterns, they are assembled on a pair of trestles and form a skeleton body. There are big gaps between the wooden ribs which must be filled in. Sheet aluminum, about one-sixteenth of an inch thick, is the material employed. It would be almost impossible to accommodate wood to the curves of a stylish automobile body. Sheets of aluminum, cut out to pattern, can be made to fit the most difficult bends by judiciously beating with a hammer on the inside of the curves. Each plate is screwed down to the frame and its edges hidden by a beading of aluminum securely fastened in position, the heads of the nails being filed down so that nothing mars the smoothness of the finish, nor is any joint visible. The illustrations show a number of bodies in course of construction, some of which are in the skeleton stage, while others have been given their sheathing of aluminum.

A rough coat of paint and the body is sent down to the blacksmith's shop in the lower depths, where it is strengthened and bound with metal stays. The amount of strengthening and the position of the stays depends entirely on the nature of the body, whether it is open or closed, whether it will carry a hood or be uncovered, and finally the type of hood used.

How the Upholsterers Make a Transformation.

Up-stairs it travels, to the well-lighted paint shop under the roof, where the preliminary filling coats are applied, coming



WOOD AND ALUMINUM BODY UNDER CONSTRUCTION.

TOURING BODY AWAITING ITS METAL STAYS.



WHERE THE UPHOLSTERY IS PREPARED.

FITTING A SUIT OF CLOTHES TO A FIAT.

down a few days later to be transformed by the upholsterers. Preparations have been made for its arrival, much of the upholstery is already mounted on canvas stretched on large wood frames. One of these is shown in the illustration and is the upholstery for the rear seats of a big touring body. The canvas is cut out of its frame and the complete piece fitted in position on the car. The finest quality of curled hair is used in this work, the covering being either hand buffed leather or various kinds of cloth, according to the nature of the car for which it is intended. Operating as carefully and as critically as a Worth dressmaker, the upholsterer fits the leather or cloth panels, upholsters arm-rests and various parts for which material cannot be made in advance, transforming the bare wood body into a luxurious, well-padded interior, pleasing to the eye and restful to the body.

By this time the chassis will probably have arrived. It is at once sent up to join its companion; the two are bolted together, and any modifications in detail which may seem necessary in order to obtain perfect harmony are here attended to. Now the painter comes on the scene. Filling stuff, rough coats, color coats, succeed one another in quick succession, each one being rubbed down until the previous coat shows through. Altogether a high-class body receives anything from seventeen to twenty coats of paint. The average is eighteen, but the exact number depends on how the finish comes out. If when the final operations are arrived at the body has not a glossy finish to suit the critical foreman, it is passed over and rubbed down again, until

the surface is as smooth as glass. Last of all the varnishing coats are given. A specially prepared room, with double floors, walls and roof, having varnished paper between them, is reserved for this delicate process. Automobile and workmen are left together in perfect stillness, no one being allowed to go near them and not a sound being uttered or an unnecessary movement made.

Finishing Touches to an Elegant Toilette.

Although practically finished when the machine leaves the varnishing shop, there still remain a number of small attentions which give a finishing touch to the creation. Mudguards and other fittings have been prepared and assembled as the work on the machine advanced, and are fixed at the last moment.

Even now the work is not terminated, for every self-respecting body must have a suit of clothes, a suit made of waterproof material, cut and fitted on the body itself. It is the only way to get a good fit; the workman operates with scissors and needle, cutting out here, taking in a stitch there, in much the same manner as a conscientious tailor would operate upon his clients, could he find any with sufficient patience to submit to such treatment.

Ninety-five per cent. of the work in the Locke & Co. factory is for automobiles. Here and there a horse carriage is being built side by side with an automobile body, and some rather instructive contrasts are formed by the juxtaposition of horse buggies of doubtful age with a coterie of automobile bodies of the first blood. There is a large amount of work, too, on retouching and repainting cars.



A GENERAL VIEW IN THE PAINT SHOP, WHERE EACH AUTOMOBILE RECEIVES TWENTY COATS.

HORSEPOWER IN RELATION TO MOTOR DIMENSIONS*

By F. W. LANCHESTER.

WHEN we discuss relative importance of bore and stroke as determining the h.p. of an engine, we have to consider the question of engine speed as limited by inertia and the strength of the materials employed. We may either suppose the maximum to be reached when the material is stressed up to its elastic limit by the inertia of the reciprocating parts, or at some stated point short of this extreme. In any case, the first step in the solution of the problem is the determination of the mass of the reciprocating parts in terms of the bore and stroke, in order that the conditions of σ (stress) = constant may be ascertained.

It is evident that to support a given pressure the piston end will require to be of a thickness proportional to its diameter; this applies whether the form is flat, or conical, or whatever its shape; its mass will therefore vary as D^3 . The piston ring, with its containing "junk" is also a part that evidently should preserve its geometrical proportion; its mass is, in any case, independent of the stroke, and therefore varies as D^2 . The small and large ends of the connecting rod are also unaffected by the stroke, and their linear dimension requires to increase directly as D ; the same applies to the gudgeon pin and the lugs and belt of metal, by which the connecting rod stresses are taken by the piston; the mass of all these parts, therefore, varies as D^3 . The only remaining portions are: the shank of the rod, which evidently varies as $D^2 \cdot S$; and the "shell" of the piston, which is a rather doubtful quantity. If we assume that the length of the piston varies in the direct ratio of its diameter, then this also falls into line with the majority, and varies as D^3 ; this probably is not exactly true, but very nearly so.

We thus have the shank portion of the rod varying as $D^2 \cdot S$, and the remainder of the major reciprocating parts as D^3 , and as the shank only constitutes about .15 of the total mass, I propose to ignore the exception and take the mass of the reciprocating parts as a function of D only, and as proportional to D^3 . The error will be small, and such as it is it will favor the long stroke.

Let R = revolutions per second, then:—

$$\text{H.P.} \propto D^3 \cdot S \cdot R, \tag{3}$$

and maximum inertia force $\propto m \cdot R^2 \cdot S$; but this force is sustained by an area (the area of the rod), which varies as D^2

or stress varies as $\frac{m R^2 S}{D^2}$, but m varies as D^3 , so that stress

varies as $D \cdot R^2 \cdot S$, which, by the conditions, is constant. We can thus eliminate R in h.p. quotation (3) by dividing by the square root of the constant $D \cdot R^2 \cdot S$, and we get:

$$\begin{aligned} \text{H.P. varies as } & \frac{D^3 \cdot S}{\sqrt{D} \cdot \sqrt{S}} \\ \text{or, H.P.} = & c \cdot D^{2.5} \cdot S^{.5} \text{ or, } c \cdot D^2 \cdot \sqrt{D} \cdot \sqrt{S} \end{aligned} \tag{4}$$

where c is a constant.

In order to show the possible magnitude of error introduced by the neglect of the shank of the connecting rod, I have also worked the above calculation on the basis of m varies as $D^2 \cdot S^2$, which seems a sufficiently liberal allowance; we have:

$$\begin{aligned} \text{Stress varies as } & D \cdot R^2 \cdot S^{1.5} \\ \text{H.P. varies as } & \frac{D^3 \cdot S}{D \cdot S^{1.5}} = D^{2.5} \cdot S^{.5} \end{aligned}$$

so the influence of our assumption is not, at most, very serious. As a rating rule I should feel disposed to support any values lying between $n=1.5$ and $n=1.6$ in the L^2 law of § 5. Any value

*Paper read before The Institution of Automobile Engineers, London. Continued from page 742, issue of May 2.

between these limits would not leave much opening for a "special design." For the further purposes of the present paper I employ the form $D^{1.5} \cdot S^{.5}$.

Conditions of Least Weight.

It is evident that for any given type of design, there must be some particular proportion of stroke to diameter appropriate to the condition of *least weight*. By the term *type of design*, as here used, it is intended to convey the condition that, in different engines, the arrangement and function of the parts is identical, the parts compared each to each are situated in the same relation to each other, and are alike functionally.

The *proportion of least weight* may be different in engines designed on different plans; for instance, one engine with an open and another with a closed crank chamber; it may also be different where different materials are used for like parts of different density or thickness.

In order to determine the proportion of least weight for any given type, a trial design is first made, preferably about the proportions that are known to be near the mark. This design is then dissected into its functional components after the manner in which we treated the piston and connecting rod, and the weight of each component is separately considered as a variable, and expressed as a function of D and S . The results are then classified, all functions of like indices being lumped together, and the total weight calculated from the trial design is added up under each heading.

Either D or S is then eliminated (preferably the latter), by dividing by the appropriate power of the h.p. factor $D^{1.5} \cdot S^{.5}$, which is, of course, constant, and so we have the weights of the different functional components expressed as functions of D alone, the total weight being the sum of the expression.

The next step is to differentiate in respect of D , and solve the resulting expression in the usual manner for zero value; the value of D so obtained will be the value appropriate to *least weight*. The corresponding value of S will then be obtained from the constant $D^{1.5} \cdot S^{.5}$. The final design for least weight can then be made.

Influence of Density and Stress on H.P. Developed.

We will now revert to the general expression (1) of § 4—

$$\text{H.P.} = \frac{\sigma^{1.5}}{\rho^{.5}} \cdot l^2 \times \text{constant} \text{—and discuss the influence of changes}$$

in the physical attributes of the materials employed; *i.e.*, variations of σ and ρ .

Translated into ordinary language the expression (1) shows:

That in similarly-designed engines, the h.p. varies as the 1.5th power; that is, as the cube of the square root of the stress, and as the square root of the density of the materials employed.

Now it is evident that the weight of the engine also will depend upon the variables p and l , and for the conditions of geometrical similarity the form of this expression is $W = p \cdot l^3 \times \text{constant}$; (5) so that the h.p. per unit weight, which is the quantity which is

H.P. of most interest to us— $\frac{\text{H.P.}}{W}$ —will be:

$$\frac{\sigma^{1.5} \cdot l^2}{\rho^{.5} \times p \cdot l^3} \times \frac{\left(\frac{\sigma}{\rho}\right)^{1.5}}{l} (\times \text{constant}).$$

Let us denote the quantity $\frac{\sigma}{\rho}$ by the symbol O , and term it

the "specific strength" of the material; then we have:

$$\frac{\text{H.P.}}{W} = \frac{\phi^{1.5}}{l}$$

We have now the question of weight-saving in a nut-shell. The above expression shows that to which I have already drawn your attention—the importance of sub-dividing the power unit by employing a multiplicity of cylinders of individually small size, for we have the *h.p. per unit weight inversely as the linear dimension*, the latter, *l*, being the denominator in the above expression. We can also see at once the importance of employing materials of high *specific strength*; the form of the expression shows that if we can, by employing *all round* a higher grade of material, say of 10 per cent. greater specific strength, we shall effect a saving of weight of approximately 15 per cent.

Of course, it is not always possible to effect an improvement in the quality of the material in every part of a machine, and it is of considerable interest to us to ascertain where and how the saving in weight is most usefully effected.

Weight Saving Considered in Detail.

Let us, to fix our ideas, suppose that we have at our command two kinds of material, one of which has just four times the *specific strength* of the other; and let two carefully-designed engines be built to the same specification, one from each kind of material. Now it is evident that, part for part, the one engine can be built one-fourth the weight of the other. There may be some slight difficulties in design, owing to the slenderness of some of the parts, but we can brush this difficulty to one side by supposing the difference of *specific strength* to be wholly due to a 4 : 1 *difference of density*; that is, σ remains constant.

$$\text{H.P.}$$

So far we have accounted for the $\frac{\text{H.P.}}{W}$ varying in the direct

ratio of ρ only; but the one engine will not only be lighter than the other, but it will develop more power, for its reciprocating parts will give rise to less inertia and the revolution speed can be increased. The extent to which the revolution speed can be increased is in the inverse ratio of the square root of the weight of the parts, or in the case in point, the revolution speed can be doubled. Thus, the h.p. of the lighter engine will become

$$\frac{\text{H.P.}}{W}$$

twice as great as the heavier one, or its $\frac{\text{H.P.}}{W}$ will be 4×2 ; that

is, eight times as great, which is $4^{1.5}$ in accordance with the equation.

We thus see that on the former supposition of a 10 per cent. improvement in the material, producing (approximately) a 15 per cent. improvement in the power-weight factor, 10 per cent. of this improvement is due to the direct lightening of the engine and 5 per cent. to the increased power derived from the higher revolution speed rendered possible.

It is thus evident that by far the greater importance attaches, relatively speaking, to the quality of the material employed in the pistons and connecting rods, for these reciprocating parts do not usually exceed 10 per cent. of the total weight of the engine and attention given to this 10 per cent. is of as much effect as similar attention devoted to any other 50 per cent. of the engine. It is thus found advantageous to adopt the very highest class of material for pistons and connecting rods. For some years past I have employed a high grade of nickel steel, both for the connecting rod stampings and for the blanks from which the pistons are turned, and I believe that the results would justify even more attention still, being paid to the reduction of weight in these organs.

A Secondary Effect.

There is a secondary effect which must not be lost sight of, and which results in a saving of weight which is not obvious from a mere inspection of equation (6).

We have seen that the change in the power-weight factor, as due to $\phi^{1.5}$, takes the form of a saving of weight in the direct ratio of ϕ , and in an increase of power in the relation $\phi^{1.5}$. But we may not want increased power; it is usually some stated power that is required, so that by equation (1) l^2 will require

to vary inversely as $\phi^{1.5}$; that is, $l \propto \frac{1}{\phi^{.25}}$, substituting in equation (6) we have:

$$\frac{\text{H.P.}}{W} \propto \phi^{1.75}$$

under the conditions of stated h.p.; that is to say, h.p. = constant. This may be alternatively expressed by saying that for a given h.p. (for an engine of given number of cylinders), the weight varies *inversely*, as $\phi^{1.75}$.

The equation (1) may be written in the form:

$$\text{H.P.} = \sigma \cdot \phi^{1.5} \cdot l^3 \times \text{constant.} \tag{7}$$

In this form the σ relates to the stress in the working fluid; that is, the cylinder pressure; taking this as constant we have h.p. varies as $\phi^{1.5} l^3$, and when h.p. is constant, we have $\phi^{1.5} l^3 =$

constant, or, $l \propto \frac{1}{\phi^{.25}}$, which, substituted in equation (6),

gives the same result as before; *i.e.*, $W \propto \frac{1}{\phi^{1.75}}$.

We thus see that the saving of weight, to be effected by employing high-grade material, is even more than we had hitherto concluded, so that a 10 per cent. higher specific strength would give about 17.5 per cent., instead of 15 per cent., as previously concluded. The earlier figure was perfectly correct so long as the linear dimension is the constant, instead of the h.p.

Conditions of Least Weight—Continued.

The present method of investigating the proportions of *least weight* is comprehensive, and includes such appurtenances as ignition mechanism, fly-wheel, etc., and may even be extended to include the whole power transmission and change speed gear.

Under these circumstances, it is evident that there are certain factors that may be ignored as being independent of the variables *D* and *S*; for example, the ignition organs, the valve heads, portions of the valve boxes, etc.; that is, (a) parts that are *essentially constant* (example, *sparking plugs*), and (b) parts that are constant in respect of h.p.; that is, vary as $D \sqrt{D} \sqrt{S}$ (example, *valve heads*), and which consequently would vanish automatically in the process of calculation. As a general rule, in practice the whole of the valve and ignition gear may be thrown out at the start, though there may be exceptional cases in which parts of the valve gear must be taken into account.

(To be concluded.)

SOME OF THE USES OF ANTIMONY.

Antimony is a white metal which fuses at a low temperature and is readily vaporized, says the *Canadian Engineer*. It is of a laminated or crystalline texture and is very brittle. It is used in several valuable alloys, but is not used in the pure state; its most important alloys are type metal, britannia metal, pewter and various anti-friction metals. Type metal consists essentially of lead and antimony, with, frequently, the addition of tin, nickel or copper in small quantities. Britannia is a white-metal alloy much used for tableware, and consists of antimony, with tin, copper and bismuth. A similar alloy, containing, however, a smaller percentage of antimony, is pewter. The anti-friction alloys usually are known as babbitt metals. One of them consists of thirty parts of tin to five antimony and one of bismuth, but as is well known, various proportions are employed. Antimony has a hardening effect when added to lead; a small quantity of bismuth gives the alloy the property of expanding at the instant at which it solidifies, the result being a perfect cast from the mold.

TYPES OF AUTOMOBILE TRANSMISSIONS*

By E. H. BELDEN.

AT the outset it will be necessary to give some definition of transmission, which is one of the most improperly applied words in connection with the automobile industry. It is understood to mean, generally, change-speed gearing. In other words, the change of ratio and direction of motion between the rear wheels and motor, but that mechanism is only one element in the train of devices, which transmits the power of the motor to the road wheels. So, therefore, we will designate the change-speed gearing as the "gear-set," and leave the word transmission with a broader meaning, to apply to the entire moving mechanism between the motor shaft and the road wheels.

The available energy, at the road wheels of the automobile, is transmitted from the engine through what is commonly known as a "transmission or gear set." The gear set may be one of many types, but in any case it must perform the office of changing the direction and ratio of motion, between the engine and road wheels, at the option of the operator. Means must be provided for the compensation of the relative motion between the driving axle and frame of the car, to allow for the use of suitable spring suspension, without interference to the uniform transmission of motion. Compensation must also be provided to allow one road wheel to operate independently of the other. Connecting and disconnecting of transmission devices, from the motor, must be accomplished in such a manner that the car may

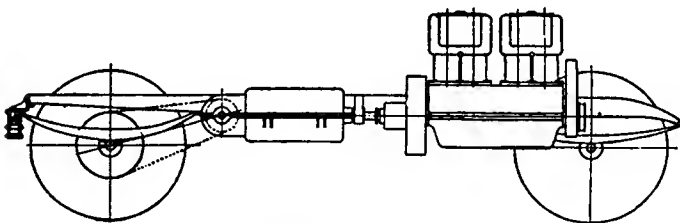


FIG. 1.—Usual arrangement of double chain drive.

be set in motion without shocks, sudden jerks, or danger of stalling the motor.

Let us now leave out of consideration the advantages or disadvantages of any particular type of "gear set," to which we shall revert later, and take up the advantages and disadvantages of two methods, *i. e.*, the transmission of motion from engine to road wheels by chain and by propeller shaft.

The Double Chain Type.

During the early days of automobile designing it was considered desirable by the majority of the best engineers to use the double chain drive, as shown in Fig. 1. The chain drive was considered to be the more flexible, because the spring action was not deadened by the use of short propeller shaft, as shown in Fig. 2. The speed ratio could be easily changed by changing the size of the sprockets. It was considered to be the more efficient, because of the low efficiency of the bevel gears, when they were forced to transmit the enormous multiplied power of the larger engines. The frame could be hung lower when the double chain drive was used, because the solid rear axle could be dropped the same as the front. In the double chain type of transmission all of the gears, including the bevel, were relieved of the greater strains on account of the ratio of the sprockets.

The principal disadvantages of the chain type are the constant stretching of the chain while the pitch of the sprockets remains the same, producing shocks and noise as the teeth come in con-

tact with the chain rollers; the inability to provide suitable means for protecting the chain and sprockets from dust and mud; the excessive strain on the bearings of the road wheels caused by the pull of the chains, and the deadening effect on the springs caused by the angle of chains and distance rods. There are now being put upon the market three or four types of cars that are provided

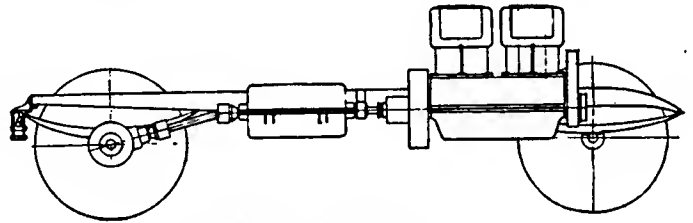


FIG. 2.—Power-wasting angle of shaft.

with cases to protect the chains. In each instance the construction of the chain cases are so unmechanical that there can be no doubt but what the propeller shaft will soon antiquate the chain type.

The mere fact that the manufacturers of automobiles, with the double chain drive, are forced to provide their cars with chain casings that cannot possibly prove of advantage to this type of transmission, for the reason that they are only a makeshift, expensive to build, unmechanical, only partially dust-proof and subject to the danger of being totally destroyed every time the chain breaks, is sufficient proof that this type of transmission is far from the ideal.

Propeller Shaft Type.

Now that the trend of automobile designing has been constantly away from the chain types, we must admit that the bevel gears have been perfected, both in material and design, to such a degree that their efficiency and durability is equal to that of the chain type when operated under road conditions. Bevels can be changed to alter the ratio as readily as changing the sprockets and the lengthening or shortening of chains. The matter of lowering the frame has been taken care of by the use of a drop frame, as shown in Figs. 3, 4, 5, instead of a drop axle. The propeller shaft transmission has an advantage over the chain type of being completely enclosed, protected against dust and mud and always well lubricated. This enclosed transmission maintains constant efficiency and is practically noiseless.

The sliding "gear set," as shown in Figs. 6, 7, 8, has an average efficiency of about 78 per cent. The "transmission" efficiency (*i. e.*, the efficiency of all moving mechanism between the motor and wheels, including cardan joints), with the gear set between

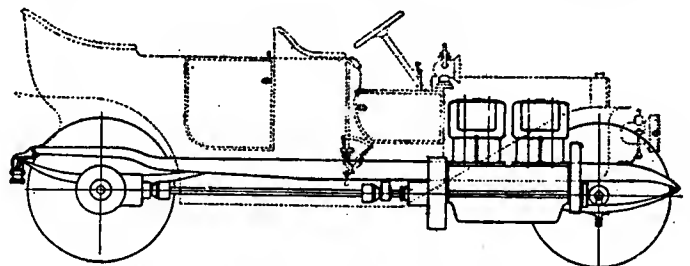


FIG. 3.—Shaft drive with gear box on rear axle.

the propeller shaft and motor, as shown in Fig. 2, has an average efficiency of about 67 per cent., while the average transmission efficiency of the more modern car, using the propeller shaft type, with the transmission in the rear axle, with no multiplied power in the cardan joints, is 88 per cent. The transmission efficiency

*Paper read before the Engineers' Society of Western Pennsylvania.

of the "Belden system," with no multiplied power in either the cardan joints or bevel gears, as shown in Fig. 3, is 98 per cent.

After comparing carefully a number of efficiency tests on both the chain and propeller shaft types, we find that the chain type, when the chains are new, clean and well oiled, has about ten per cent. more efficiency than the propeller shaft type when

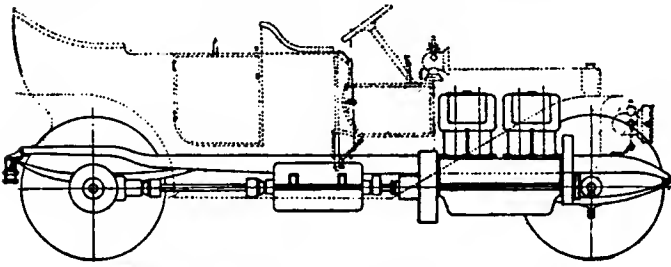


FIG. 4.—Design of shaft drive for maximum efficiency.

the shaft is placed at a great angle and forced to transmit the multiplied power of the gear set. But comparing the chains on modern cars under ordinary working conditions, with the chains exposed to mud and dust, as they usually are, and the propeller shaft type with the transmission in the rear axle, thereby eliminating the great angle of the shaft and the multiplied power in same, we find the efficiency decidedly in favor of the latter type, as is naturally to be expected under the circumstances.

Power Loss.

Engineers are agreed that the greater part of power loss of the transmission of motion in automobiles is in the propeller

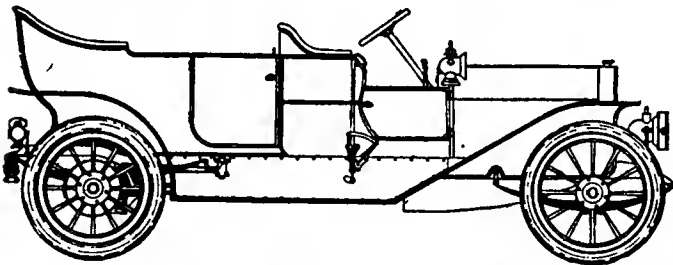


FIG. 5.—The Belden 30-horsepower car.

shaft and cardan joints, due altogether to the friction of the cardan joints when transmitting power at a great angle, as shown in Fig. 2.

Now, considering the fact that bevel gears are inefficient when under excessive strains, we must come to but one conclusion. The automobile of the future will be built on the lines of the car shown in Figs. 3-5, with the motor set back of the front axle. With the motor shaft in line with the rear axle (which will eliminate all loss of power in cardan joints); with large wheels to increase road clearance and decrease road shocks, as well as road resistance; with drop frame for the purpose of keeping the center of gravity low.

With "gear set" placed in the rear axle, for the following reasons:

First. To eliminate the transmitting of the multiplied power of the gear set through the propeller shaft and cardan joints.

Second. To allow sufficient road clearance midway between the front and rear axles, which could not be possible if the gear set is placed under the body, as shown in Fig. 4.

Third. So that the multiplied power will not pass through the bevel gears, but pass through more efficient gears, as arranged in the Belden type of transmission, thereby eliminating the inefficiency of the bevel-gear drive.

(To be continued.)

[EDITOR'S NOTE.—The illustrations referred to under the paragraph captioned Propeller Shaft Type, and denominated as Figs. 6, 7 and 8, picture change-speed gears of the different standard types and were necessarily held over to the second part.

FUEL CONSUMPTION IN MOTOR 'BUSES.

London omnibus companies using gasoline vehicles have discovered to their cost that there is an enormous waste in fuel owing to the inexperience of the drivers they are obliged to employ. A writer in *Le Poids Lourd* says that he has made consumption tests on a number of London 'buses, using a gasoline indicator on the main feed pipe, and is of opinion that one company having 100 vehicles in service has a loss of \$30,000 annually. Certain 'buses of a uniform type, and on the same roads, showed differences in fuel consumption reaching 42 per cent.; drivers in each case were equally capable.

The driver alone on a given car could vary the fuel consumption 25 per cent. per machine kilometer. This shows the need for constantly verifying the fuel consumption for each motor in order to maintain it in the most effective condition. The regulation of the carbureter should always be entrusted to an expert and should never be left for drivers and mechanics to do on the road. Too often the men remedy a loss of power by enlarging the hole in the *gicleur* and some have been known to use the pointed end of a file for this delicate operation.

Every motor 'bus repair shop should be fitted with the necessary instruments for testing not only the power developed but the fuel consumption per horsepower per hour. If these tests were thoroughly carried out every time a motor is dismounted for repairs a great saving would result. Drivers, most of them recruited from the ranks of horse drivers, do not sufficiently understand the mechanism of their machines. The disastrous effects on the consumption when a 'bus is stopped and allowed to run simply with the clutch withdrawn, should be pointed out to them; at such a time the gasoline consumption is higher than if the machine were running at its maximum speed. He should be made to understand that to restart his motor it is not necessary to flood the carbureter until gasoline runs onto the ground. He should be taught to throttle down gradually before stopping so as to have no need to use the brakes harshly. Another important point on which he should be instructed is the effect on the fuel consumption from an abuse of the change speed gear.

Generally motor 'bus drivers travel too fast. Often the last journey is a wild rush through deserted streets, the driver and conductor being only concerned to accomplish the stipulated number of journeys. A system of payment by journeys is better than payment by day, but it has its disadvantages; frequently passengers are left behind who would be able to board the 'bus if it were traveling at a moderate speed. A bonus system on fuel consumption, as is in use by railroad and steamship companies, should be introduced by gasoline omnibus companies. In Paris, where the high price of gasoline renders economy essential, each gasoline cab driver is allowed a fixed sum off his daily takings for fuel. Whatever he can economize by skillful driving is to the driver's personal benefit; naturally if the motor is at fault the driver speedily remedies the matter himself or causes the regulation to be made without delay at the repair shop.

ILLUSTRATING THE WORKING OF A CHAIN.

Hans Renold, Ltd., Manchester, showed at Olympia the latest improvements in silent driving chains, in which the links are not allowed to bear directly on the rivets, but carry removable hardened bushings which turn with the links, says *Engineering*. This arrangement gives to the rivets a bearing the full width of the chain. In order to demonstrate the principle embodied in the construction of these chains, this firm had an electric motor driving by means of a sprocket wheel and chain, an idle chain wheel on one side of the motor, and on the other side of the motor the disks of a stroboscope. The main chain is of the silent pattern. The transverse shaft carrying the stroboscope is fitted at its remote end with an arm bearing an eye-piece on a level with the slots in the disk, the slots being in line with the chain links and the wheel teeth. Viewed through the eye-piece, and when in motion, the teeth and chain appear practically at rest, and the positive contact between the two is shown in a very clear manner.

CONSIDERED IN THE BUYING OF A SECOND-HAND CAR

By CHARLES B. HAYWARD.

IF a locomotive or a marine engine has a useful life of anywhere from ten to twenty-five years before finally being relegated to the scrap heap, why is it that an automobile reaches the same haven of rest in a mere fraction of that time? is a question very commonly asked. Or, to put it in a slightly different form: Why is it not possible to buy a second-hand automobile with the same assurance that any other piece of machinery could be bought in the open market? It is evident that the questioner places the automobile in a special category by itself, and to a large extent this is true; just why it should be so, is another matter entirely.

As a business, dealing in second-hand automobiles sprang up contemporaneously with their entrance into daily life—as soon as there were new automobiles, there were second-hand cars. Probably a man has to be pretty shrewd to sell anything at second-hand and make a living; at any rate, a second-hand dealer is always a second-hand dealer, whether his specialty be old clothes or automobiles. Paint and varnish are cheap, while talk is evanescent and only remembered by the buyer when he discovers his purchase to be something quite different from the glowing account of the salesman—the latter seldom remembers having promised anything of the kind. But how about buying a car that has been used from its original owner?

Many Things to Be Considered.

Of course, all dealers are not dishonest by any means, nor given to making ambiguous statements, such as the automobile equivalent of David Harum's assurance to the clerical buyer of his horse that "he would stand without hitchin'." Whether dealer or individual seller, the statement that the car is "in good condition"—the "best of condition" or its equivalent is bound to be forthcoming. It is utterly meaningless, and may be disregarded, or at least not given any more weight than the grocer's statement when he makes the assurance that the eggs he is selling are "fresh laid"—he may have just laid them on the counter.

No car that has been used one or more seasons can be expected to be in the pink of condition—it is never that way but once, and that is when it is brand new, but given a good foundation to start with and reasonably decent care during its period of use and there is no reason why a secondhand car cannot be considered as an excellent investment. Depreciation is the greatest bugbear of the automobile owner—his new car loses 20 to 25 per cent. of its original value every year; it goes out of style and drops further and further down the price line with the passing of each season. Now this is not actual mechanical depreciation—after two years' use it is practically impossible to sell a car for more than 50 per cent. of its list price, but its actual depreciation with fairly good usage should not exceed 15 per cent., and much of the latter may be remedied by replacement and repair. It is still a good car, and can be had at a comparatively low price, but the buyer of a second-hand car expects to get a good one for next to nothing. There's the rub—alluring prices attract him far more than mechanical soundness. Next to expecting to become the owner of a big car—the second-hand buyer is always looking for the most for his money in the shape of size—the chief cause for dissatisfaction lies in the fact that he expects his purchase to be in a condition to take the road immediately and keep it. It usually does by showing a decided affection for a certain particular spot on the highway where it persists in standing without being hitched.

Slight Defects and Ordinary Wear Immaterial.

Bearing in mind that it is not reasonable to expect to buy a car second-hand that will look or act as if it had just come out of the factory, due allowance must be made for ordinary wear and tear—what may aptly be termed legitimate wear. Mudguards,

headlights and the radiator form excellent indices of the manner in which a car has been used; if it has tried conclusions with sundry obstacles off and on, these parts will reveal it, and they may be taken as an indication that the remainder of the car has not come in for any greater degree of consideration. Naturally there is bound to be a great deal of wear where it cannot possibly be seen—in the motor itself, but the manner in which the latter operates will show whether it is such that a little overhauling will make it good or whether it has damaged to an extent that an outlay for repairs would be money wasted.

Observe the motor closely while it is running with the car standing—it may have an ominous knock in its interior; it may clank, sigh, hiss and groan as it labors, but these signs of infirmity need not necessarily condemn it. A loose big end or piston pin will cause one and leaky, poorly adjusted valves be responsible for the other, while worn out piston rings may account for the fact that the power developed is not all that it should be. Unfortunately, the average seller of a used car is not disposed to let the intending purchaser take it down for inspection, but much can be done by observation of its actions. The interior of the change-speed gear box can be inspected as well as the interior of the bevel-gear drive in case of the shaft-driven car, and the differential in either case. These parts are expensive to replace, and under abuse are short-lived, but with reasonable care are usually good for years of service. The object to be borne in mind throughout the entire inspection is whether, all things considered, the car is in such a shape that a reasonable outlay will render it fit for continued service.

Make a Note of Repairs Needed.

To arrive at this conclusion, a note should be made of every repair and replacement that is needed. It is obvious that a car in which the gears are badly stripped, the differential worn and the motor in need of a number of replacements, is not a good investment even at a very low price. The wheels should be removed and the condition of the bearings noted, and care should be taken to see whether the wheels track or not, as the rear axle unit is an infirmity of many a low-priced shaft-driven car. After a season's use many of them are hopelessly out of true, wasting a large percentage of the power and wearing the tires unevenly, and while the repair required may not be an expensive one, making a good job of it is apt to be so, as the trouble is the result of inherent weakness that is bound to crop out again. It goes without saying, of course, that when the purchase of a used car is in question, only one of a well-known standard make should be considered. Many old cars find their way into the second-hand market for no other reasons than the fact that their owners have purchased others of a later model, but there is also an eternal crop of failures that end up in the same place. They were hopeless at the outset, and no amount of tinkering can better them; they should be avoided as the plague, and particularly because they are frequently offered as "brand new, never run," which, of course, is a fact, but one that should put the buyer on his guard.

In no other field does the ancient maxim of law *caveat emptor* apply with greater force. Let the buyer beware! If the seller gives an absolute warranty that the machine is in a certain condition of fitness, he may be held responsible, but sellers are wise individuals, and much of what the average buyer construes as a warranty is nothing more than mere puffery—the seller's inflated opinion of his own merchandise—and is so considered by the courts. It is just as well to disregard the seller's laudation of his wares *in toto*; the car itself will tell its own story to the experienced eye, and the intending autoist who knows little or nothing about automobiles will find this a roundabout way of saving money unless he goes accompanied by some one who

knows the ins and outs, and is not retained by the other side to sell a car.

Some of the Would-be Buyers' "Don'ts."

Of course there is a whole category of *don'ts* for the man about to purchase an automobile, whether it be new or otherwise, but, like most admonitions, they do not carry a great deal of weight as a rule. There are a few of them, however, that may well be borne in mind, and the first is not to be misled by the appearance of a car. Refinishing its exterior is a far less expensive and far less important item than providing it with new mechanism or other essentials. The car with the shabby appearance gained in a season's legitimate wear is apt to prove far better than the creak of ancient vintage that has been rehabilitated to look like new. Some people are so gullible that a second-hand dealer could sell them a good looking car without any *works* in it at all. It seems to be impossible to avoid referring to the man who makes a living at selling cars that have been discarded by their original owners in discussing the matter of buying such a vehicle, and while on the subject for the moment it may be as well to cite an instance or two of his knavery—only the unembellished facts being given in each case.

For ways that are dark and tricks that are vain, some second-hand automobile dealers have Bret Harte's heathen Chinese "*faded*," to use an expressive bit of vernacular. If the car had existed in the days of the when-is-a-thing-not-a-thing conundrum, the answer to when is an automobile not an automobile? would have been when a second-hand dealer has it for sale. Take instance number one—the misleading for-sale ad. in a daily paper furnished the *come-on* as usual and under the blandishments of the salesman the purchaser became the happy possessor of a car that was guaranteed to be the 30-horsepower model of a well-known maker who failed only a year or so before; in absolutely first-class condition, and good for 30 miles an hour anywhere on the level. The dealer simply hated to take the money for it, so good was the car, but under compulsion was willing to accept about six to eight times what it was worth. The next day the newly-made autoist invited his friends for a ride in his new acquisition, and after getting fifteen miles out at the rate of something nearer three than thirty miles an hour, paid his friends' carfare home and a truckman to tow the car back. Within twenty-four hours later the deluded buyer had found out what any well-informed autoist could have told him before he had been trapped. The car was a model of some four years previous, and had never been anything but a failure. It had a 40-horsepower body and chassis and a 10-horsepower motor to pull it.

The second case was, considerably worse, in that the buyer was a trained machinist, unfamiliar, however, with automobiles. The car was one of the best known of French makes, selling at a high price when new. It was offered at a fraction of its original cost, and guaranteed as having only been run a few thousand miles and as being the model of the year previous. To make a long story short, the car was three years old, and had been abused so that there was scarcely a perfectly sound part in it—which the new owner found out from its original possessor a short time *after* he had parted with his money for it. An electric that was sold as being but a year old and good for thirty miles on a charge, and in good condition, proved to be three years old likewise, with single tube tires that could not be made to hold air, and not good for more than six miles a charge at the most.

The Other Side of the Question.

Instances like the foregoing could be multiplied indefinitely, but there is no necessity for it. They are not cited to discourage the intending buyer of a used car, but simply to put him on his guard, for there is a totally different side to the question, and with the exercise of due care and discretion, considerable money can be saved by investing in a used car. The number of cars of well-known makes that are discarded simply because their owners have become the possessors of others of higher power or later model is legion. A very large proportion of them have been carefully maintained, and even in the condition that they are

offered for sale are capable of immediate running and good service for some time to come. The fact that it will invariably prove more expensive to maintain an old car than a new one must always be taken into consideration, and the question to decide before making the investment is whether the car is in such a condition that the expense of maintenance and repairs is going to prove such as to effectually wipe out any saving that may be made on its initial cost.

It must be remembered that on a used car of whatever make and regardless of its original *quality or standing*, there are always pieces that have seen their best days and will sooner or later need replacement. It depends upon how many things are just about on the point of giving out in a car that will decide whether it is a good investment at second-hand or not. The man who is fond of tinkering and has the facilities and time for the work will be able to take advantage of what would be considered little more than a wreck by the average buyer, who would be unable to get any service out of it except on the payment of an excessive outlay for repairs. Not many autoists are so situated, however, so that this is really an exceptional instance or class of buyer who need not be considered in this category at all.

Figure up as closely as possible what these repairs and replacements are going to cost, and as a much needed factor of safety in such calculations multiply by two. The result should be added to the selling price of the car before its availability is considered. Naturally the seller will be quite positive that either no repairs whatever are needed, or that the car can be *thoroughly overhauled* for a nominal sum, say \$25 or so. Let these things go in one ear and out the other as fast as they will travel, and don't take any stock in the thorough overhauling that is promised. It has been italicised here because it may mean anything from rubbing the outside of the motor off with a piece of waste to cleaning the spark plugs.

To properly overhaul a motor it must be dismantled; transmission ditto, rear-axle unit, steering and running gear likewise; when all these parts have been taken down, carefully inspected after cleaning, due replacements made and carefully adjusted and reassembled, a car can be said to have been overhauled, but it is the better part of a week's job for two good men, or at least one good man and a helper. Not one repair shop in ten would go to this extent in fixing up a car when merely directed to give it a thorough overhauling—it was done earlier in the game, but the customer usually howled long and loud at the size of the bill, so that now such things are only done to special order. It is easy to see that such a job cannot be done for a nominal sum. The thorough overhauling that can be done for a few dollars consists in cleaning things up generally from the *outside*, taking a look at the valves, timer and carbureter and seeing that the motor will run of its own accord for more than five minutes at a time. The size of the repair bill in a case where a genuine thorough overhauling is undertaken depends not alone on the number of hours put in by the two good men, at 60 or 70 cents an hour—and to the man who has to foot the bill they move exasperatingly slow—but also on the replacements that will be needed. Just what these consist of cannot be told until the motor is all in pieces and the condition of its parts is ascertained. New babbitt bearings may have to be poured or new bronzes fitted, new piston rings fitted, new valves, new valve springs, and what not else in the shape of small parts, as well as that of other replacements needed—they all add surprisingly to the bill, but with a fairly good car their cost should be covered by the calculation already referred to.

Given a car of reputable make to begin with and one that has not been unduly abused or that is so old as to have passed the limit of economic usefulness, there is no reason why it should not prove a good investment at second-hand. The buyer must make up his mind to spend at least 10 to 15 per cent. of the purchase price in putting the car in good shape, and unless the car is to be had at a very low price, this appropriation should not include more than one new tire, though it should cover retreading and spare inner tubes.

LETTERS INTERESTING AND INSTRUCTIVE

A Peculiar Case of Smoking and a Remedy Therefor.

Editor THE AUTOMOBILE:

[736.]—Will you please give me some information on the following:

I have a two-cylinder Reo car which makes a great deal of smoke when climbing a grade with the throttle almost wide open, but in traveling level road and when standing it makes no smoke. But when speeding up the motor and then throwing in the gear, it makes entirely too much smoke. Can you suggest a remedy?

Also, my engine misses quite frequently since I had one of the carbureters off to repair a leak. The missing occurs in the cylinder on which I removed the carbureter, but I did not move the adjustment of the carbureter at all. And when on the road it misses oftener with open throttle than otherwise and sometimes will slow down on opening the throttle instead of picking up speed. I discovered that both my carbureters will leak when engine is stopped if the valve under tank is not closed, but when engine is started it stops leaking. Would there be danger of it getting too rich a mixture on that account?

Aukenytown, O.

O. J. WORKMAN.

It would appear that under the conditions first mentioned as the cause of the production of smoke, that the latter comes from the fact that when mounting a grade all the lubricating oil in the crankcase of such an engine runs back into the rear cylinder and burns as long as the car remains in that position, as the rear cylinder will always have an excess supply of oil under such circumstances—or the forward cylinder when things are reversed by going down hill. This would account for the fact that no smoke is produced either on a level road or when standing. Both the foregoing and the fact that it smokes when speeding up the motor would appear to point to an excess supply of oil in the crankcase, and the simplest remedy is to ascertain the proper level and maintain it. Probably the adjustment of the feed cups or oiler has jarred loose somewhat and permits considerable more oil to enter the crankcase than was formerly the case.

Failure of the motor to pick up when the throttle is opened, or actual slowing down under such circumstances, usually point to defective air regulation. It is sometimes the case that when the throttle is opened the auxiliary air-valve remains closed and the mixture becomes so rich that it will not burn, also causing more or less smoke. The fact that the carbureters drip gasoline when the motor is stopped indicates that the float level is too high; the only reason the leak ceases when the engine is running is due to the fact that the gasoline is then being used up faster than it can come through the nozzles. To remedy this the height of the float on its spindle should be altered slightly; the level of the liquid in the float-chamber should be such that it is just slightly below the orifice of the jet. Yes, this would tend to make the mixture too rich at all times, as the gasoline would flow without depending upon the suction of the engine to start it and may account for some of the smoke. See that there is no air leak when the carbureter that was removed is fastened to the cylinder.

Explaining the Acetylene Explosion Mystery.

Editor THE AUTOMOBILE:

[737.]—Mystery of No. 636 is correctly explained by Mr. Covert, Number 703. Accident was caused by explosion of cuprous salt of acetylene, $C_2H_2Cu_2O$. It is a reddish-brown substance, insoluble in water, but decomposes by hydrochloric acid, with the evolution of acetylene. When dry it loses the molecules of water and becomes carbide of copper, C_2Cu , and when dry it explodes violently at $120^\circ F.$, or by friction (see Keyser, Remsen, Newth on Acetylene and Its Compounds). No doubt, if the editor of "The Automobile" would ask Dr. Keyser of Washington University, the authority on acetylene and its compounds, he would be glad to write an article, on either the prevention of the formation of this dangerous explosive in acetylene generators and tanks, or on its safe removal without injury to generating apparatus.

St. Louis, Mo.

E. T. SENSENY, M.D.

Your explanation of the mysterious explosion, set forth in letter No. 636, as well as that of Mr. Covert and others who have shed light on the matter, are of considerable general interest.

Why Are Two-cylinder Vertical Motors Not Used?

Editor THE AUTOMOBILE:

[738.]—Will you kindly tell me through your columns why the two-cylinder upright motor with valves is not used in automobiles. I have seen two-cylinder upright motors without valves, but none with them.

Newman, Cal.

BYRON PACKARD.

To put your question in a slightly different form, it would be: Why are not vertical, two-cylinder, four-cycle motors more generally used? The chief reason is because such an engine is not as well-balanced as a four-cylinder engine, either mechanically or in its impulses. The two-cylinder vertical motors you refer to as being without valves are of the two-cycle type. It just so happens that you have only seen examples of the latter, though, as a matter of fact, there are far more of the four-cycle type in use. However, they are seldom used except for city work, and are coming into demand more and more for this purpose. Hundreds of the gasoline cabs now in service, and more than a thousand that are building or to be put on the market abroad within the next year or two, are equipped with two-cylinder vertical four-cycle engines. They are mainly of French design and construction where motors of this type have been very much favored for light work. In earlier days some of the best known American cars employed the two-cylinder motor, but now there are not many.

Regarding Variable Inlet Valves and Steering Pivots.

Editor THE AUTOMOBILE:

[739.]—In your issue of April 4, "Angelos" inquires on page 587, "What American cars have variable inlet valves?" and you say you do not know of any American cars now on the market so fitted. Duryea vehicles have always been built with the variable lift valve, the valves being suction operated and prevented from lifting by the throttle slide. This arrangement insures the least possible action of the valve with consequent little hammering and noise. This saves destroying the valve and makes them very long lived. I have always used very light valves. A 1-4-inch valve weighs but 3 ounces and is closed by a spring that when the valve is closed has a strength of 8 ounces, and when the valve is opened a strength of 12 ounces. By careful adjusting of these valves each engine can be made to take a charge of such size that it will fire with the same strength as its neighbor, whereas a throttle at the carbureter may not permit such nice regulation. Further, the atmospheric pressure acts against the outside of the valve instead of against the outside of the throttle, some distance from the valve. This means that the engine will take fuller charges if throttled at the inlet valve than if throttled farther away. It is therefore quite essential for suction-operated valves that they also serve as throttles, and when so arranged speeds of 1,200 to 1,500 can be readily obtained, which is enough for long life. Doubtless "Angelos" will submit other reasons.

On the same page is an article on "cambering wheels" and you mention that steering is facilitated "by placing the point of support on the ground under where a prolongation of the steering pivot axis would strike." You do not mention, however, that the best way to get this result is to incline the steering pivot axis so that it strikes under the wheel instead of cambering the wheel so that it strikes under the axis.

CHARLES E. DURYEA.

Reading, Pa.

While for typographical purposes, the heading placed over the letter in question reads "Variable Inlet," the letter itself reads *variable lift*. Though we may be in error in the matter and are open to correction from those better informed on the subject, we have always construed *lift* to apply solely to a mechanically-operated valve, and took it that our inquirer had cars using mechanically-operated valves in mind when he asked the question. On that account we did not include the Duryea car in the category referred to, though had it been in mind at the moment mention would certainly have been made of its exclusive feature in this respect. As you are aware, the automatic type of inlet valve has all but disappeared from the automobile motor, and particularly from American cars, and has not been a usual feature of construction for two or three years past, so that it is not

at all strange that this type was overlooked in making the reply referred to. We are glad to call this exception to our inquirer's attention, particularly as he states therein that he is a strong advocate of the variable lift method of throttling.

We are also glad to call Joseph A. Kimber's attention to your further explanation with regard to the best method of inclining the steering pivot axis, so that it strikes under the wheel instead of cambering the wheel so that it strikes under the axis.

Balancing a Three-Cylinder Air-Cooled Motor.

Editor THE AUTOMOBILE:

[740.]—Being a close and greatly interested follower of the Letters Interesting and Instructive department of "The Automobile," I take this occasion to "butt in," and ask if you will kindly give me a little information.

A friend and myself are contemplating the building of a three-cylinder, 12-horsepower, air-cooled engine, of which we intend to buy the cylinders with the pistons and rings already fitted as well as the valves, also the crankshaft, and are having the aluminum crankcase cast. We realize that we can purchase practically the same engine in complete running order for less than it will cost to build it, but that is not the idea.

The stroke is to be 4.1-2 inches, giving a crank throw of 2.1-4 inches; the crankshaft with plain square web cranks set 120 degrees apart will be supported on four bearings. We are aware that such an engine is self-balancing as a whole, if each of the sections is of the same weight, but what we want to know is whether it will be necessary to attach counter weights to the "heels" of each crank to prevent any tendency toward an endwise "teeter." The engine is intended to be driven at speeds ranging anywhere from 200 to 2,000 r. p. m. You will confer a great favor by answering this question through your columns. H. W. CYRUS.

Astoria, Ore.

Assuming that the weight of each moving unit—i.e., piston, piston pin and connecting rod—in each cylinder be equal, a three-cylinder engine with the cranks set at 120 degrees, such as your design calls for, has an almost perfect mechanical balance, and as in operation a compression stroke in one cylinder will always be opposed to the working stroke of one of the other cylinders, the impulses will also be balanced to a considerable extent. In such an engine it is not necessary to use counter weights on the ends of the crank webs, as is imperative in the case of the single-cylinder type. Nor is it necessary to employ this expedient on either two or four-cylinder vertical engines for automobile or marine use, although an occasional instance will be found.

FUEL AND OTHER CALCULATIONS.

Editor THE AUTOMOBILE:

[741.]—I am enclosing several calculations relating to gasoline vapor as a fuel in the internal combustion motor which I think may be of interest. The basis of these calculations is as follows:

Temperature of hydrogen..... 8,259° C.
Temperature of carbon..... 2,468° C.

When burned in air, in accordance with Bunsen and others, therefore

H equals 3,269 times 9 divided by 5 plus 32 equals 5,898° F.

C equals 2,468 times 9 divided by 6 plus 32 equals 4,466° F. and C₈ H₁₈ equals gasoline equals 6,466° F. equals explosion temperature.

Constants used in these calculations.

Temperature of compressed volume equals 840° F.

Fall in temperature from the moment of explosion until piston descends on power stroke equals 5,466 divided by 3 times 2 equals 3,644° F.

Fall in temperature during power stroke equals 722° F.

Fall in temperature during the compression stroke equals 260° F.

Mean effective temperature equals M.E.T. equals 1,100° F. and 1,100 times 0.002 equals increase in pressure due to heat and M.E.P. equals M.E.T. times 0.002 times CP minus CP plus 14.7, and CP equals absolute compression pressure.

Example:

CP equals 80 times (1,100 times 0.002) equals 176.0 minus (CP plus 14.7) equals 81 equals M.E.P.

in accordance with heat and compression factors, but not including the most radical change that takes place, owing to the proportion that the diameter bears to the stroke. When the diameter is less than the stroke the formula is 176 minus (S minus D times 15) and 13,760 divided by 176 minus (S minus D times 16) equals M.E.P.

When the diameter is greater than the stroke, from a point at

which both the bore and stroke are taken as 3 inches and upward, the formula is: equals 13,760 divided by (176 plus (D minus 8 times 12)); the 175 minus or plus (S minus D times 6) or (D minus S times 2) equals volume per horsepower hour in cubic feet. But for motors in which the dimensions are less than 3D and 2S, the formula changes, owing to the small volumetric charge, as the efficiency is greatly affected by the overcharge of air and as the liquid fuel feed is so small that it can hardly be further controlled. As one volume of the liquid equals 1,740 volumes of the charge, the slightest change in the charge would mean 5 to 50 per cent. decrease in the M.E.P., and in these motors the formula would be: equals 6,466 minus (6,466 divided by 3) minus 612.00 equals M.E.T. and M.E.T. times 0.002 equals constant 2.42. However, small motors vary greatly, the same motor with the same fuel giving different results at different tests, the variation being from 5 to 50 per cent. The most effective motor I ever took a card from had a 6-inch bore by 4.1-2-inch stroke, and showed an M.E.P. of 87 pounds to the square inch.

In my opinion the two-cycle motor is the thing to use, and all these figures refer to it, as I do not consider the four-cycle a scientific production. Nevertheless, you cannot convince the manufacturer; he wants to show a lot of brass and iron for his money.

The following calculation illustrates a method of obtaining the correct volume of vapor from one volume of gasoline.

First calculation:

Gasoline equals C₈H₁₈ at 0.67 specific gravity.

Water at 62° F. equals 62.321 pounds per cubic foot and 62.321 times 0.67 equals 41.755 pounds per cubic foot for gasoline.

Hydrogen equals 0.089523 grams per litre.

Carbon equals 1.07191 grams per litre.

H equals 0.0055912 pounds per cubic foot.

C equals 0.0669442 pounds per cubic foot.

C times 6 plus H times 14 divided by 20 equals 0.0239,971 pounds per cubic foot for gasoline vapor equals 0.024 pounds app. per cubic foot equals C₈H₁₈ equals 0.024 pounds per cubic foot.

41.755 pounds divided by 0.024 equals 1,740 cubic feet of gasoline vapor from one cubic foot of gasoline, which equals 1,740 volumes of gas from one volume of gasoline and one pound divided by 0.024 equals 41,666 or 41.2-3 cubic feet of gas from one pound of gasoline.

Gasoline vapor requires for complete combustion from seven to nine volumes of air. Then 7 plus 9 divided by 2 equals 8 equals one volume of gas to 8 of air.

41.2-3 volumes gas times 8 equals 333.36 cubic feet of air equals total available volume per pound of the gasoline, and volume per horsepower hour equals V.P.H.P.H. and 333.36 divided by V.P.H. P.H. in cubic feet equals pounds of gasoline per horsepower hour consumed.

Calculations to ascertain the B. T. U.:

Formula equals 8,080C plus 34,462 H per Kg in degrees Centigrade.

C equals 6,610 and H equals 28,190 per pound in degrees Fahrenheit.

6,610 times 6 plus 28,190 times 14 divided by 20 equals 21,716 B.T.U. app. per pound of gasoline.

Value of gasoline as a fuel for explosion motors; gasoline at 20 cents per gallon; 7.48 gallons per cubic foot.

7.48 times 20 equals \$1.496 per cubic foot.

\$1.496 divided by 41.755 equals \$0.0358 or 3.58 cents per pound and 0.0358 divided by 333.36 equals \$0.0001076 per cubic foot or 10.75 cents per 1,000 cubic feet of gas, and if 173.7 cubic feet equals one horsepower hour, the cost per horsepower equals 173.7 times 0.0001076 equals \$0.01867 equals 1 cent 8 2-3 mills per horsepower hour.

Gasoline as compared with coal gas:

One pound gasoline vapor equals \$0.03583 equals 41.2-3 cubic feet of gas, then

0.03583 divided by 41.666 equals \$0.00086 per cubic feet of gas, or \$0.86 per 1,000 cubic feet of gas, and it is 25 per cent. less than coal gas, or as 8 is to 6. Then as

Coal gas equals 6 of air equals 6,000 and

Gasoline vapor equals 8 of air equals 8,000 and 2,000 plus air equals 25 per cent. or 0.0001076 times 6,000 equals 64.5 and 0.0001076 times 8,000 equals \$0.86 at \$1 per 1,000 for gas, and \$1 divided by 8 equals \$0.126 and \$1 divided by 6 equals 0.1667 and \$0.1667 minus 25 per cent. equals 0.126 or

Gasoline vapor and air, volume equals 8,000 cost \$0.86.

Coal, gas and air, volume equals 6,000 cost \$0.86.

Gasoline vapor and air volume of 6,000 cost \$0.645.

Gasoline as an economical fuel for test run.

48 divided by hours of run equals power consumed during run for a 26-pound limit, as

Run equals 4 hours and 48 divided by 4 equals 12 horsepower consumed in 4 hours from 25 pounds of gasoline.

48 equals (333.36 times 25 divided by 173.7 or x volume).

x volume equals volume per horsepower hour.

I consider this a just rating for gasoline. R. C. MATLACK, Chicago, Ill.

A THREE-TON TRUCK FROM KANSAS CITY

AFTER a wide experience in all classes of pleasure vehicles, the concentration policy of the Kansas City Motor Car Company, of Kansas City, Mo., has led to the production of a three-ton truck only, a vehicle which benefits from the earlier diversified work of the firm and profits by its present equipment and well-selected international staff. The vehicle has been designed with a full knowl-



AS SEEN WHEN APPROACHING.

edge of the conditions under which the mechanical truck has to work, with the result that simplicity, accessibility and robustness form distinguishing features.

Carried forward on a Bethlehem chrome nickel steel frame, where it is in the most accessible position possible, is the power plant of the truck. The channel section frame is 168 inches long, 7 inches deep, 48 inches wide, narrowed to 36 inches at front to permit

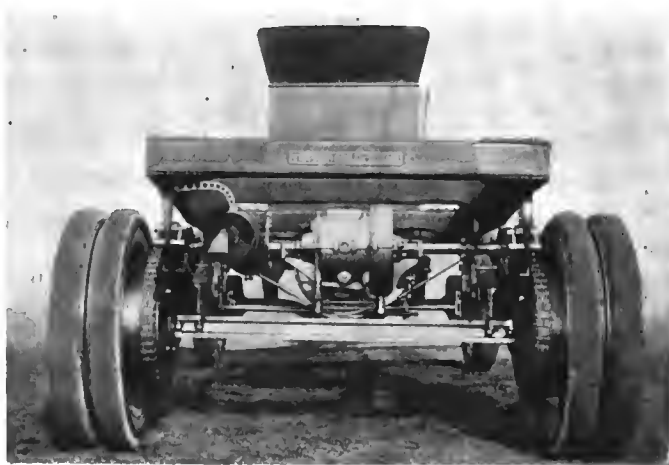
of big steering angle; it is reinforced by five cross members and large gusset plates riveted in pairs. Realizing the importance of a good suspension in the life of tires and engine, special steel springs, ten leaves 40 by 2 1-2 in front and 13 leaves 48 by 2 1-2 in the rear, are provided. The rear springs are double-shackled with extremely stiff distance rods, pivoted on sprocket shaft supports. The front axle is one-piece hammered-forged Krupp special steel, I-beam section, with Elliott-type steering yokes, with one H. B. ball thrust bearing, spring seats being integral. Steering knuckles are very heavy, hammer-forged with two large H. B. ball bearings on spindles. The rear axle also is one-piece hammer-forged Krupp steel, with integral spring seats, and H. B. ball bearings on each sprocket. The position of the motor forward leaves nearly the whole body of the truck avail-

able for the load, actual dimensions being 4 behind the driver's seat. Actual weight of the truck

is four thousand pounds, and full load capacity three tons. Wheel-base is one hundred and fourteen inches, track sixty-four inches and maximum speed is ten miles an hour.

A look through the big inspection plates in the frame forming driver's seat reveals a four-cylinder, four-cycle vertical motor with cylinders cast in pairs, mounted directly on the side frame. Valves are on opposite sides, each camshaft being machined out of the solid with cams integral; compression reliefs are provided for ease in starting. Very large water jackets, with 1 1-4 inch water connections, surround the cylinders; water circulation is assured by a large gear-driven centrifugal pump through a stiff tubular radiator equipped with a belt-driven aluminum fan.

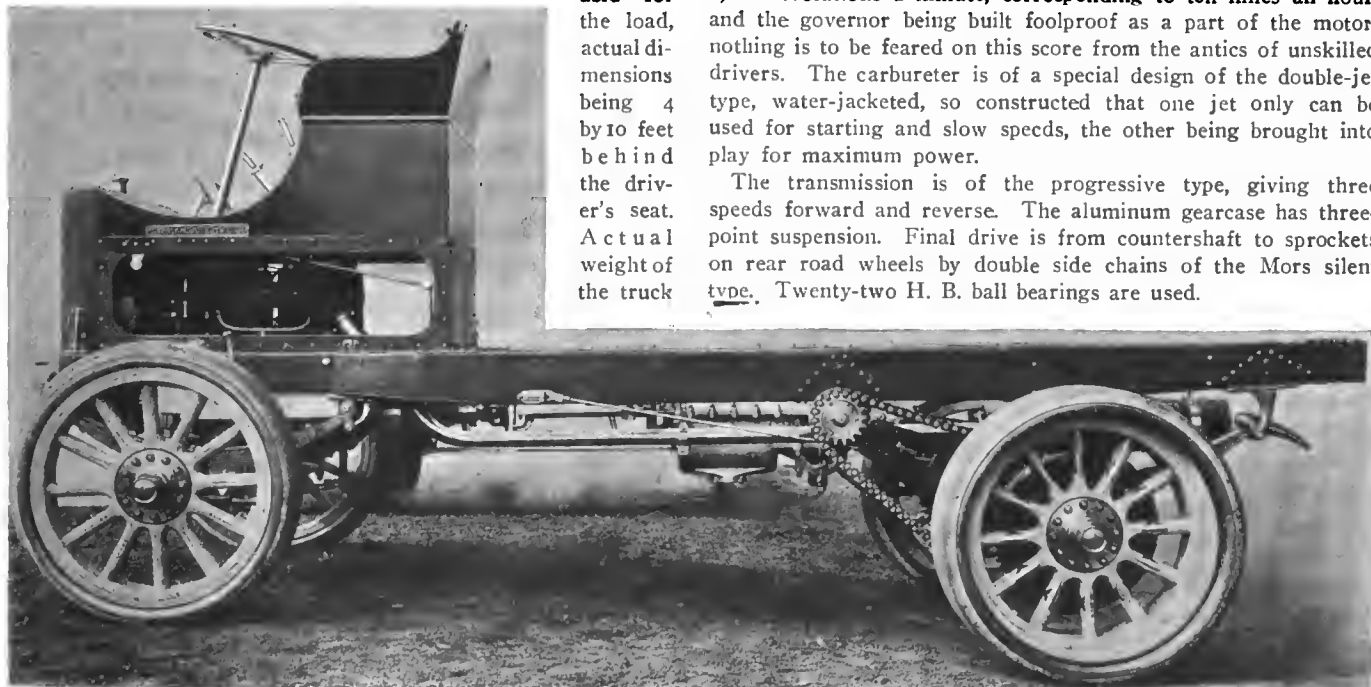
Double ignition is provided by a high-tension magneto and battery and coil. There is fixed sparking point, spark being only retarded automatically when cranking the motor. Control is entirely by throttle lever on top of steering wheel, and by acceler-



REAR VIEW SHOWING DRIVE AND KINDRED MECHANISM.

ator pedal for quick-speed regulation in heavy traffic. The speed of the motor being automatically regulated by the governor to 1,000 revolutions a minute, corresponding to ten miles an hour, and the governor being built foolproof as a part of the motor, nothing is to be feared on this score from the antics of unskilled drivers. The carbureter is of a special design of the double-jet type, water-jacketed, so constructed that one jet only can be used for starting and slow speeds, the other being brought into play for maximum power.

The transmission is of the progressive type, giving three speeds forward and reverse. The aluminum gearcase has three-point suspension. Final drive is from countershaft to sprockets on rear road wheels by double side chains of the Mors silent type. Twenty-two H. B. ball bearings are used.

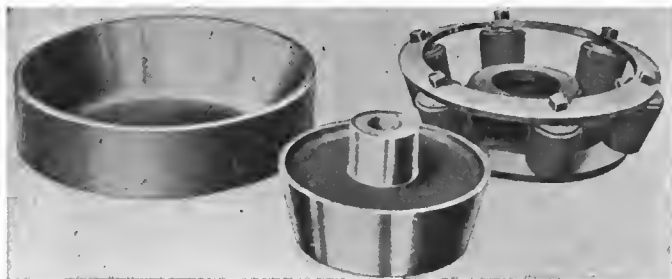


SIDE ELEVATION OF THE KANSAS CITY THREE-TON TRUCK, SHOWING LOCATION OF MOTOR.

THE GEARLESS TRANSMISSION.

In perfecting the gearless transmission, the constructional details of which are illustrated and described herewith, it would appear that a long step toward the realization of the goal of many a designer—the gearless car—had been taken. Both the shortcomings of the present system in which, with few exceptions, gears are slid into mesh while in motion, as well as the reasons which have worked for its retention, are matters of too common knowledge to need recalling. "Simpler than a planetary, stronger than spur gears, more lasting than either," is a brief condensation of the maker's claims for the gearless transmission which consists of but three parts in all. These are a cup, a cone and a cage holding six rolls, the simplicity of these parts being evident at a glance from the illustrations. All are contained in a single housing, a view of which is shown. This comprises two-thirds of the entire change-speed gear, or rather device, as its chief feature is its lack of gears, in that with its aid, the low and reverse speeds are obtainable. The direct drive is obtained by means of a special clutch encased in a second housing, shown facing the first in the illustration referred to.

From the foregoing it will be noted that the gearless transmission bears considerable resemblance to the well-known planetary type, the similarity being very great so far as outward appearance is concerned, this being evident from the plan view of the chassis showing the complete gear in place, while the method of operation is actually the same. The remaining essen-



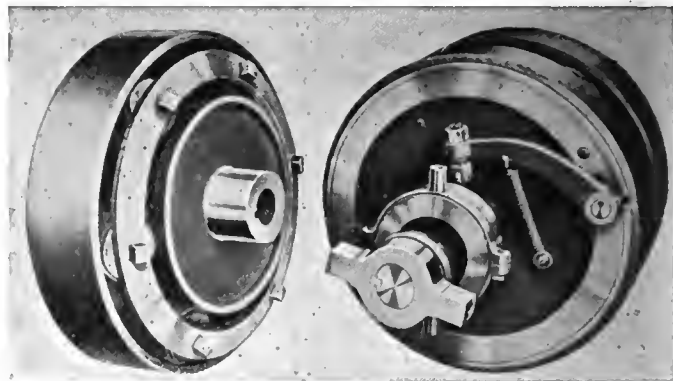
SIMPLE ESSENTIALS OF THE GEARLESS TRANSMISSION.

tial of this change-speed device consists of a crab-clutch splined upon the driving shaft and sliding thereon by means of a hand lever. As the forward end of the driven shaft is journaled in the hub of the driving cone, and the latter is permanently attached to the driving shaft, carrying the internal portion of the high-speed clutch, the external portion of the same is rotatable thereon, as is also the cup of the transmission. Thus the high-speed clutch is only connected with the driven shaft of the car when the crab-clutch is shifted so as to engage it, connecting it with the driving shaft from the motor.

The details of the working of the device can most readily be understood from a description of its operation rather than of its parts and their relations. To obtain the first or low-speed forward, the crab-clutch mentioned is shifted forward engaging the cage of rolls forming part of the external portion of the high-speed clutch, thereby connecting it with the driven shaft of the car. The cone keyed permanently to the motor shaft revolves the cage of rolls permanently fixed to the external member of the high-speed clutch by means of studs, in the same direction that it revolves, and as the cup of the transmission is held stationary by one of the brake bands operated by a foot pedal, it will be evident that the cage of rolls must roll around the interior face of the cup. This transmits the power to the driven shaft through the crab-clutch, which is splined on it. For the direct-drive or high-speed, pressing another pedal forces the cone forward, causing its tapering face to engage the roller on the end of the lever, raising the lever and opening the ring of the clutch against the inner side of the periphery of the housing.

From the foregoing, it will be apparent that the crab-clutch mentioned is always in engagement with the cage of rolls for the forward speeds. In order to obtain the reverse speed, the side

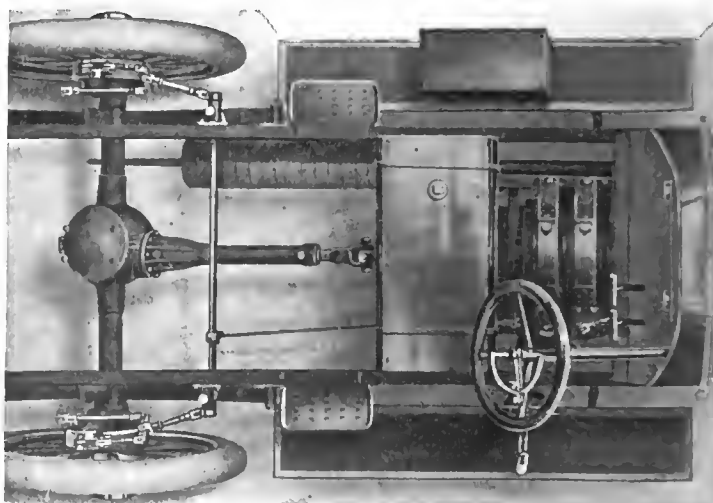
lever is called into play to slide this crab-clutch rearward, thus disengaging the external portion of the high-speed clutch from the driven shaft of the car and connecting therewith the external cup of the transmission. As the cone is permanently keyed to the motor shaft, it revolves continuously and thus turns the rolls,



THE TWO CLUTCHES READY TO MOUNT ON CAR.

thereby transmitting power from the cone to the cup through the medium of the rolls, which cause the cup and driving shaft to revolve in the opposite direction, thus giving the car a reverse motion.

The transmission is held in proper adjustment by means of a pressure bar located back of the cup, as shown in the plan view of the chassis, the required tension being maintained by springs exactly as employed in the familiar cone type of clutch. The cup is always in contact with the rolls at the required pressure. To start the car, it is only necessary to depress the pedal corresponding to the low-speed brake band, which compresses it around the cup of the transmission and gets the car under way. As soon as it is moving, this pedal is released and the other depressed, shifting the trunnion cone which operates the high-speed clutch. To shift from high to low-speed is even simpler, as it is merely necessary to depress the first pedal, again tightening the first brake band and automatically withdrawing the trunnion cone from engagement. The emergency brake is also interconnected with this cone and releases it when put on. There is a third pedal, which, when the car is running on either of the forward speeds, acts as a powerful transmission brake, as it compresses the band surrounding the high-speed clutch. The



PLAN VIEW OF CHASSIS SHOWING TRANSMISSION INSTALLED.

drum upon which it acts is 18 1-4 inches in diameter by 2 1-2 inches face, so that it provides a very powerful retarding agent. The gear ratio is 9 to 1 on the low-speed and 3 to 1 on the high-speed, this driving being alterable by changing the size of the pinions. The Gearless Transmission Company, Rochester, N. Y., are the makers.



It seems fitting that the builders of the Darracq cars whose experience has led them throughout the entire range of automobile construction from the single-cylinder car up to the eight and back again, as they are at present devoting attention to a one-lunger, should also specialize on a "six." This is a 50-horsepower shaft-driven car that attracted considerable attention when first uncovered at the Paris Salon last December, and is characterized throughout by features of design and methods of construction that have carried cars of this make to victory in more fields than one. The pressed steel frame forming the foundation of the chassis is of the type long characteristic of this car, all its members being of a deep-flattened "U" section in the model under consideration. There are four cross-stays, all of which are webbed at the corners to reinforce them. A sub-frame construction is employed and is carried on the first, second and third cross members. The side members of the main frame taper each way from the center, where they are six inches wide; they are turned in three inches at the dash in order to give an increased steering radius, and at the forward end of the rear springs they are given a four-inch camber in addition to being narrowed, this construction providing for additional spring play. The first cross member, which also acts as a radiator support, is carried low, so that the bottom of the radiator sets below the level of the main frame; it is placed just to the rear of the front axle. At the other end long S-shaped drop-forged dumb irons are employed to extend the spring length, besides carrying the body on lugs. The groundwork of the chassis is completed by the drip pan, extending from the radiator to the rear of the gear-box.

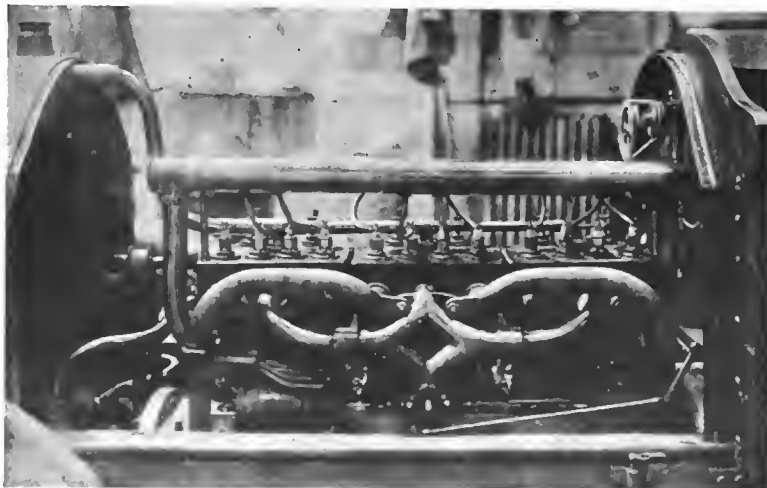
Motor Design.— The cylinders are cast in pairs and bolted to a comparatively shallow aluminum crankcase, provided with a large handhole opening on the right side. The base is divided into two parts, and a departure has been made in the method of fastening it to the sub-

frame by providing a continuous flange in place of the customary arms or lugs, thus making a much more solid form of construction with practically the same amount of metal. The cylinders measure 112 mm. bore by 120 mm. stroke, all the operating mechanism being placed on the left-hand side of the motor. All the valves are mechanically operated and interchangeable, and the single camshaft is utilized for driving the magneto and the gear pump, as well as operating the valves, while at the end it carries a bevel gear, driving a short vertical shaft carrying a Nieuport auxiliary timer on the dash, as well as the LeFevre mechanical oiler, by means of a Powco wire belt, the complete oiler being placed on the dash. The right-hand side of the motor is totally unencumbered except for the water-intake pipe and three oil feeds, thus permitting a free hand in working at the internal parts of the motor through the openings in this side of the base.

In an engine of the length necessary for six cylinders, it is quite a problem to so dispose the piping as to make it most convenient with the least length. In the case of the exhaust this has been accomplished by the use of two separate exhaust manifolds, each of which takes care of the exhaust from three cylinders, and is piped independently to the muffler, thus providing ample expansion space and rapid cooling. A short branch, made fast to the rear exhaust pipe, is led around the carbureter to provide a supply of hot air for the latter.

One of the most striking features of the motor design is to be found in the webbed construction crankshaft. As will be seen in the illustration showing this essential of the motor, the regulation type cranks or throws have been replaced by solid disks, each of which acts in the capacity of a small flywheel, thus tending to improve the balance of the motor. These disks are 15-16-inch thick and 7, 1-16 inches in diameter; there are nine of them in all.

The crankshaft is sup-



CARBURETER SIDE DARRACQ "SIX" SHOWING INTAKE MANIFOLD.

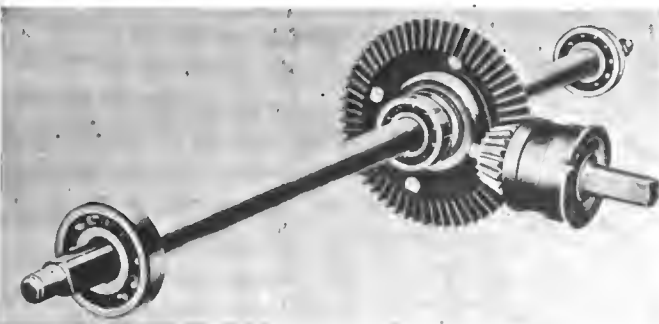


THE PECULIAR ONE-PIECE DISK-CRANKSHAFT.

ported on two four-inch babbitted bearings at the ends and two three-inch bearings at the center, the latter being placed between the second and third, and fourth and fifth cylinders. The flanged connecting rods are provided with cups to scoop up the oil from the shallow crankcase, while runways are fitted to carry oil to the crankshaft bearings. The camshaft is in one piece with the cams integral, the cylinders firing in the order of 1-4-2-6-3-5. The flywheel is 15 inches in diameter and has a 5-inch face. Cooling is taken care of by a gilled tube radiator and gear-driven pump, supplemented by a fan.

Carburetion.—Quite in contrast with some of the cars that have been on the market as long as the Darracq, the carburetor is of the simplest type, consisting of a float-feed chamber and single nozzle with an auxiliary air inlet controlled by a helical spring. It is always adjusted at the factory to give the best results, and the success that has attended its use on the many cars of this make turned out shows that its factor of reliability is very high, and quite in keeping with its simplicity. The problem of designing an intake from the carburetor to the cylinders that would represent an approximately equal length of tube from the central point to each has been solved in an ingenious manner, as will be plain from the illustration picturing the valve side of the motor. Brass tubing of 1 3/4-inch diameter is used and is of uniform size throughout. The carburetor is centrally placed between the third and fourth cylinders, and the intake attachment to it is in the shape of the customary Y, which turns upon itself after rising a few inches, and is converted into an inverted Y, forming a diamond as shown. The upper Y communicates with the third and fourth cylinders, while the two branches which leave it on either side carry the fuel to the first and second on one hand, and the fifth and six cylinders on the other. With a six-cylinder engine, as the impulses overlap one another, the suction stroke of one-cylinder is not quite completed before that of another begins, which results in exerting a uniform suction on the nozzle.

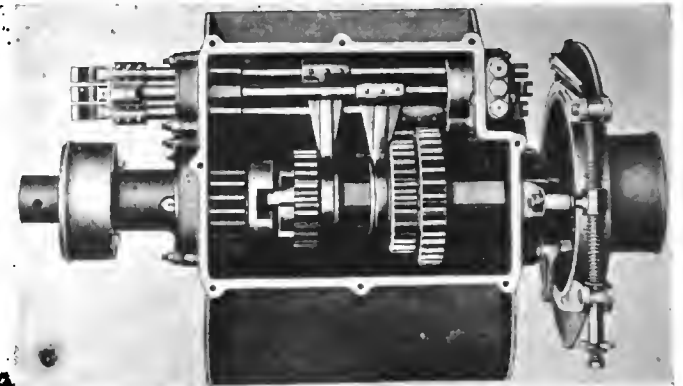
Ignition Details.—In accordance with current practice on high-grade cars where this essential of the motor is concerned, two independent systems of ignition are employed, both of them being of the high-tension type. One consists of a self-contained unit—a Simms-Bosch high-tension magneto, while the other is a synchronized system employing accumulators as the source of current supply. Though each system is complete in itself the wiring has been simplified and the amount of apparatus reduced to a minimum. The accumulator system consists of a single Nieupert coil mounted on the dash, which also supports the combined timer and distributor driven by bevel gearing from the camshaft. The contact breaker cam is hexagonal and is mounted on the same shaft as the distributor, which has been made as simple as possible. The six terminals representing the plugs



THE REAR AXLE UNIT SHOWING GEARS AND BEARINGS.

from the cylinders are housed in a recessed vulcanite chamber, while a revolving disk of the same material carries the moving connection of the other side of the circuit. As there is very little necessity for advancing or retarding the spark when using the magneto system—and this, of course, is the constant-service system, the battery merely constituting a reserve—no ignition lever is fitted on the steering wheel. Instead, a small lever is carried forward from the magneto, ending in a ring near the starting crank in order to retard the time of firing to start; once under way, the lever is pushed back, and the car is run without altering the time of ignition. A ratchet lever and sector is placed on the dash for advancing and retarding the spark when the battery system is used.

Transmission.—The first step in this essential consists of the conventional type of leather-faced cone clutch, which, however, is not wanting in original features. It is entirely self-contained, both the flywheel and the aluminum cone being carried on the crankshaft of the motor, the retaining spring being housed between the two. To prevent the clutch from taking hold with a jerk in starting, four strips of clock spring-steel press against



CHANGE SPEED GEAR BOX SHOWING PEDAL BRAKE AND SPRAG.

the flywheel rim, and take the pull of the clutch until the latter is firmly engaged, permitting an easy start, even on the high gear. These strips are pressed outward by four small helical springs.

The changespeed gear box provides four speeds forward with the usual *marche arriere*, and is operated on the selective system, the hand lever being provided with a trigger which must be pressed in order to set the lever in the reverse position, the slot corresponding to the latter being fitted with a gate. The countershaft of the changespeed gear is placed beneath the main shaft, instead of parallel, and is idle on the direct drive.

General Details.—Two sets of brakes are fitted and the practice of making the running brake act on some part of the transmission system has been adhered to. This brake is pedal-operated, and consists of a drum placed on the propeller shaft just behind the gear box; it consists of a drum and metal band. Just behind it, on the same shaft, is a ratchet sprag operated by a small lever from the dash. The emergency brake is of the internal expanding type and is located on the driving wheels.

The steering gear is of the worm and segment type, supported on ball bearings, and the steering pillar is given just sufficient rake to place it in the most convenient position for the driver: the steering knuckle is a three-piece drop forging. Semi-elliptic springs are employed for the suspension, the forward pair directly under the frame measuring 37 inches in length, and have eight 1 3/4-inch leaves, while the rear pair is shackled outside the frame, and measure 45 1/2 inches, having nine leaves of the same width. The wheels measure 980 mm. by 120 mm.; they run on two-point ball bearings and are shod with the Michelin racing type of tires having a ridged tread. The gasoline tank, holding 17 gallons, is located under the front seat, and is of seamless brass, bolted directly to the frame. The wheelbase is 132 inches, tread 53 inches, and the clearance 11 1/2 inches. The gear box fitted gives the car speeds of 9, 17, 38 and 60 miles an hour.

Continuing An AUTOMOBILE in OLD PROVENCE Around The ETANG de BERRE



"I HAD rather discover a new road across France than blaze a trail across 'Darkest Africa,'" said the chauffeur; and he was quite right. There's a wealth of novel experience to be had, besides no end of out-of-the-way information to be gathered, if one will only leave the beaten track and strike out for himself anew, not necessarily into a wild unpeopled region, but at any rate off the track of conventional travel. The byroads are not so "fast," as the automobilist puts it, as the high roads, but, like Prince Charlie, one often arrives before the others who stick to the well-worn roads. The shortest distance between two given points is often not by the "Routes Nationales," but by the *routes secondaires*, and even those of the third class, all of which are more than ordinarily good in France when judged by any other standard of road values.

There is a little outlying section of Provence, just off the great highway which runs from Paris to Antibes and known as the Route d'Italie, which Riviera tourists by road or rail know little of. Nîmes, Arles, and Avignon they know, and at times linger in beyond the hour and a half usually devoted to déjeuner, but the vast wind-swept tracts of the Crau and the Camargue, with their olive groves and cypresses and their flocks and herds and their little, sleepy, old-world towns, are a terra incognita to many who would revel in their delights if they only knew.

This, then, is a plea for that part of Provence known as the Bouches du Rhône. It has been shamefully neglected by winter birds of passage to the Riviera and the stale divertissements of Monte Carlo and the bridge parties and the tea-fights of Nice and Cannes.

Between Arles and Marseilles, then—after one has made that delightful excursion to the Gallic Pompeii, Les Baux—is a region full of quaint charm and novelty which the "personally conducted" know nothing of, and which must truly be seen to be appreciated.

Off at a tangent, southeast forty kilometers or a little more, from Arles, is Les Saintes Maries, the landing place in Gaul of the three Marys of Judea, who were "exiled in an open boat without sails or cordage," as the legend has it. The great fortress-

church of the little fishing village of "Les Saintes" is one of the wonder works of architectural art. Within is the shrine containing the relic of the Marys of Judea, and beneath in the crypt is the burial place of the gypsy Sara, their servant, and the *patronne reine* of all the gypsies and vagabonds in Christendom. Here, on the twenty-fourth of May of each year the nomads and *romany chiefs* from all parts of Europe gather to pay their devotions at the shrine of their sainted Sara.

At any time of the year it is a pilgrimage not to be neglected by any who pass by Arles. Go down and back between breakfast and lunch, or between lunch and dinner, or lunch at the Hotel de la Poste at "Les Saintes," if you will; but, anyway, you will have to pick up your wheel-tracks again back as far as Arles, as there is no other way of crossing the Rhône, and taking up your route again towards Marseilles.

Taking the road again from Arles, the route is due east for Salon, forty kilometers straight away over the stony Crau, with a road absolutely level for most of the distance.

Highways Which Are Not of Yesterday.

Here's a good place to consider how and why these first roadways across southern Gaul were made: The Phoceans made the first great thoroughfares in Provence, the *via Héraclea* being the oldest of all which can be traced with certitude. It began in the south of Spain, and freeing the Pyrenees reached the Rhône, near Arles, where it branched out into three arms, one going north by Avignon, another easterly or northeasterly via St. Rémy, Cavaillon and Apt to the Alps, and the other striking across the Crau to the south of the Alpilles, the latter, probably, being the precursor of this very Arles-Salon road, continuing on to the Italian frontier over Les Maures and the Estérel.

The last portion alone—the southern route—is that actually traced by Hercules, but the nomenclature is generally given to the entire trunk-way. None of the villes formerly existing on this *via Héraclea* exist to-day, none dating in fact as settlements of magnitude, before the Roman era.

The Massaliotes reviewed and resurveyed this route and put up the progenitors of the modern mile-stones every eight *stades*, one of which may still be viewed in the Hotel de Ville at Salon.

For forty kilometers one crosses this strange nondescript land, the Crau, peopled only by an occasional lonely Mas or farmhouse and immense herds of sheep, goats and long-horned cattle and their guardians, a sort of a cross between a cowboy of the far West and a Swiss shepherd.

Mostly this vast, vague land, and its neighbor, the Camargue, the other side of the Rhône, is nothing but a grazing-ground, however. The cattle are chiefly a race of Spanish-crossed bovines, the bulls of which are frequently driven wild into town and put through their paces in the old arenas of Arles and Nîmes, or even in an improvised Plaza in the smaller towns, such as St. Rémy or Salon. It is commonly thought that bull-fighting is not a French institution, but be that as it may, there is no question but that it is as much the Provençal's pleasure as it is the Spaniards'.

Salon, the center of the olive and olive-oil trade of France, is an ancient bourg and a modern one; it has a fine old city gate, an ideal old battlemented château, and other relics of days gone by, and it also has cafés that would do justice to Paris, two or more exceedingly up-to-date hotels, and a typewriter agency (American, of course). The Grand Hotel at Salon is an efficient establishment which has a "good-enough" garage, and which caters for the inner man bountifully and excellently, if in somewhat a reminiscent fashion of a *grande ville*.

From Salon to the shores of the Etang de Berre, a great landlocked inland sea, is not more than a dozen kilometers, and one should first make for St. Chamas, there to visit the Pont Flavian, one of the world's bridge-building wonders. The road can easily be missed coming out from Salon, and if you are not careful you will bring up in the ugly, disgusting, little railway junction of Miramas, instead of St. Chamas, which you will not want to do at all if you have the true automobile spirit.

We went first to St. Chamas avowedly for the purpose of seeing the Pont Flavian, which our remnants of memorized history told us existed. We wanted to see it because we wanted to drive our automobile over a Roman bridge, whose foundations were first laid in the reign of the conquering Augustus. One meets with a genuine surprise when he first comes upon the Pont Flavian. It spans the rocky bed of the Touloubre and remains to-day one of the finest of those Roman monuments which were scattered up and down Gaul in the days of the Western Empire.

Skirting the western shore of the Etang de Berre, one arrives, in another dozen or fifteen kilometers, at Istres, a veritable Italian hill-town in France, as quaint and picturesque as anything to be seen in Piedmont. To eat and sleep, one must keep on as far again, when he will find the Père Chabas at Martigues' Grand Hotel ready and waiting for him.

Something of Interest to the Epicure.

One comes to Martigues' for two things, because it is known to the French as the Provençal Venice, and because of Chabas and his *bouillabaise*, the famous plat of Provence, but cooked nowhere with the quintessence of delicacy and aroma as by le Père Chabas, as he is affectionately designated.

As we drew up before Chabas' ever-open welcoming door, a perfume and an incense floated out which brought again to mind

dress of Arles—and runs the finances. As she puts it herself: "Paul he makes the bouillabaise and I keep the purse-strings. otherwise we should be as poor as a Martigaux." (Chabas comes from Cavaillon—the home of all good cooks, and Madame—being an Arlésienne—can afford to talk this way.) From this you may judge what a "good sort" Chabas really is. He knows how to cook baked beans, too, and makes a wonderful concoction which he calls an "*omelette Américaine*," which is nothing at all American, but the most glorious *omelette au rhum* you ever ate, or are ever likely to eat.

Where Modern Industrialism Jostles Antiquity.

Four kilometers from Martigues, at the outer end of the Canal de Caronte, and at the very edge of the surging, shimmering Mediterranean waves, is Port de Bouc, with a great shipbuilding works and a population which is as Italian as it is French, and in some respects more picturesque.

St. Mitre is six or eight kilometers to the westward, and is an old Saracen hill-town, once a stronghold of renown, as its old ruined walls and gates still show. Fos-sur-Mer, hardly known except to antiquarians, is between St. Mitre and the sea, and is the ancient Roman Civitas Marius, a poor, wind-worn relic to-day of a power long since dead and buried. The old walls, or such as remain, are as lively a representation as one may find of a



THE ROADS OF THE BOUCHES DU RHONE.

the days when three American artist folk put in one long, bright winter here and ate *bouillabaise* once a day for a hundred days on end, and didn't get tired of it either. We also ate langouste—as much of an improvement over the lobster as the lobster is an improvement over a crab—and oysters, and even mussels—which no one in America ever thinks of eating, though here we thought them an excellent dish.

There may be many good and sufficient reasons why all automobile tourists cannot find the time to explore all the highways and byways of Provence that he would like, but there is absolutely no excuse for giving Martigues and Chabas, and his *bouillabaise* the go-by. To do so would be doing one's self an injustice, since the route via Martigues, from Arles to Marseilles, is as good a road, and but a trifle, if any, longer than that which is known as "la grande route."

Martigues is known of all Provençaux, by some Frenchmen, and by a few—a very few—outsiders, mostly artists and Americans at that; seldom if ever an Englishman. There are no tea-shops! Martigues is Venice without the palaces and history; its quais and canals are every whit as picturesque as the Guidecca, and nowhere along Mediterranean shores are to be seen so wonderful a collection of those queer lateen-rigged, *tartanes*, *balancelles*, *bêtes* and *catalans* as here. And then there is Chabas again with his cookery which can't be beat by anyone, and equaled by but few. Nothing in the Palace Hotels of Cannes, Nice or Monte Carlo can offer the zest of the cuisine *chez Chabas*, and for that reason the memory of these eulogistic lines should not be put away in a foggy corner of the mind. It's all very crude and rough and ready; all but the welcome of Chabas and his Arlésienne wife, who wears always the picturesque head-

mediæval walled town, the general outlines being reminiscent of Carcassonne in the Pyrenees, the finest walled relic of its class to be met throughout the length and breadth of France.

Leaving Martigues behind, and heading east towards Marseilles via Carry, Saussay and Estaque, another new world is opened up for the automobilist who has just come down from the sterner north. There are forty-eight kilometers of superb up and down and twisting, turning road from Martigues to Marseilles by this route, mostly by the very fringe of the great, tideless Mediterranean. The background panorama rising off to the eastward of Marseilles is as brilliant and fairylike as anything on the Riviera itself, besides which there is a touch of actuality lent by the smoke of many factory chimneys and the steamships in the harbor, with the prominent accented notes of Notre Dame de la Garde and the Chateau d'If ever in the foreground.

The other route from Martigues to Marseilles still skirts the shores of the Etang de Berre to Marignane, where one should stop long enough to visit the Hotel de Ville, the ancient family chateau of the Mirabeaux. A half a dozen kilometers farther on is Les Pennes, a curiously perched and ravishingly quaint hillside town, with a population of less than a thousand, all living along one main street, and having no occupation in life but to remark on the weather and dance the Farandole and drink their aperitives twice a day on the café terrace of the tree-bordered place, where all through the winter the "*cheminée du Roi et de la Rene*"—the brilliant southern sun—gives all the heat necessary for comfort. Where the money comes from to keep all this population alive is a question—probably from pensions.

Just beyond Les Pennes is the Côte d'Assassins, an ominously-named three kilometers of bad road surface, and as steep a climb

as one will find on any main road in France. The hill climbs up to the crest of the Estaque range and drops down with a much gentler slope on the other to Marseilles without more ado. Its nomenclature is ascribed to two causes; that murderous highwaymen preyed their pestiferous calling here in days past with great regularity—and do to-day less frequently; and that to-day, as ever in the past, a wagon or an automobile gets out of hand and dashes down one side or another of the murderous hill to the death of the occupants, or any who may be in the path. Both explanations are plausible. It's a dangerous hill, either up or down, and the traffic over it is enormous in quantity.

Something About Bustling Marseilles.

The coast down the Mediterranean side to St. Antoine, the first tramway suburb of Marseilles, and so on for another ten kilometers to Marseilles' famous Cannebière, is a continual heart-in-the-throat procedure. One must travel slowly or take the consequences, which are as likely to be as direful for the occupants of the automobile as for outsiders. If you are Riviera bound, branch off the main road just before the Côte d'Assassins and go east via Aix, leaving your machine *en garage* at Aix, and go into Marseilles by electric car

force you must stop and convince the officials that you are not smuggling in a juggled hare or a can of French peas, and thereby defrauding the municipal coffers of some sous.

Marseilles' hotels are of all sorts. The great hotels, like the Louvre et de la Paix or the Grand Hotel Noailles, are big, expensive establishments, excellently appointed and excellently well-kept, but the same sort of thing you will find in Paris with prices about the same. The Hotel de Russie et d'Angleterre is more modest in fit-up and price, and has garage accommodation for three automobiles.

The best thing in the hotel line at Marseilles, for the automobilist or other traveler, is the Hotel du Touring, on the Cours Belzunce, with "*chambres hygiéniques*," and, what's more, hot and cold water in every room and electric light, a combination that is rare in France, or indeed in Europe. It supplies rooms only, and there are no accommodations for automobiles. Its prices are very moderate, and the inconvenience of going outside for your food is one of the pleasures of coming to Marseilles anyway; its restaurants are apparently more numerous, excellent, varied and modest in price than in any other city on the globe.

For garage accommodation one should go to l'Archeveques or the DeDion Agency, Masse



MARTIGUES, THE PROVENCAL VENICE.



AT CHATEAU NEUF.



THE WALLED TOWN OF LES PENNES.

in an hour. You will save the need of a big insurance premium by so doing, also the possible chance of killing yourself.

The last ten kilometers after the crest of the Estaque is simply awful (as indeed are all the roads in and out of Marseilles). There are great, long, tandem-drawn trucks and drays without number, often with five horses in line. There are two lines of tramway all the way, and a bad lot of badly worn pavé as well; besides which there is the Bureau d'Octroi, placed in a most convenient spot, where per-

et Cie., each nearby. It will cost two francs a night for storing your automobile, but land values are dear in Marseilles, and if you want any repairs afterward, such as a new thread or a bolt, probably a franc will cover it. The garage proprietors of Marseilles are not robbers, simply good business men. The days of the overcharging garages are drawing to a close, and one finds more often than not places where the prices are fair and the work mainly satisfactory.

Marseilles, also, is big enough to offer a wide choice.

ROYALTY AT FIRST MADRID AUTO SHOW.

MADRID, May 4.—King Alfonso presided at the inauguration of the first Madrid automobile show to-day in the Palace of Industries and Fine Arts. His Majesty, who was accompanied by the Queen Dowager and other members of the royal family, was received by representatives of the municipality.

French firms take the lion's share of the exhibition space. Only the most important German firms have stands; Britain's representatives are but three in number and the Spanish industry is not able to claim a greater numerical value. Competitions will be held for the most artistically decorated stands and for the most elegant and comfortable bodies. During the two weeks that the show remains open garden parties, bull fights, banquets, balls and galas will be held daily.

GOLD CUP MANAGER LANDS IN EUROPE.

ANTWERP, April 25.—Among the passengers arriving on the Red Star liner "Vaderland" from New York to-day was Georges Dupuy, manager of the American Gold Cup tour. Mr. Dupuy has brought with him a 60-horsepower Stearns, on which he expects to start immediately for Paris. After a few days in the French capital engaging seats for the tourists who will visit the Grand Prix, securing hotel accommodation for the main party, etc., the Stearns will set out on its 6,000 miles run through Europe, covering the entire route to be traveled later by the caravan.

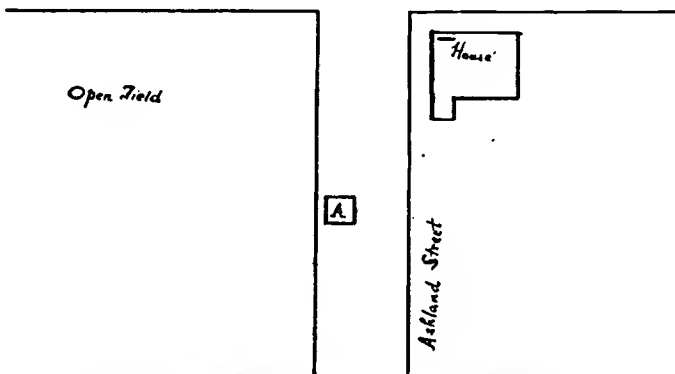
Emperor William and Prince Henry of Prussia, accompanied by several government officials and members of the I. A. C., toured recently over the Taunus course.

TO EXAMINE THE PROFESSIONAL CHAUFFEURS

BOSTON, May 6.—The Massachusetts Highway Commission created consternation in the ranks of the professional chauffeurs last week when it announced that it proposed putting into operation a system of written and road tests for applicants for licenses to operate motor vehicles for hire. The present requirements for obtaining a professional chauffeur's license are very light, the applicant having to swear merely that he has driven a hundred miles or more. But even under these conditions the commission found that many applicants, mostly the product of "Automobile Schools," were perjuring themselves in order to obtain licenses, and that they were really unfit to drive. The Governor also recognized this state of affairs, and in his inaugural address recommended that a board of examiners for chauffeurs be established. The Legislature turned down the Governor's proposition, but it is expected that it will be willing to provide the necessary funds, \$3,000, which the Highway Commission wants to carry out its examination system.

Some weeks ago the commission directed its secretary, A. B. Fletcher, to make an investigation into the professional chauffeur

To Malden — Salem Street — To Medford



STREET DIAGRAM USED FOR DRIVERS' EXAMINATION.

situation, and, as a result of that direction, Mr. Fletcher drafted a system of tests, and has been experimenting upon applicants for licenses. The test is in two parts, one a written examination which counts for 50 per cent., and the other a road test which counts also 50 per cent. It is figured that a candidate who can pass the road test and make at least 15 per cent. on the written test should have a license. The secretary has examined recently forty-one applicants, and eleven of these failed to meet the requirements.

The road test that has been used in the experimental examinations consists of driving up and down hill in clear and crowded streets and turning corners, besides a demonstration of the applicant's familiarity with the machine. The applicant was required to provide the machine with which the examination was made.

If the Legislature provides the appropriation asked for, the Commission will at once put its system of examination into effect. It will probably appoint examiners in most of the principal cities of the State to conduct the examinations, so that applicants will not be obliged to come to Boston. The examination applies only to applicants for professional driver's license, the commission not deeming it necessary to subject applicants for private operators' licenses to such a test. The written examination form used by the commission is as follows:

PART I.—(Written Examination.)—The applicant will answer each of the following questions without assistance from any person and without consulting any book, note or paper of any kind. The answers may be as brief and concise as is consistent with the subject.

1. When, in operating a motor vehicle, another vehicle approaches you, on which side of the center of the traveled way should you pass the approaching vehicle?
2. When you desire to pass a vehicle going in the direction in which you are going, on which side of the center of the traveled way should you pass the other vehicle?
3. When approaching a horse-drawn vehicle or a horse upon which a person is riding, what do you understand is your duty under the laws of Massachusetts?
4. Mark on the diagram the path you should trace in going from Ashland street into Salem street, assuming that you wish to go to Medford. Indicate also the path you would take if you were going to Malden, assuming in each case that the automobile is to start at the point marked "A" on the diagram.
5. As you approach Salem street, describe in detail how you would operate the automobile and just what you would do.
6. Where, in accordance with the automobile law, should the operator's license and the certificate of registration be when a motor vehicle is being operated?
7. Where should the badge of a professional chauffeur be worn when he is operating?
8. Describe how the number plates should be placed on an automobile, and give the rules of the Massachusetts Highway Commission concerning them.
9. During what period should the lighted lamps be on an automobile under operation?
10. What special appliances and safeguards does the law require to be on every automobile?
11. What precautions is an operator required to observe on leaving an automobile in any street, road or public place?
12. What is the penalty for operating an automobile recklessly or while under the influence of intoxicating liquor?
13. When about to leave the garage, shop or place of business of a manufacturer or dealer in a car owned or controlled by a manufacturer or dealer, what is the duty of the operator?
14. What is the provision of the law concerning the attachment of number plates assigned to a motor vehicle to another vehicle to which they do not belong, and concerning the obscuring of the figures on number plates to conceal the identity of a motor vehicle?
15. Define "thickly settled or business part" of a city or town, as used in the automobile law.
16. What speed, under the automobile law, should never be exceeded by a motor vehicle?
17. In excess of what speed, outside of the thickly settled or business part of a city or town, is the rate of speed prima facie evidence of improper operation?
18. In excess of what speed, inside the thickly settled or business part of a city or town, is the rate of speed prima facie evidence of improper operation?
19. In excess of what speed on approaching a crossing of intersecting ways, in traversing a crossing of intersecting ways, or in going around a corner or curve in the highway where the operator's view of the road traffic is obstructed, is prima facie evidence of improper operation?

GEORGIA WILL HAVE AN AUTO LAW.

ATLANTA, GA., May 4.—A bill will probably be introduced at the coming session of the legislature regarding automobiles. The proposed legislation is similar to what has been adopted in a number of other States. The law requiring the registration of owners of automobiles with the Secretary of State is the kind which is now wanted for Georgia. It also provides for registering the name of the owner and his chauffeur. Such a law as the present New York State statute would be considered generally satisfactory by the automobilists of Georgia.

ILLINOIS AUTOMOBILE BILL MAY PASS.

SPRINGFIELD, ILL., May 6.—Indications are that the automobile bill prepared by the Illinois Automobile State Association will become a law. President Sidney S. Gorham has been doing some energetic work. Last week, when the bill was advanced to third reading in the House, Mr. Gorham incurred the wrath of the presiding officer by his persistent lobbying, he urging members to vote against amendments.

AUTO APPRENTICESHIP FOR FRENCH ARMY OFFICERS

PARIS, May 1.—A course in automobile construction has been added to the curriculum of the Ecole Polytechnique, at Paris, the government school in which are trained the cadets for the artillery and engineering services of the French army. M. Darracq has loaned a chassis to be used for demonstration purposes in the school, and as a send off to the new branch of instruction invited the military cadets to visit the huge factory on the banks of the Seine, where are produced such varied types as single-cylinder runabouts and 200-horsepower racing monsters. Over a hundred "Pipos," as the polytechniciens are popularly termed, accepted the invitation and spent a couple of hours wandering through the works with M. Darracq and his most distinguished engineers as guides. Taximeter cabs, small runabouts, and powerful Darracq-Serpellet steamers have called for separate buildings, making the Darracq factory now the largest automobile works in France. Much interest was shown by the military cadets in the Darracq apprentice shop, in which 80 youths undergo a three or four years' training to fit them for positions in the works.

In our illustration the future army officers are shown around a six-cylinder chassis, the features of which have been explained to them by one of the engineers. M. Darracq is standing on the extreme left, Paul Ribeyrolles, chief designer, is in the center, and M. Vacherot, business director, is on the extreme right.

Although the French military authorities own but a small number of automobiles, a large quantity of material is put at their disposition through the operation of the conscription laws. In case of necessity the army can requisition thousands of automobiles now in private service and can call to the colors the pick of the mechanical world at a few hours' notice. Thus the method of making use of the automobile as an auxiliary of the army is entirely different to that of countries where military service is voluntary.

After two years active service in the army, every Frenchman must serve two periods of twenty-eight days each with the colors, followed by a couple of periods of thirteen days each, and is liable to be called on for active service in the army until the age of 45. Not only is he required personally, but his automobile, or any other vehicle he may possess, must be put at the disposition of the military authorities at certain intervals. When called upon to pass his twenty-eight days in the field, the reservist, if he is the happy owner of an automobile, takes his machine with him, is attached to the headquarters staff, and passes a much easier four weeks than if he had a knapsack slung on his back and a rifle over his shoulder. Occasionally a rich reservist will provide not only his machine, but a chauffeur in addition. Most of the cars used in the *grands manoeuvres* are supplied in this manner. Among the officers there are a certain number thoroughly versed in automobiling and capable of organizing an automobile corps to the best advantage from the diversified material placed at their disposition at all the

great mobilizations. The new course at the Ecole Polytechnique will tend to increase the number of such men, and even though they may not all become experts of the highest order, they will have a knowledge of the automobile in general and be better fitted to make use of this auxiliary in time of war.

Among the officers having paid special attention to the automobile for army purposes none is better known than Captain Genty, who figures in all the important French automobile races under the *nom de guerre* of De la Touloubre. Familiarly he is known as *tant que ça peut*, which may best be translated by "never give in." In the Ardennes and last Gordon Bennett on a Darracq, in the Grand Prix on a Bayard-Clément, De la Touloubre has shown himself a daring driver and skilled mechanic.

Only a few days ago an example was afforded of the part private automobiles would play in the army in case of mobilization, at the Vincennes garrison. Orders were given for all machines available for service in that district to be assembled at the old fort. Seventy automobiles of every possible type gathered

for the peaceful mobilization, among the drivers being such well-known automobilists as M. Dumont, the son-in-law of M. Clément, with a Bayard-Clément, Pawlowsky, the motor journalist, and Edmond, the Renault racing driver. Instead of the summary inspection to prove that the machines were capable of performing the service that the Government may demand of them, Captain Genty made a speech to his chauffeur reservists, telling them that it was his intention to put them to a practical test. "En avant," and the battalion of Pan-



EXPLAINING FEATURES OF DARRACQ "SIX" TO FRENCH MILITARY CADETS.

hard, Renaults, Brasiers and others was led into the hilly district in the neighborhood of the Marne. After four hours' traveling, including a grade of 18 per cent., which they were not all able to negotiate, the troop was led by its captain back to the garrison and dismissed from service.

There are probably about 250 machines belonging entirely to the army and in constant service. All of these are used for transport work and are all of special design to meet the requirements of the particular branch of the army in which they are used. The major portion are naturally designed for carrying ammunition and stores; a smaller number have tank bodies for the rapid transport of water, and a few are employed in the red-cross service. Delahaye, Peugeot, Dietrich, Gillet-Forest and Panhard are the firms having supplied most of the army vehicles. Drivers and mechanics for these machines are at hand in the young workmen who have left the automobile factory for a couple of years to wear the ill-fitting uniform that the patrie provides free. At the present moment Albert Clément is undergoing a three years' military training, and there are always hundreds of others, less conspicuous in the eyes of the public, but just as capable of handling a military automobile wagon as the dashing driver of the Bayard-Clément factory. Conscription provides the fast machines needed for officers' use.

HEARD IN AND ABOUT THE CLUB ROOMS

Quaker City to Attend Wilkes-Barre's Big Climb.

PHILADELPHIA, May 6.—Knocked about from pillar to post in its efforts to secure a suitable course for its Decoration Day hill climb, the Quaker City Motor Club, at its regular monthly meeting at the Majestic, decided to abandon the event entirely. While Monk's Hill, the course finally decided upon by the Contest Committee, had not been forbidden them, the glowing accounts of the fun in store for the Quakers if they would drop their climb and go up to Wilkes-Barre and contest for the prizes there, turned the balance in favor of the latter.

The new scheme had an ardent advocate in C. W. Matheson, president of the Matheson Company, who came all the way down from Wilkes-Barre and talked so glowingly about "keys of the city" and "nothing too good for you" that the vote in favor of the change was practically unanimous.

The Quaker City members will make a three-day outing of it, going up on the 29th and returning on the 31st. To insure some plunder for the Philadelphians, the Wilkes-Barre Automobile Club climb committee will add a couple of special events open only to them. Quite a few Quakers, however, will also enter the open events.

Baltimore's Club to Have Touring Series.

BALTIMORE, May 6.—The first of the series of the H. M. Rowe touring contests, which are to be held under the auspices of the Automobile Club of Maryland, will take place June 7. The remaining two of the series will be held in September and October. The tour, which will be held in June, will be from this city to Hagerstown and return, a distance of 150 miles, while the next run will be over 200 miles, and the last run will be 400 miles. The contests will differ from the Glidden tours in that no professionalism will be allowed, and the owners will be compelled to drive their own cars. A handsome trophy will be awarded to the winner by Dr. H. M. Rowe, one of the automobile enthusiasts of this city.

Arrangements are being made by the local organization to entertain over 800 children on June 12, which has been set aside by the American Automobile Association as Orphans' Day. The children will be given a ride through the city and the Green Spring Valley, after which they will be entertained at luncheon. The automobiles necessary will be furnished by the Automobile Club of Maryland and the garages.

Committee Chairmen for Wilkes-Barre Auto Club.

WILKES-BARRE, PA., May 6.—The Wilkes-Barre Automobile Club officers are busily engaged on the plans for the May 30 hill climb, the scene of which will be "Giant's Despair," up which a successful contest was run last year. President P. A. Meixell has named C. W. Matheson, W. E. Steelman, Laning Harvey and George Lee as a committee to decide upon the events and also complete arrangements with the Quaker City Motor Club, of Philadelphia, for the endurance run from that city to Wilkes-Barre. The regular committee chairmen named by President Meixell are as follows: Good roads, R. B. Vaughn; membership, W. F. Newberry; entertainment, E. W. Davis; club runs, P. A. Wright.

Yale's Autoists to Have Another Meet.

NEW HAVEN, CONN., May 6.—The recently-organized Yale Auto Club will hold its second auto meet at the Branford Driving Park on the afternoon of May 11. The list of events includes motorcycle races, open and college races for touring cars and racers. Gold, silver and bronze medals will be awarded to the winners in the different events. Entries should be sent to W. P. Morden, 124 Wall street, New Haven.

Buffalo Club Answers the Bison City's Mayor.

BUFFALO, N. Y., April 6.—The Automobile Club of Buffalo has answered the Mayor's criticism of the club's action in engaging a former Supreme Court justice to test the legality of the new vehicle ordinance requiring automobilists to pay an annual license of \$5 each. In its statement the club says:

"In view of the criticism of the Mayor, the Automobile Club of Buffalo desires to make its position clear with reference to the recent ordinance imposing a tax upon automobiles for the use of highways in the city. This ordinance was passed in total disregard of a general law of the State, which forbids any municipality enacting ordinances the effect of which is to exclude automobiles from the free use of highways. We purpose testing the validity of this ordinance in the courts. We have always assumed that it is one of the inalienable rights of a citizen, either individually or in conjunction with others affected in like manner, to ask for a judicial decision as to the validity of any law which may affect him either in person or property, and we cannot see how the exercise of that right is a fair subject for criticism.

"If this city can impose such a tax, then other municipalities may assume the right to tax automobiles for the privilege of passing over their highways, whether the owners be resident or non-resident, and the cumulative taxes thus imposed would become practically prohibitive of the enjoyment of our property. The ordinance imposes a tax of \$5 upon automobiles, while other vehicles are taxed \$1 or \$2. Such discrimination cannot be justified upon a fair comparison of the wearing effect on the pavements between automobiles and other vehicles."

A total of sixty-four applications for active membership were favorably received at last Saturday's meeting of the Automobile Club, bringing the total membership up to 711. With the exception of the Automobile Club of America, the Buffalo club is now the largest individual automobile club in the world. Of course, not all members live in Buffalo. However, local autoists appreciate the value of the club membership. During the past winter thirteen objectionable bills were brought up at Albany, but were defeated principally through the efforts of the Buffalo club.

Exciting Election of Newark's Flourishing Club.

NEWARK, N. J., May 6.—The annual election of the New Jersey Automobile and Motor Club to-night was the most exciting affair in the history of the organization. If the Chancery Court decides that proxies are allowable, the following ticket was successful: President, Angus Sinclair; vice-president, L. T. Wiss; treasurer, J. C. Coleman; secretary, H. A. Bonnell; trustees, J. H. Wood, W. F. Kimber, W. C. Crosby.

With the 135 proxies cast and counted, Mr. Sinclair received 198 votes; Mr. Wiss, 203; Mr. Coleman, 207; Mr. Bonnell, 213; Mr. Wood, 201; Mr. Kimber, 197; Mr. Crosby, 198.

The independent nominees received the following votes: President, William C. Shanley, 97; vice-president, Frederick C. Pratt, 92; treasurer, William I. Fisk, 88; secretary, Leslie T. Ward, 82. Trustees: Charles W. Baker, 100; Edison Z. Seitz, 93; Dr. Frank B. Meeker, 96.

It is expected that there will be a quick decision from the Chancery Court on the constitutionality of voting proxies, the club being incorporated under the State law.

Bridgeport Autoists Announce Their Hill Climb Program.

BRIDGEPORT, CONN., May 6.—Considerable interest is being displayed in the hill-climbing contest to be held at Sport Hill, Easton, on May 30, under the auspices of the Automobile Club of Bridgeport. The hill, which is one of the best known in Eastern Connecticut, and is five miles from Bridgeport, is about

one and a quarter miles in length, and has some steep grades.

The events have been arranged on the basis of selling price. Cars selling up to \$1,000 inclusive in class 1; up to \$2,000 inclusive in class 2; up to \$3,000 inclusive in class 3; over \$3,000 in class 4. Free for all, open to stripped touring cars and stock runabouts up to \$5,000, will compete in class 5. Entry fee is \$5. Elegant and valuable silver prizes will be awarded winners in all classes. A. L. Riker will be marshal, and the timing of the cars will be in charge of A. K. L. Watson and Archibald McNeil. Chairman Ralph M. Sperry, of the hill-climb committee, announces that all events are open, and autoists from all sections are invited to attend.

St. Paul Automobile Club to Have a House.

ST. PAUL, MINN., May 6.—A clubhouse and garage for the Automobile Club of St. Paul is assured and work upon a building, 75 by 138 feet and two stories high, will be begun at once. The building will be located on Fourth street, between Minnesota and Cedar streets, in the heart of the city. The definite announcement of the success of the clubhouse plans was made at a banquet given by the club at the Commercial Club last week. The building will be erected by Oscar L. Taylor for the club, and will have a garage on first floor and commodious rooms on the second. The membership of the club is now 125, and it is expected that it will reach 200 during the summer.

The banquet of the club was an enthusiastic affair, with representatives of the Minneapolis Automobile Club and other State association clubs in attendance. L. A. Wood acted as toastmaster and President Frank M. Joyce, of the Minneapolis club; Ambrose Tighe, president of the St. Paul Club; Judge Finchout, George H. Daggett, of Minneapolis, and others made addresses.

Annual Gates' Mill Climb of the Cleveland Club.

CLEVELAND, O., May 6.—Without doubt the hill climb of the Cleveland Automobile Club at Gates' Mill, east of Cleveland, this year will prove of greater interest than ever before. So many manufacturers and representatives of foreign cars are making inquiries regarding the event that it is likely to take on an aspect of international importance. In part the open challenge of F. B. Stearns against all comers is responsible for the attention that has been attracted toward this event. As yet the entry blanks have not been issued, but many inquiries have already been made for them.

The hill at Gates' Mill is being prepared for the test in the best manner possible. The only really dangerous curve has been banked and the course graveled and steam rolled. It will be in admirable shape in every way.

First Run of the City and Country Motor Club.

NEW YORK, May 6.—The first run of the City and Country Motor Club to the Lake Mahopac clubhouse was held yesterday, some twenty cars participating in the pleasure jaunt. On the return J. Stuart Blackton was the victim of a "holdup" in the village of Briarcliff, the rural Justice of the Peace giving the prisoner the choice of one of three penalties, the court announcing its decision in this manner: "Either loan me \$200, which you may call bail; stay in jail here until next week; or pay a fine." The victim decided to pay the \$30 fine, realizing that he was in the hands of the enemy.

The Cohoes Automobile Club, of Cohoes, N. Y.

COHOES, N. Y., May 6.—The Cohoes Automobile Club has been formed with a membership of 35 and the following officers: President, Dr. J. H. Mitchell; vice-president, J. Henry Williams; treasurer, F. J. Gardiner; secretary, E. R. Clifton. The club is a member of the New York State Automobile Association of the A. A. A. Meetings have been held at the garage of Kennedy & Son, but subsequently other quarters will be obtained.

**THE AUTOMOBILE CALENDAR.
AMERICAN.**

Shows and Meetings.

- May 28-31.....—Indianapolis, Ind., Annual Meeting American Society of Mechanical Engineers.
- Oct. 31-Nov. 7...—New York City, Madison Square Garden, Eighth Annual Automobile Show, Association of Licensed Automobile Manufacturers.
- Nov. 30-Dec. 7...—Chicago, Coliseum and First Regt. Armory, Eighth Annual National Automobile Show and First Annual Commercial Vehicle Show, National Association of Automobile Manufacturers.

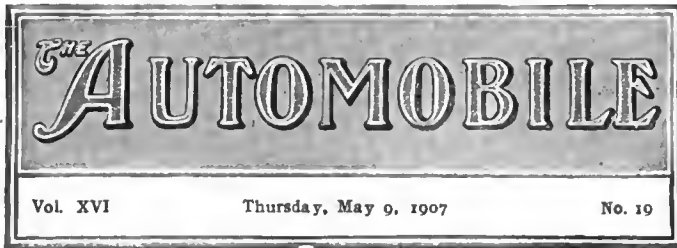
Races, Hill-Climbs, etc.

- May 30.....—Wilkes-Barre, Pa., Second Annual Climb, "Giant's Deepair," Wilkes-Barre Automobile Club.
- May 29-31.....—Philadelphia to Wilkes-Barre and Return. Endurance Run of the Quaker City Motor Club.
- May 30.....—Chicago, Memorial Day Race Meet of the Chicago Motor Club.
- May 30.....—New York City, Race Meet, Empire City Track, for Oldsmobile cars.
- May 30.....—Bridgeport, Conn., Hill Climb, Bridgeport Automobile Club.
- May 30-June 1...—Newark, N. J., Three-day Endurance Run of the New Jersey Automobile and Motor Club.
- June 12.....—National Orphans' Day, instituted by the American Automobile Association.
- June 19-22.....—New York City, Sealed Bonnet Contest, under the auspices of the Automobile Club of America.
- June 20.....—Albany, N. Y., Annual Tour of the Albany Automobile Club; Route, via New York and Asbury Park, to Atlantic City.
- June 27-28.....—Chicago, Elgin-Aurora Reliability Run, Chicago Motor Club and Chicago Automobile Trade Association.
- July 10.....—Cleveland, O., Start of Fourth Annual Tour of the American Automobile Association, for the Glidden Trophy. Finishes in New York City on or about July 23.
- Aug. 1.....—Algonquin, Ill., Hill Climb, Chicago Motor Club and Chicago Automobile Trade Association.
- Sept. 5.....—Chicago, Cedar Lake Economy Run, Chicago Motor Club and Chicago Automobile Trade Association.
- Sept. 14.....—Albany, N. Y., 95-mile Road Race, under the auspices of the Albany Automobile Club.

FOREIGN.

Races, Hill-Climbs, etc.

- May 15-31.....—Belgium, Industrial Vehicle Trials, Automobile Club du Nord.
- May 18-21.....—Milan, Italy, Touring Club Trials.
- May 22-25.....—Irish Automobile Club Reliability Trials.
- May 24-27.....—Voiturette Contest, Automobile Club of Austria.
- May 28.....—Isle of Man, Tourist Trophy Race, Automobile Club of Great Britain and Ireland.
- May 30.....—Isle of Man, Heavy Touring Car Race, Automobile Club of Great Britain and Ireland.
- June 3-12.....—Paris, Electric Vehicle Competition, Automobile Club of France.
- June 3-12.....—Herkomer Cup, Automobile Club of Bavaria.
- June 10.....—Pekin-Paris Automobile Tour, Start from Pekin, Inaugurated by "Le Matin."
- June 14.....—German Emperor's Cup, Taurus Circuit, Imperial Automobile Club.
- June 20-22.....—American Gold Cup, Start from New York of European Tour for American Cars, Georges Dupuy, secretary, 1402 Broadway, New York City.
- June 14-29.....—Scottish Reliability Trial, Scottish Automobile Club.
- July 2.....—Grand Prix, Automobile Club of France.
- July 14, 1908.....—Paris to London, Aerial Race.
- July 15-18.....—Ostend Week, Record Trials, Automobile Club of Belgium.
- July 21.....—Ardenne Circuit (Belgium).
- July 31.....—Liederkerke Cup for Touring Cars, Ardenne Circuit, Belgium.
- July 31-Aug. 8...—Belgium Regularity Contest for Touring Cars, A. C. of Belgium.
- Aug. 1-7.....—Criterion of France, 1,750 Miles Touring Competition and 250-mile Race for the Press Cup, A. C. of France.
- Aug. 11-29.....—France, Coupe de Auvergne.
- Sept. 1.....—Italy, Brescia Circuit, Florio Cup, A. C. of Italy.



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Is There a Place for the Second-Hand Car? In the early days of the great wave of popularity of the bicycle that swept over the land, models changed so quickly and so radically that the dealer looked askance at the purchaser who requested that his former mount be taken in trade. History repeated itself in the case of the automobile, and for the first three or four years the dealer confined himself to new cars, and most of the dealers would have preferred to see things remain thus. In fact, many of them set their faces resolutely against inaugurating the practice, but all to no purpose. Not that all have been compelled to adopt it, but circumstances proved too strong for many, while others have done so as a matter of policy. The time was not long in coming when the purchaser who invested in a new car every season held his order until he could dispose of his used car. This buyer represented a relatively large class, and it paid so well to cater to him that the dealers found it profitable to bid for him, and thus his car was taken off his hands, and the practice imperceptibly took hold. Except for the fact that it necessitated larger quarters for the storage of such cars and the maintenance of a larger repair force, there appears to be no reason why there should have been any hesitation about adopting the practice, except on the part of the manufacturer, who considered it wholly out of his line. But how about the common garden variety of second-hand car and the second-hand dealer? A thousand and one reasons bring as many used cars into his hands; they are in all conditions and of all sorts, but in many cases much of the depreciation is fictitious. It is not actual mechanical depreciation, as measured by

the normal life of such a piece of machinery with reasonable care, and it is probably safe to say that a great many, if not a majority of the cars that find their way into the mart of the cast-offs, have a useful life of several years before them—again with reasonable care, of course, for abuse shortens mechanical as well as human life. Is there a place for such cars? The thousands of them that change hands ever year would appear to give an emphatic affirmative to the question.



There Will Soon Be No More Worlds to Conquer. When the automobile first distinguished itself by demonstrating its ability to cross the American Continent in record time, it was justly considered that here, indeed, was a conquest that would be hard to surpass. Since then the Continent has been crossed and recrossed, and, though the first attempts were considered something of a marvel in the shape of rapid travel under such trying conditions, the time has been cut in half. It is not too much to say that granted half the advantages possessed by the railway train in the shape of a solid roadbed with easy grades and curves, the automobile could make a cross-continental record, lowering the time of the best through mail trains.

Trips such as those referred to have become so tame by frequent repetition that enthusiastic believers in the capability of the auto have had to go further afield for something worthy of their mettle. Hence the Pekin-Paris propaganda, which is not merely a test of endurance, but a race. The daring nature of the project is such that no reward would appear sufficient to induce competitors to enter in such a trial, yet with no stake other than the glory of achievement, no less than fourteen cars have been shipped to the Far East with some of their drivers and the remainder have already left by rail. There is no reason to doubt that at least some of the competitors will succeed in traversing the 8,400 miles—much of which is an unknown wilderness—in what may be considered record time. Among the drivers there are some who have demonstrated their ability to take an automobile anywhere that four wheels can be made to run, so that it would seem as if the automobile would soon have no more worlds to conquer.



The Automobile as an Aid to Fire Fighting. With the present high factor of reliability that the past few years of improvement have brought it, the automobile stands second to nothing in its unification of all those qualities that go to make the fire-fighting machine par excellence. Its speed, ease of control, weight-carrying capacity and wide radius of action place it at once so far beyond any other known method of transporting fire apparatus to the scene of action as to render any comparison utterly out of the question. Numerous instances of its value in this rôle could be brought to bear. But a short time ago the services of three automobiles saved a Western town from total destruction; it was without adequate fire protection and half the town had already gone down before the fire, when the automobile saved the day. To do so, it had to cover twenty miles of rough road intervening between there and the nearest help. Other instances of an equally convincing nature are not wanting, and in all of them the rôle is played by the stock touring car. How much more effective would the specially designed machine, not alone providing its own motive power, but also carrying its own fire-fighting apparatus, prove in such emergencies? The question is readily answered at home as well as abroad. Paris and other Continental cities have come to regard the automobile fire engine as a matter of course; it represents an innovation that was inaugurated two or three years ago in quite a few instances, and not alone its permanency in this rôle, but its eventual usurpation of it to the exclusion of the horse is looked forward to at no distant day. Progress has not been so rapid here, but the all-round capacity of the automobile for this work makes it only a matter of time when it will be the mainstay in serious fire-fighting the world over.

LAYING OUT THE A. A. A. TOUR ROUTE.

On Tuesday morning last Dai H. Lewis, secretary of the Touring Board of the American Automobile Association, left Buffalo in a Pierce-Arrow six-cylinder to map out the course for this year's A. A. A. tour. He is accompanied by a photographer, and Chairman F. B. Hower, of the Touring Board, under whose direct supervision the work is being carried out, will be with him a part of the time. Distances are to be carefully measured, and all landmarks and turns in the road are to be noted. In the tour itself, the "Big Six" Pierce car will probably act in the same rôle as last year—that of picking up the checkers, it having been secured as the chairman's official chariot.

After due consideration, it has been decided to make the Hower trophy, which is now on exhibition at the Harrolds Motor Car Company's salesrooms at 1789 Broadway, an individual, instead of a club prize, to be won permanently by one entrant. The trophy is a four-foot bronze figure entitled the "Signal Man," who holds a torch above his head in one hand, a spear at rest in the other, while a fire burns at his feet. Its relation to automobiling is problematical, though there is no doubt as to its status as a work of art. A new set of rules, under which it is to be competed for, are now being compiled.

The most important announcement in connection with the tour made up to the present is to the effect that the tourists will go "a-Cooking" it this year, instead of having to rely upon the efforts of amateur advance men for proper hotel accommodations. It will be easier to do this, as nearly all the stops will be made in large cities. No stone is being left unturned by the committee, however, to insure satisfaction for all concerned. Work was undertaken several weeks ago, and the hotels will be obliged to sign contracts not to raise their rates in any way. A professional advance man engaged from Thomas Cook & Son's will precede the tourists and make all arrangements. He will carry a complete list of the occupants of each car and of the parties traveling together, and will inspect rooms and make all allotments, leaving his record for the checker-in at each point when he goes ahead. The checker-in will hand each arrival a card giving full information as to where cars are to be garaged, the name of the hotel, and the numbers of the rooms. It is thought that the services of an experienced professional should result in obtaining as nearly as possible the accommodation that each tourist desires. The advance man will keep in communication with the managers of the tour by telephone.

FIRST ENTRY FOR VANDERBILT CUP RACE.

Although regulations for the next Vanderbilt Cup contest have not yet been issued, a car has already been entered for the great American automobile race. The early arrival is the 85-horsepower B. L. M. machine which was entered for the elimination trial last year, but was not completed in time to participate.

Announcement is made by the Royal Motor Car Company of their intention to construct two high-powered flyers for the Vanderbilt Cup race, and of the return of Robert Jardine to the racing game. The two machines will be strictly American, being built without the help of foreign designers, designs or materials. E. D. Shurmer, president of the company, expresses his confidence in their ability to make a creditable showing.

The three Thomas racers which have been under construction during the winter for the next Vanderbilt Cup race will be ready to turn over to their drivers for the preliminary tests by June 1 at the latest. They might have been put on the road by May 1, but positive orders were given some time ago that there should be no hurry in the assembling. However, with the picked men in charge and the experience they have had on racing cars, the work has progressed much faster than was expected. With the motors especial care has been taken; they are now on brake test and will be kept there for two weeks at the least, and will be given road practice after June 1.

ASSOCIATED AUTOMOBILE CLUBS OF N. J.

TRENTON, N. J., May 6.—W. F. Sadler, Jr., is the new president of the Associated Automobile Clubs of New Jersey, and it is anticipated that the State organization of the A. A. A. will greatly increase in membership during his administration. With K. G. Roebbling, Mr. Sadler organized the Mercer County Automobile Club, and these two were prominent in the fight against hostile



PRES. W. F. SADLER, JR.

automobile legislation in 1905, their efforts being quite successful. In 1906 the Frelinghuysen bill occupied the center of the stage, and though it passed with features objected to by automobilists, there were several classes stricken out which have made the measure still more onerous. Upon the Trentonians devolved the burden of the work, but, of course, the backing of the State body was a factor in the effort to stem the tide of drastic lawmaking.

J. E. Gill, another member of the Mercer County Automobile Club, is secretary and treasurer of the State organization, the other directors of which are the following: Judge James B. Dill, Automobile Club of New Jersey; F. R. Pratt, J. F. Baker, New Jersey Automobile and Motor Club; W. G. Norwood, North Jersey Automobile Club; Walter E. Edge, Atlantic City Automobile Club; K. G. Roebbling, Mercer County Automobile Club; W. N. G. Clark, Monmouth Automobile Club; Col. F. M. Barksdale, Automobile Club of Cape May; Dr. F. C. Ard, Union County Automobile Club.

WISCONSIN'S A. A. A. STATE ASSOCIATION.

MILWAUKEE, Wis., May 6.—At the May 16 meeting the Wisconsin State Automobile Association will elect its officers. These are the probable selections for directors: Neal Brown, Wausau; C. O. Josslyn, Oshkosh; F. H. Blodgett, Janesville; Dr. L. F. Bennett, Beloit; W. G. Menzen, Fond du Lac; Judge W. S. Stroud, Portage; E. Roy McCanna, Burlington; Rich T. Robinson, Racine; C. A. Harper, Madison; A. R. Hoard, Fort Atkinson; Charles T. Jeffery, Kenosha; F. P. Hixon, La Crosse.

Three directors from the Milwaukee club will be named, and Secretary James T. Drought will undoubtedly be one of the directors selected.

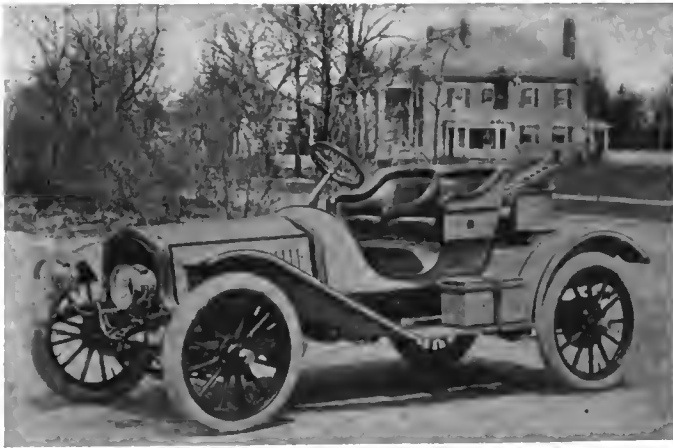
The officers will be selected from among the directors, and it is probable that either Neal Brown, of Wausau, or C. O. Josslyn, of Oshkosh, will be selected president, while it is generally conceded that James T. Drought, of Milwaukee, will be offered the position of secretary.

GEORGIA CERTAIN TO FORM A. A. A. BODY.

ATLANTA, GA., May 5.—A large and enthusiastic meeting of the Atlanta automobile owners and users was held at the Capital City garage to discuss the formation of a State automobile association. At the meeting no plans were made toward organization, as the backers of the movement first wished to see how the owners regarded the matter. It was clearly shown at the meeting that the majority of the local owners are very desirous to have a State body, and will heartily back any movement toward organizing one.

The American Automobile Association is working hard for good roads, which is one of the most important matters that faces an automobile owner in the South.

Another meeting of the local automobile owners will be held at an early date, and it is thought plans will be perfected for an organization of a State association. As the movement is backed by the leading automobile owners, it is sure to go through.



MODEL E, AEROCAR TOURING RUNABOUT.

BENJAMIN'S FIRST NEW MODEL AEROCAR.

DETROIT, MICH., May 6.—C. A. Benjamin has just brought out his first new type of car since assuming his position as vice-president and general manager of the Aerocar Company. Although this concern build both water and air-cooled cars, Mr. Benjamin has stuck to his past reputation and is making this initial car an air cooler. The car was designed by Leo Melanowski, chief engineer of the Aerocar Company. It is of the touring runabout type and has a clean cut racy appearance. For practical service this new model will meet a demand that has been given but little consideration. It is the requirement of the suburbanite in having a car with which he can carry a trunk, or two trunks, if necessary, from the station or city to his country home. The nobby rumble seat is convenient for a third person. Underneath it is a space large enough to put a suit case, robes or wraps, where they are under lock and key. Remove two bolts and the whole back can be easily set off and left at home.

Briefly the chassis has a wheelbase of 105 inches with 34x3 1-2-inch wheels. The motor is 20-horsepower, four-cylinder, air-cooled. The new Aerocar multiple disc clutch is used. The transmission is of the sliding gear type with three speeds forward and reverse. A shaft drive with bevel gear floating differential in the rear axle is used.

The batteries are carried in a box strapped on the running board on the right side of the car. The connection between them and the coil is short, so that it is easy to locate any possible ignition troubles. There is no crawling under the car to find a defective wire. On the left running board a similar box is strapped and is used as a tool box.

The machine is finished in a French gray with black moulding, while the gear is Italian red. The upholstery is of red leather, and instead of the old tufted style has that snappy appearance that is more in keeping with the rest of the car. It makes the seats exceedingly comfortable. The price is \$2,000.

ENLARGING MITCHELL FACTORY AT RACINE.

RACINE, WIS., May 6.—The new buildings of the Mitchell Motor Car Company's factory will give between 55,000 and 60,000 square feet of additional floor space, all on the ground floor, and more than half of which will be devoted to machine shop facilities. The construction is like that of the other buildings, cement with saw-tooth roof and fireproof. The increased facilities will enable the Mitchell plant to make 2,200 cars in 1908, exclusive of commercial vehicles, the business for which is increasing rapidly.

Plans for a still larger plant have been made and accepted for 1908, and this work will be begun in the Spring of 1908, just as soon as the frost is out of the ground. J. W. Bate, the company's engineer, is responsible for some special machine tools that will assist materially in the economical manufacture of Mitchell cars. Eight cars per day is the present capacity and this is expected to be increased to ten in the near future.

AUTO A FEATURE OF A. S. M. E. MEETING.

At its spring meeting, to be held at Indianapolis, Ind., from May 28 to 31 next, the American Society of Mechanical Engineers will devote one of its entire sessions to the reading of papers on different features of automobile construction. The Claypool Hotel will be the society's headquarters during the meeting, which will be opened by an address of welcome and a response by Prof. Frederick Remsen Hutton, of Columbia University, in the auditorium of the hotel on Tuesday evening, May 28. This will be followed by a social reunion. Wednesday morning will be devoted to a business session to hear the reports of standing and special committees and to vote on amendments. The afternoon session of that day will be taken up with the report of the Committee on Standard Proportions for Machine Screws, and the preliminary report of the Committee on Refrigerating Machines. Papers will be read by Reid T. Stewart on the "Collapsing Pressures of Lap-Welded Steel Tubes;" A. F. Nagle, on "The Balancing of Pumping Engines," and "A Comparison of Long and Short Rotary Kilns" by E. C. Soper.

Wednesday evening is to be an "automobile symposium." The papers to be read are entitled "Bearings and Moving Mechanism," by Henry Hess, of the Hess-Bright Manufacturing Company; "Air-Cooling of Automobile Engines," by John Wilkinson, of the H. H. Franklin Manufacturing Company; "Materials for Automobiles," by Elwood Haynes, the Haynes Automobile Company; "Special Auto Steel," by Thomas J. Fay, and "Railway Motor Cars," by B. D. Gray. On Thursday morning, superheated steam practice will be considered from various points of view in four papers by A. R. Dodge, A. M. Greene, E. H. Foster and R. P. Bolton. Thursday afternoon and evening will be devoted to an excursion and reception. Friday morning the members will visit Purdue University, at Lafayette, Ind., *en masse*, and a professional session will be held in one of the university buildings, the subject being a continuation of the consideration of superheated steam practice, four additional papers being read by W. F. M. Goss, G. H. Barrus, H. H. Vaughn, and S. L. Kneass, supplemented by papers entitled "A Hirn's Analysis of Locomotive Test," by S. A. Reeve, and "The Heating of Storehouses," by H. O. Lacount. Other papers are expected to be read at the various sessions, but have not yet been listed. The University of Illinois, situated at Urbana, Ill., has also extended an invitation to the members to make a visit there, where they will be received by Dr. L. P. Breckinridge, professor of mechanical engineering and director of the Government research station.

SIMPLEX MOTOR CAR CO. JOINS A. M. C. M. A.

The American Motor Car Manufacturers' Association now has a total membership of 42 automobile manufacturers. The latest concern to join is the Simplex Motor Car Company, of Mishawaka, Ind., makers of the Simplex cars.

In the recent vote of the A. M. C. M. A. only one of the 42 members objected to a strenuous tour, this one preferring a pleasure trip without rigid rules. All but two voted for an average run of 125 to 150 miles per day, and one suggestion was made for a pacemaker. There was not a single objection to the rule preventing the replacing of any parts on a car that would not ordinarily be carried on a regular tour. On this point there was no difference of opinion.

DOLSON AUTOMOBILE CO. ENLARGES ITS PLANT.

CHARLOTTE, MICH., May 6.—Removal of the machinery of the plant of the St. Ann (Ill.) Kerosene Motor Company, recently purchased by the Dolson Automobile Company, of this city, is being rapidly consummated, and the new factory building of the Dolson company is making rapid progress toward completion. The new addition to the factory is a very expansive one-story structure, well lighted, and when finished will accommodate 600 workmen.



ENDURANCE RUN of the MOTOR CLUB of HARRISBURG

BUSTLING YORK, THE NIGHT STOP OF THE RUN, IS PICTURESQUELY SITUATED IN THE VALLEY.

YORK, PA., May 6.—At the end of the first day's run of the two-day endurance contest, held under the auspices of the Motor Club of Harrisburg, 15 cars of the 31 which made the trip over the 93 miles of good, bad and indifferent roads, have arrived here with perfect scores to their credit. Up to this point the run has been as successful as any of its character ever undertaken in the East, and is unmarred by serious accident.

Among the contestants are autoists famous the country over: G. Hilton Gantert, of Philadelphia, with his Oldsmobile "Mudlark"; Walter C. White, of Cleveland, with one of the cars which bears his name, and H. A. Grant, of Maxwell-Glidden tour fame. The latter had the only spill so far reported, but luckily escaped with the other occupants of the car.

The cars of the contestants, preceded by those of the officials, left Harrisburg this morning, the first at 8 o'clock and the others at one minute intervals. From Harrisburg the route led through Hummelstown and thence to Lebanon, the first checking station. From Lebanon the route led through Bismarck, Manheim, Petersburg, and Lancaster. The second checking station was fixed at the last named place. From Lancaster the run continued through Mt. Joy, Marietta, and Columbia, where the third checking station was located at the Northern Central railroad bridge over the Susquehanna river. From Columbia the run led

into Wrightsville and thence into York, to the night control at the garage of the York Motor Car Company.

First to arrive was the White pilot car, in charge of R. H. Johnston, of the New York Motor Club, from which confetti was scattered. As it sped through Center square an unknown man was run over, but as the crowd rushed to his assistance he arose unhurt. First of the contestants to come in was the first car to start and the hero of the race, a little "one lung" Cadillac runabout. On the run between Lebanon and Lancaster this car, driven by C. C. Crispen, of Harrisburg, skidded off a loose stone, dove through a fence, carrying part of it away, and then regained the road again without stop or injury. The plucky little car finished with a clean score.



REFEREE E. C. JOHNSON.

Another which met with an accident yet finished with a clean record was a Pullman car driven by James A. Kline, of York. A tree overhanging the road shaved off its top. The "Jonah" of the race was the committee car, a Winton, and No. 13, which had five punctures and came in here on a flat tire, but ahead of the checking schedule.

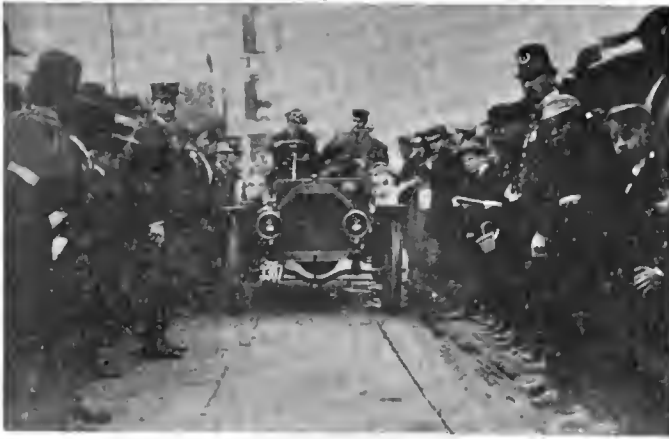
There were other hard luck stories. A Mitchell car, driven by W. O. Hickok, of Harrisburg, had a clean record until within a mile of York, where a tire burst, and 42 minutes, and consequently 42 points, were lost. J. E. Sellers, who started with a



THE START WAS MADE FROM HARRISBURG IN MUGGY WEATHER.



CHECKING STATION IN THE PUBLIC SQUARE AT LEBANON.



C. A. GILBERT, THE DRAGON CONTESTANT.



WALTER WHITE, A FREQUENT PARTICIPANT IN RUNS.

Pullman, claimed that his gasoline had been watered and was forced to fall out. Robert Shirk, of Philadelphia, with a Stoddard-Dayton, lost 84 points by getting to Lancaster 42 minutes ahead of time.

The contestants found good roads over most of the course, though a stretch of about a dozen miles between Lebanon and Lancaster was in poor condition. Many of the belated ones made up time on the run over the fine macadam pike between Wrightsville and York. They sped to York, and raced through long lines of cheering spectators to the night control station.

The last of the machines was scarcely in before a heavy shower fell and predictions were made that on the remaining 116 miles of the course the mudlarks would have their inning.

More than 100 of the autos rested here to-night and were entertained by the York lodge of Elks.

At Marietta to-day a grand reception was tendered the contestants. The fire department turned out and bells were rung as the cars passed through. Hanover removed all speed limits.

Four Perfect Scores: Pullman, Thomas, Pierce, White.

HARRISBURG, PA., May 7.—Four touring cars finished the two-day endurance run with perfect scores. They were:

- No. 8. Pullman, 40-h.p.; E. G. Irvin.
- No. 18. Thomas, 60-h.p.; S. K. Hamburger.
- No. 32. Pierce-Arrow, 35-h.p.; H. F. Rawl.
- No. 36. White steamer, 30-h.p.; Walter C. White.

In the runabout class there was only one perfect score finishing, E. L. Leinbach, of Philadelphia, with a Stoddard-Dayton, winning the trophy for this class.

The contest committee has decided to award medals and diplomas to the four winning cars in the touring class and then have their names engraved on the cups. These four entrants will be eligible to compete in next year's run, and the car finish-

ing with the nearest perfect score will receive the cup. The same cars will be contestants for other cups to be offered.

Rain fell during the entire day, and many of the clean scores of Monday's run to York were wiped out before the first control at Gettysburg was reached. There were many jokers on the route, the first being a forty-mile run over poor roads from York to Gettysburg in two hours. There were no serious accidents during the entire run, but many cars were badly damaged.

The club committee which handled the affair so successfully consisted of R. C. Halderman, chairman; W. R. Douglas, secretary and treasurer; C. C. Cumber, Andrew Redmond, S. K. Hamburger, George G. McFarland, and E. G. Irvin. The officials included E. C. Johnson, of Philadelphia, as referee; C. A. Woolson, another Philadelphian, as starter, and R. H. Johnston, of New York, as pilot.

The Philadelphia *Inquirer* to-morrow will make this comment: "There were several brilliant features of the last day's run, notably the performance of Walter C. White. He drove the best race, speaking from a conservative touring standpoint, of any man in the contest, reaching controls just a few moments before his car was due. The 'race bug' developed in many of the contestants, but Mr. White did not seem to mind how many cars passed him. It was the 'cut loose' policy of many drivers Monday, when the run was absolutely easy, that killed off their chances to-day. Mr. White's run should prove a lesson to them.

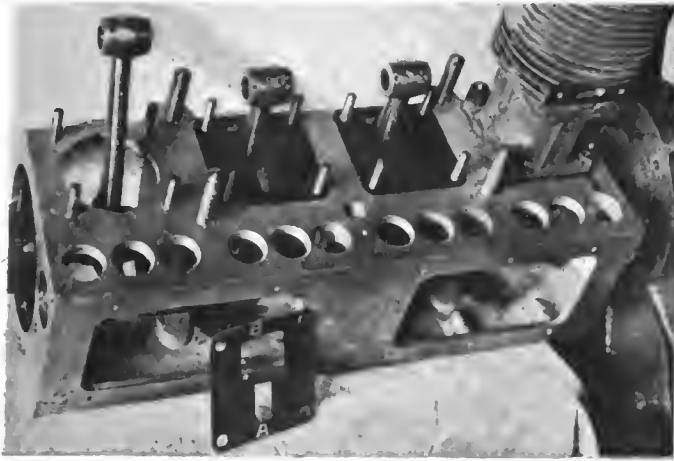
"As an automobile education to the people of the towns through which the run passed the event was most successful. Everywhere the cars were greeted with cheers and flags. A notable sight was the number of horses brought along the roads by farmers who wished to make them familiar with the machines. Every courtesy was extended by the farmers, and the caution with which cars were driven when a frightened horse was encountered left a most pleasant impression."



A. A. JONES, THE FORD ENTRANT, HAD TIRE TROUBLE.



H. A. GRANT, ONE OF THE MAXWELL PARTICIPANTS.



OIL BAFFLE PLATES USED IN THE AIR-COOLED FRANKLIN.

IMPROVED LUBRICATION OF FRANKLIN MOTORS.

Three years have now elapsed since the adoption of the auxiliary exhaust which is a feature of the Franklin air-cooled motors, and the hundreds of cars fitted with it that have been in daily use during that period show that it effectively accomplishes the design of its inventor—that of increasing the efficiency of the engine and rendering its cooling certain under the most adverse conditions possible. It has been found to have one slight drawback, however, owing to the fact that it is situated on what may be termed the non-working side of the motor—that is, the side of the cylinders that only receives the stress of the compression stroke, which is very light as compared with that of the explosion stroke. It will be apparent that with the splash system of lubrication, the oil is always thrown to the non-working side of the cylinder, and must work its way round to the other side, and as the Franklin auxiliary-exhaust is on the former, it was found that some of the oil was wasted by being discharged through it. This was particularly the case when there was an excess of oil.

To overcome this a very simple device has been evolved, and it not only does away with the objection in question, but renders the lubrication as a whole far more effective. It is termed an oil baffle-plate, and, as will be seen from the accompanying photograph of a dismounted Franklin motor, it consists of nothing more or less than a light steel stamping through which the connecting rod works. It prevents the oil from being splashed on the side of the cylinder that carries the auxiliary exhaust port and causes the greater part of the oil to be thrown against the

working side of the cylinder. Another advantage is to be found in the fact that it permits of a much higher level of oil in the crankcase, thus providing better lubrication for the big ends of the connecting rods, and maintaining a larger supply in reserve in case of the failure of the oil pump. Nor does this excess of oil mean smoking and carbonization, as is usually the case, as only a certain amount is permitted to enter the cylinder.

NEW JERSEY NOW EMPLOYS A SLEUTH CAR.

TRENTON, N. J., May 7.—State Automobile Commissioner Smith to-day placed in service a high-speed auto, and inspectors will tour the State in the machine to chase speed violators. To prevent watchers from spotting the sleuth car and giving an alarm, the color and number of the State machine will frequently be changed.

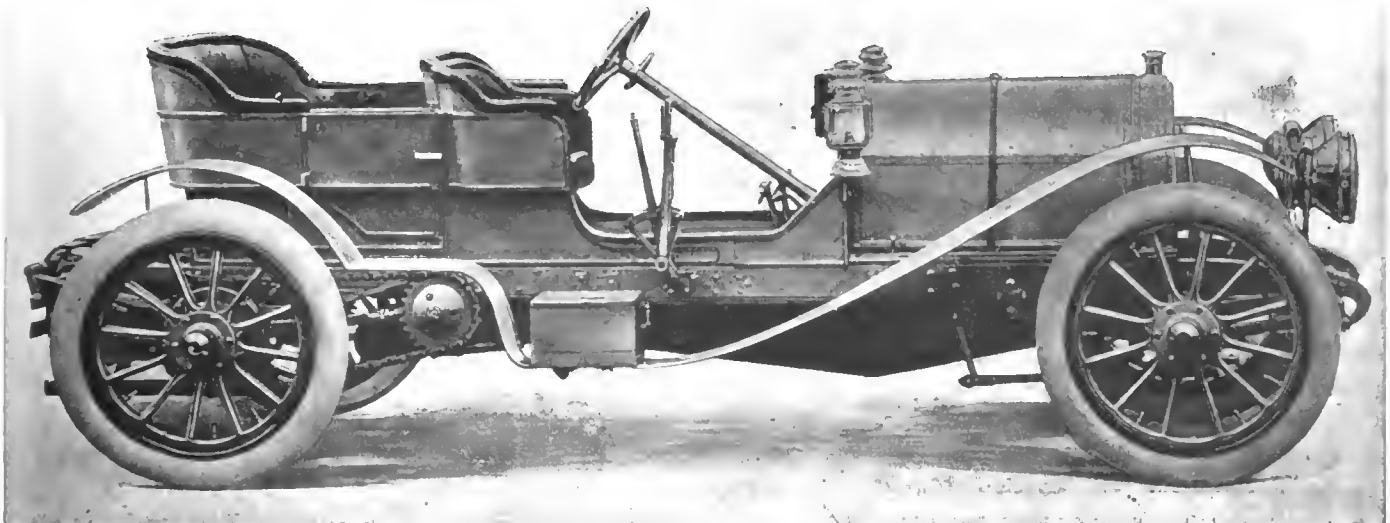
Governor Stokes has not yet signed the bill appropriating \$5,500 for the machine, and there is considerable adverse comment because of the premature purchase.

OLDSMOBILES TO HAVE A HOLIDAY REUNION.

General John T. Cutting, New York agent of the Oldsmobile, announces that there will be a reunion of Oldsmobilers at the Empire City track, Yonkers, N. Y., on Decoration Day. The parade will start from the company's Broadway store at 10 A.M., and luncheon will be served on arrival at the Empire track. A drawing for a \$2,750 Oldsmobile touring car will take place, and all Oldsmobile owners participating in the parade will be eligible, with Oldsmobile selling agents or representatives barred. However, it will be necessary for participants to fill out a card supplied by the Oldsmobile Company, of New York, giving number of engine and type and filing same before May 28.

NEW TYPE RUNABOUT FROM STEARNS FACTORY.

The latest product of the F. B. Stearns factory at Cleveland, O., is an attractive four-passenger runabout, an illustration of which is given herewith. The chassis construction is the same as is used in the firm's standard runabout, but the body is novel and interesting and calculated to attract considerable attention. It has seating capacity for four people with tonneau attached, but can be converted into a two-passenger runabout by the removal of the tonneau. It is constructed with a very rigid oak frame covered with sheet aluminum, and the upholstery is a dull black waterproof leather without tufting. Operator's seat is placed six inches ahead of the passenger's seat, in order there may be no interference with the operations of the driver. The weight of the car is distributed at the center of the frame, giving exceptional riding qualities and making the steering easy.



THE LATEST INNOVATION IN HIGH-POWERED RUNABOUTS—THE STEARNS FOUR-SEATER.



THE MAXWELL COMMERCIAL DELIVERY CAR.

IMPORTERS' EXHIBITION IN THE GARDEN.

There will be three automobile shows in New York next season. The Importers' Automobile Society, which only came into being last month, has ceased to exist, its promoters having decided to throw in their lot with the older Importers' Automobile Salon and aid them in holding an automobile show for foreign machines only in Madison Square Garden, presumably towards the end and perhaps the last week of the year. The decision was arrived at on Monday at a meeting in the club-rooms of the A. C. A. under the chairmanship of Gaston Rheims.

Those who have subscribed to the action are André Massenat (Panhard), Gaston Rheims (C. G. V.), Paul de la Chesnaye (Zust), W. H. Barnard (Pilain and Delahaye), Alexander Thakara (Westinghouse), E. Lillie (Itala), Paul Lacroix (Renault), Percy Owen (Bianchi), Emile Bloch (Motobloc), E. B. Gallaher (Brasier), Wm. Walker (La Buire). It is announced in addition that three or four other firms that were not able to attend the meeting will act in accordance with the firms above mentioned and would forward application at once for membership in the Importers' Automobile Salon.

"All members of the Salon," said E. R. Hollander to THE AUTOMOBILE representative, "will exhibit at the foreign show, and will take part in no other event. Doubtless a number of the smaller importers will join us—all will be accepted on a basis of equality—and we are certain of the finest display of foreign machines that New York has ever seen. It appeared to us that it was useless to form another importers' association when one had already been in existence for four years."



A DAY'S DELIVERY OF PEERLESS RUNABOUTS.

The picture shows the cars ready for delivery to customers from the New York City branch of the Peerless Motor Car Company.

MARSH RIM PLANT TO BE LOCATED AT AKRON.

AKRON, O., May 6.—The Marsh rim plant will be moved from Columbus to Akron as soon as enough stock ahead can be accumulated to permit the manufacturing to be discontinued long enough for the change. Nearly 15,000 sets of Marsh rims have been made by the Diamond Rubber Company for the present season, and increased facilities are necessary, which explains the removal from Columbus, where the rim is being manufactured in the works formerly known as the Bryant Steel Wheel and Rim Company.

ASSOCIATION TO CONDUCT TRACK MEETS.

The United States Motor Racing Association has been incorporated in New York State with a \$5,000 capitalization. Joseph N. Gaites, William H. Pickens, Fred T. Bailey and W. H. Oviatt are named as the incorporators. The first meet of a series in various parts of the country is scheduled for the Point Breeze track, Philadelphia, May 24 and 25, a 24-hour race for fully equipped touring cars and touring runabouts to be the feature. The meets will be conducted under the rules and sanction of the A. A. A.



NEW ROYAL FACTORY NOW BUILDING AT CLEVELAND.

The view shows the progress being made on the main factory on Gordon Park boulevard. The Royal Motor Car Company expects to have it in operation by the middle of the summer. This will add substantially to the already large equipment of this company.

ALL FORD INTERESTS TO BE UNDER ONE ROOF.

DETROIT, MICH., May 6.—The Ford Motor Company has purchased the entire assets of the Ford Manufacturing Company, located on Bellevue avenue. The latter concern was organized in November, 1905, and incorporated for the purpose of making under contract motors, transmissions, axles and other parts of the Ford runabout. Recently this plant had been held under lease, and its location about four miles from the Ford Motor Company's factory caused considerable inconvenience. With the absorbing of the younger by the older concern, there will come the beginning of a huge plant on the Highland Park property, consisting of sixty acres, recently purchased by the Ford Motor Company. Henry Ford contemplates the building of the largest automobile factory in the world, and in the financing of the plan James Couzens, secretary and treasurer of the company, is entitled to great credit for his share in this undertaking, as well as in the general conduct of Ford finances.

MORGAN MAY RUN MEET ON GALVESTON BEACH.

GALVESTON, TEX., May 4.—W. J. Morgan, the well-known promoter of automobile race meets and hill climbs, has been in Galveston for the past week conferring with representatives of the Galveston Automobile Club and the Business League. The proposition of conducting a January meet on the Galveston beach was presented and is now under consideration. Mr. Morgan is now on the way back to New York on the steamer *Denver*.

BRIEF ITEMS OF NEWS AND TRADE MISCELLANY

The St. Louis Automobile Manufacturers' and Dealers' Association has decided to hold a show from December 14 to 21.

President Asa Paine, of the Minneapolis Automobile Club, has placed his order for a Winton Model M. Mr. Paine has been a Winton devotee for several years.

Work on the big plant of the Maxwell-Briscoe Motor Company at Newcastle, Ind., has been begun, the first of the steel girders to compose the framework of many tons being raised last week.

Messrs. Pirelli, who have recently opened an American agency at 296 Broadway, New York, state that Pirelli tires will be used on the Itala car entered in the Pekin-Paris automobile competition.

The Waterloo Automobile and Supply Company, Waterloo, Ia., has purchased the business of the William Galloway Company, that city, and will conduct an enlarged garage business in connection.

The T. Alton Bemus Company, Inc., of Boston, makers of the Bemus twin-ball timer, is now located in its new quarters at 358 Atlantic avenue, having recently removed from 133 Oliver street.

In the May 2 issue of *THE AUTOMOBILE* a typographical error occurred in the advertisement of the Dolson Automobile Co., Charlotte, Mich. The wheel specifications of the Dolson "Cannon Ball" should read 36x4 1-2 inches.

The Bridgeport Vehicle Company, of Bridgeport, Conn., has recently made deliveries of special limousine bodies to N. W. Bishop and E. G. Burnham, of Bridgeport, Conn. The company makes a specialty of high-class limousine bodies.

E. F. Dean, M. D., the owner of a Model E Mitchell car, recently covered 123 miles on twelve gallons of gasoline. The run was done under ordinary conditions of the doctor's practice, with the stopping and starting it entailed, the distance being recorded by a Jones Speedometer.

Organization has been completed of the Morris Manufacturing Company, at Omaha, Neb., with a capital of \$200,000, to construct resilient wheels under the patent of J. H. Morris. Organizers of the company are C. A. Sweet, John M. Dougherty and William J. Coad.

At the automobile exhibition which recently took place at the Agricultural Hall in London, England, Continental tires were on 35 per cent. of the cars exhibited; the nearest competitor was fitted to 29 per cent.; another pneumatic tire showed on 9 per cent., and fourteen other tires completed the equipment of the rest.

A 40-horsepower Lozier will be entered in the sealed bonnet contest next month by the Lozier Motor Company. This car will be one of the regular stock cars which has been run over three thousand miles this season. This decision is in line with the policy of the Lozier Motor Company to enter all contests for stock cars promoted by the A. A. A. or A. C. A.

The new Viking car, mentioned in the April 25 issue of *THE AUTOMOBILE*, sells for \$2,500, and not \$3,000, as was erroneously stated. According to A. R. Bangs, of Boston, maker of the Viking, the car, which is of 40 horsepower and has a 120-inch wheelbase, was designed to sell at

\$2,500, and the first ones have been disposed of at this figure.

The Thomas B. Jeffery Company has shipped from the Rambler factory at Kenosha, 7,500 enameled metal signs to put up warnings to motorists on highways in all parts of the United States. The signs are sent in batches to Rambler agents, with instructions to properly letter them, giving necessary information to tourists, and to place them in position without delay.

The Waltham Manufacturing Company has secured the services of Dr. A. D. Hard, of Marshall, Minn., to demonstrate its friction drive buckboard to the physicians of the Northwest at the State medical societies this summer. Dr. Hard is an automobile enthusiast and has the name of being the first physician west of the Mississippi river to use an automobile in country practice.

Automobiles will soon be supplanting sledges and dogs in the far North, judging by a news item from Alberta, Canada, stating that nine motor cars, with more ordered, are now surprising the natives on that far Canadian frontier. According to a *Medicine Hat* journal, eight Maxwells are in commission in that town of 4,000 population, or one for every five hundred inhabitants.

Elwood Haynes, the designer and manufacturer of Haynes automobiles, has calculated that the impact of a touring car striking an immovable object at sixty miles an hour is equal to the shock it would receive if it fell from the top of a skyscraper. The shock given to the mechanism of an automobile with the ordinary clash gears when a careless change is made from the high at thirty miles an hour to the middle gear at fifteen miles an hour, is equal to the impact that the car would sustain by a vertical fall of seven feet.

That the Automobile Club of Buffalo will make an effort to retain the Glidden trophy this year is shown by the fact that a team to represent that organization has already been promised by its members. Four cars are certain to be entered, and several more may be added to the assured entries before the tour starts. The first Buffalo entry has already been made by George S. Salzman. He will drive a Thomas Flyer of 60 horsepower. Although not superstitious, Salzman was rather gratified to find that his car will be numbered 9. Last year he drove a Thomas Flyer through the Glidden tour with a perfect score, and then, as it will be this year, his car bore a big "9" on the radiator.

NEW AGENCIES ESTABLISHED.

The LaGrange Automobile Company, LaGrange, Ga., recently organized, has been appointed local agent for the Reo.

The Philadelphia Motor Car Company, with salesroom and garage at 236 North Broad street, that city, has been appointed agent for the Frayer-Miller.

The Sweeney & Nail Auto Co., 59-61 Court street, Brooklyn, N. Y., has secured the Greater New York agency for the Kissel-Kar made at Hartford, Wis.

The Aerocar Company, of Detroit, has established the following new agencies: A. D. Rivers & Co., Toledo, O.; H. A. Harmon, Portland, Me., and the American Auto Company, Cleveland, O.

The Reimers' Motor Company, Louisville, Ky., has been organized with salesrooms at Baxter avenue and Broadway, that city. The company will sell the Logan, Gale, Aurora and C. S. lines.

Boston has another new agency, the Puritan Motor Company, which has established headquarters at 43 Columbus avenue, in the Park Square auto station. The company is agent for the Dolson and the Mason.

PERSONAL TRADE MENTION.

Charles Schmidt, designer of the Peerless Motor Car Company, who has been spending the past six weeks in Europe, has returned home, arriving in New York last week.

A. W. Robbins, New York manager of the Aerocar Company, last week visited Washington and placed an Aerocar agency with J. B. Maxwell, 829 Fourteenth street, N. W.

L. H. Perlman, New York representative of the Welch Motor Car Company, entertained a score of personal friends at the closing dinner of the Pleiades Club, at the Hotel Astor, last Sunday evening.

J. R. Jamison, formerly connected with the Pope Motor Car Company, has joined the selling force of the Aerocar Company, of Detroit, as has also W. H. Howe, who has been associated with the Chicago branch of the Corbin Motor Vehicle Company.

RUSHMORE LAMPS ABROAD.

Rushmore Lamps, Limited, is the title of the English branch of the Rushmore Dynamo Works, of Jersey City, N. J., and the establishment at 49 Rupert street, Shaftesbury avenue, W., London, gives ample evidence of the favor with which these American lamps have been received abroad.



RUSHMORE LAMPS' ENGLISH BRANCH.

Their prompt acceptance on the other side is apparent from the fact that they have already been adopted as the standard equipment of all Fiat cars in England, India and the Colonies; they are carried in stock by the agents of such prominent cars as the Panhard, Isotta-Fraschini, Martini, Mer-

cedes and Wolseley, and are supplied on numerous orders. Rushmore agencies have recently been established in Berlin and Milan and the excellence of the lamps is probably most strongly attested to by the fact that Continental manufacturers are making haste to copy them. At the recent Agricultural Hall show in London, the sole American accessories exhibited are said to have consisted of a few brands of lubricating oils and the Rushmore lamps. They are used by royalty and many of the lesser lights of the nobility both in England and the Colonies.

INFORMATION FOR AUTO USERS.

New and Ingenious Accessories.—At a time when every automobilist is casting his eye over his machine and wondering what additions he needs to his outfit for the coming season, it is opportune to call attention to some of the new and useful instruments handled by the Auto Supply Co., 1733-1737 Broadway, New

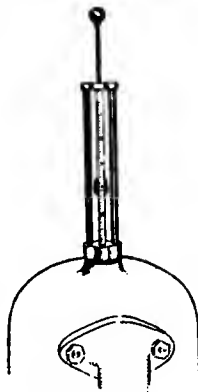
York. The compressor is a little instrument which will tell accurately the compression of the cylinders. The illustration shows the nature of the apparatus, which has simply to be screwed into the place of the spark plug. On turning the motor over slowly by hand, the compression is registered accurately on the dial. Nothing simpler could be imagined,



BROWN COMPRESSOMETER

and there is a degree of accuracy altogether unattainable by any of the older expedients.

Timing the ignition or firing point of a motor is a delicate operation, but one that must be performed if good results are to be obtained. The instrument is placed on the top of the cylinder and the metal rod passed through the compression cock. The position of the piston is indicated with accuracy by a movable stop on the rod at each side of the scale. One side of the scale is marked with English, the other side has metric measurements. The rod is eighteen inches long and the scale six inches, or 150 mm., in length. For measuring the stroke of pistons the instrument is particularly handy. Its method of use is obvious.



DEVICE FOR TIMING FIRING POINT

The good features of the flexible valve remover are its simplicity and the ease with which it can be operated in inaccessible positions. It would be difficult to imagine anything more simple: a U-shaped piece of metal with a chain attached, and a lever bar with two or three double slots bored through it. One end of the slot allows the chain to pass easily, the other side holds the links prisoner.

Smooth-On is a preparation not entirely new to the mechanical world, but one that has not previously entered into the

domain of the automobilist. It is a cement of chemical iron compounds that withstand fire, water, gasoline, steam or oil. When hard it becomes a metallic iron that expands and contracts the same as iron. Its chief use is for repairing cracks in a water jacket or leaky radiators. The defective part is first cleaned and the crack and surrounding metal are heated either by running the engine or by a gasoline torch, and while the metal is hot the cement is applied. If the defective part has been sufficiently heated the cement will run into the opening and harden rapidly. When hardened it possesses the properties of iron and can be smoothed up with a file.

Another very useful article consists of a pair of universal shears with which it is possible to cut any diameter circle or angle as easily as along straight lines. It is particularly handy in making gaskets, shimming brasses, etc.

Flexible Steel Armor for Tires.—The Kimball Tire Case Company, of Council Bluffs, Iowa, which has been making steel tire armor to fit ordinary automobile tires for the last two years, has brought out a new design for covering Dunlop or Good-year tires. The accompanying cut shows



KIMBALL STEEL TIRE ARMOR.

the manner in which a steel covering is attached to a quick detachable tire. The rings into which the clasps hook are curved in such a way that they fit tight between tire and other ring which are with the rims of that class and when tire is removed the armor stays on. Tire and inner tube can be changed the same as it can without the armor. When tire is in place on wheel there cannot be a blowout or rim cut no matter how rotten the tire is.

Triumph Magnetic Gage.—A magnetic gage which keeps a record of the gasoline put into and removed from a tank has been produced by the Boston Auto Gage Company, 14 Old South Building, Boston, Mass. It consists of a tube depending from a head that may be screwed into a bushing connected with the tank. On the under side of the head is a chamber in which is located a magnet rotatable above the end plate at the upper end of the tube, the magnet having suspended from it a ribbon shaft of rustless material embraced by a float metal that turns the ribbon and magnet more or less according to the quantity of gasoline in the tank. The head is chambered at the top to receive a small needle carrier

or compass box shown detached in the small figure at the right. This box has a dial and the needle is held in alignment with the magnet, indicating the



TRIUMPH MAGNETIC GAGE

amount of gasoline in the tank. This feature, in itself, is a very useful one, and gives excellent satisfaction to users of this gage. When the car is left, the compass box can be removed from the top of the gage and carried away in the pocket. The magnet needle is then automatically locked in position. When the box is again put on the gage it immediately unlocks the magnetic needle, and if any change has been made in the quantity of gasoline the difference will be at once indicated.

Moon Roller Bearing, Apex Friction Brakes.—By the scientific application of several well-known principles, the Moon Brake Company, Third and Porter streets, Detroit, Mich., have evolved a simple and compact type of brake for which much is claimed. The essentials of the device will be plain at a glance at the accompanying illustration of it. The apex formation provides nearly three times as much friction surface as a flat band or drum. The friction is caused by a quadruple eccentric, the power again being doubled by an eccentric within an eccentric, producing a far greater leverage than can possibly be obtained by means of single cams or link motion. The entire brake is enclosed by a dust-proof housing and runs in grease.

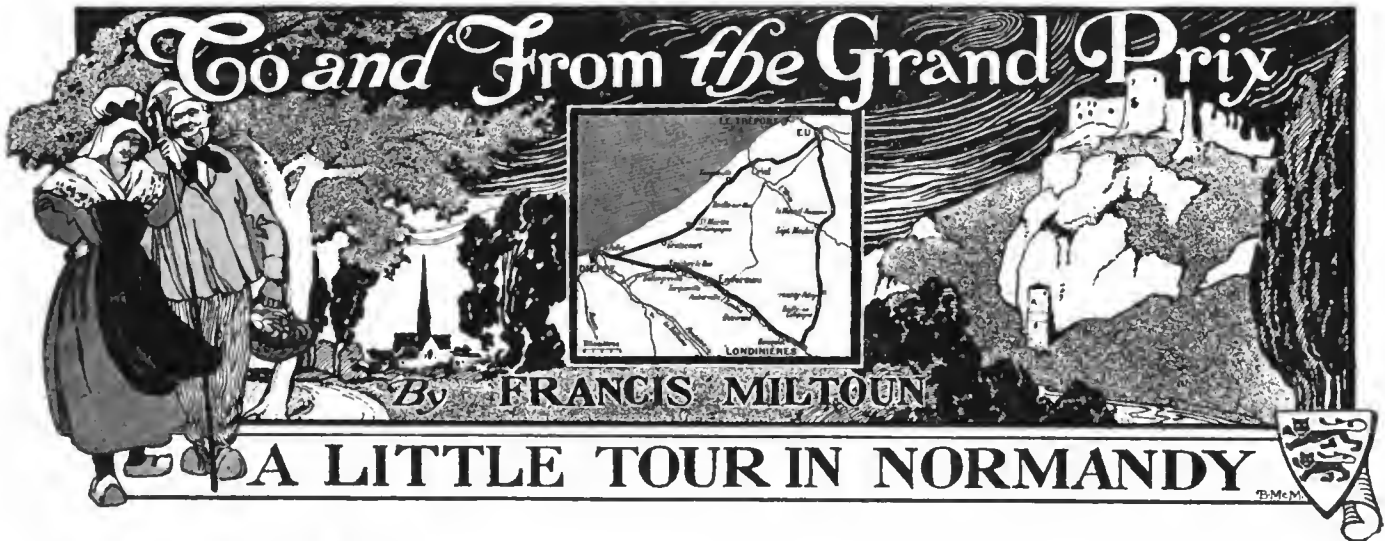


MOON APEX FRICTION BRAKE.

It may be applied as little or as much as desired, and can either be locked or released instantaneously. The makers claim that a set of Moon brake shoes will outlive any car made. A Winton car fitted with the Moon brake is used in Detroit for demonstrating.

The Pope Manufacturing Company, Hartford, Conn., has just sent forth the 1907 edition of its accessories catalogue, containing in about seventy pages a very complete description of automobile accessories and parts of both foreign and domestic manufacture.

THE AUTOMOBILE



PREAMBLE.

“LE CIRCUIT,” how to get there, and how to get away again, has been the problem with enthusiastic autoists in France ever since great “events” were inaugurated.

There is absolutely no question but that the Circuit de Normandie, the venue of the French Grand Prix for 1907, is the most accessible—to automobilists—ever known. Practically it is within easy distance of Paris, for what is the 180 kilometers from Paris to Dieppe once one is free of the dozen or twenty execrable suburban pavé via St. Germain or Pontoise. It’s bad enough either way; whichever route one takes, he wishes he had been wise enough to take the other.

Besides this the “triangle is within a half hour’s or hour’s journey by road of a dozen small and large provincial towns and cities where may be found all the accommodation that man and his modern beast of burden, the automobile, require. To be sure, one does not get *vin compris* at the tables d’hote of the inns of the small towns very often; it is the *pays du cidre*, Normandy, and the great yellow globes or carafes of cider are quite as refreshing on a hot summer’s day as wine; and *Calvados*—which is a Frenchman’s way of naming “apple-jack”—is quite as fortifying as *cognac* itself.

The accompanying sketch map and tables tell the story of accessibility and accommodation better than mere rhetoric, and so they are allowed to stand for themselves.

Rouen, Le Havre, or Dieppe are the nearest at hand, but, of course, for the great event they will be overrun for days by all sorts and conditions of men and automobiles. This, perhaps, will also be true of Fécamp, Yvetot, and Tréport, but the reverse is likely to be true of Abbeville, 30 kilometers from the northeasterly corner of the course; and Les Andelys, Gournay, or Gisors, between Rouen and Paris; or Honfleur, Louviers, or Pont de l’Arch, all of them

but from 50 to a 100 kilometers away from the scene of the race.

Coming from abroad via Dieppe, Cherbourg, Le Havre, or Boulogne, the course is readily arrived at by the roads as marked, and there is much evidence to suppose that a larger number of Americans than ever before will be present at the great French race, especially with the indomitable and persistent Christie numbered among the participants. Governmental, departmental and municipal appropriations have been made with a free hand towards the re-making of the roadway, straightening of bad curves, and even of cutting down dangerous abutting trees. Grandstand accommodations of a superior and exceedingly luxurious order have been planned, restaurants and cafés projected, and telegraphic and post-office facilities promise something phenomenal.

Enthusiasm—and the French are extravagantly enthusiastic, as we who know them best must admit—may exaggerate somewhat, but the fact is the course is admirably placed and in point of fact the best France has ever had, midway between the “Circuit d’Auvergne,” which was too mountainous, and the “Circuit de la Sarthe,” which was too monotonously flat.

HOW TO TOUR NORMANDY.

Normandy, Brittany, and Touraine are the ideal automobile touring grounds in France, if not in all the world. The stranger automobilist usually arrives in France via Cherbourg, Le Havre, Dieppe, or Boulogne. In either case he “tumbles” immediately into Normandy, as the French say. Most likely he makes wheel tracks for Paris at once, though he makes a mistake when he does it. Anyway, the round of Norman towns, as one approaches the southern boundary, comes very near to Paris, so the present itinerary takes the gay capital as the starting point. The way out from Paris, via the Route de



AT THE TRAPPIST MONASTERY.



Quarante Sous and Mantes, is through St. Germain. It's a shockingly bad bit of roadway all the way to St. Germain, 20 kilometers and mostly *pavé*, but it's unavoidable unless one goes via St. Denis and Pontoise, and then it is 25 kilometers and *all pavé*, and after Pontoise a long stretch of still worse cobblestones. The road by St. Germain and Mantes is by far the better.

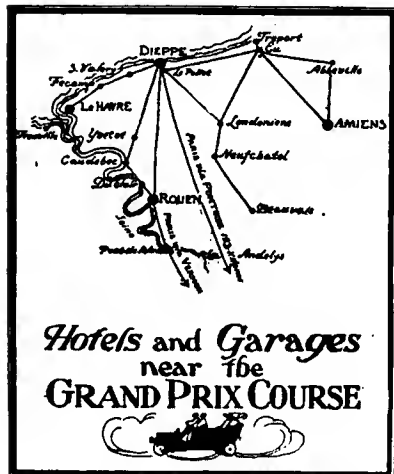
St. Germain is lovely, its château, its terrace, and its Forêt, but the town is a dirty hole, difficult to navigate with an automobile and possessed of a pirate crew of octroi officials who stop you at the barrier and would look for smuggled spirits into the barrel of your tire pump, if the idea only occurred to them.

Up and down hill and dale, with delightful prospects of the Seine Valley on the right, the great Route Nationale, No. 190—*Paris-Rouen-Le Havre*—runs for 30 kilometers to Mantes. Mantes has the votive church of Notre Dame, built, or endowed, by William the Conqueror. Practically it is a copy, as to its façade, of Notre Dame at Paris. This is all Mantes has to offer as a "sight" save the river and its bridges, and its hotels are abominable for a French town of its size. So, too, they are at Vernon, 25 kilometers further on. Don't think of stopping for lunch short of Les Andelys or Pont de l'Arch.

A French Town which Has an Auto Trap.

Between Mantes and Vernon is Rosny, with the natal château of Sully, the minister of Henri Quatre, and a little known painting by Corot in the parish church. Nearby is Moisson, and it will be an off-day if a Lebaudy "airship" isn't having a try-out in the heavens above. It is worth looking out for.

Beware of Bonnières, a half dozen kilometers further on. The



maire has posted a notice at each end of the village cutting down the speed limit to six kilometers an hour—(figure that out in miles, say three and a half, and just think what that means when, "all out," you can do an average forty). Many an automobilist, French and stranger alike, has paid the penalty here for non-observation of this warning.

Vernon is a delightfully situated Seine-side town, and turning to the

left, up the hill and through the Forêt de Bizy, is a detour of fifty or sixty miles, including Pacy-sur-Eure, Evreux, and its cathedral, and Conches, each and all of them typical Norman towns. If this detour is made, lunch either at Pacy-sur-Eure, Hotel de Lion d'Or, or at Conches at the Croix Blanche. At either you eat of the best of the Norman countryside, good beef, mutton and vegetables, and never *jambon aux œufs*, with which the hotels of the big towns regale Anglo-Saxons as a *plat special*. Curious that they size up the appetites of the English-speaking traveler as based only on *ham* or *bifteck*.

Then there are the cheeses in Normandy, too many in kind to enumerate, but always le Camembert, and sometimes Pont Salut, the best cheese in France, save, perhaps, the "fromage bleu" of Rochefort, too strong for some.

From Vernon the road by the Seine, still Route Nationale No. 190, goes straight on for 14 kilometers to the famous Côte de Gaillon, the scene of a yearly "hill climb" famous in the annals of automobilism since long years.

Une Colonie Americaine.

From Gaillon, or from Vernon if you like, cross the Seine to the right bank. Opposite Vernon is Giverny—*une colonie Americaine*, the habitant calls it, for there are anywhere from a dozen to fifty Americans there the year round, mostly artists. Years ago Madame Bodet, who ran a little grocer's shop, took a couple of American artist fellows to board—for a price so ridiculously low that one dares not mention it now—and in time a hotel grew up with an added wing every year, until to-day one may find two score of men and women—always Americans, or if not always nearly always—all painting away as if Giverny and its surroundings were the only paintable spots in France. Madame Bodet, the elder, has retired into the background and a young Madame Bodet, the wife of Gaston, who comes from Paris, has taken her place. All is lovely as of yore, but prices have gone up at the Hotel Bodet.

Down river twenty kilometers, always by that same delightful Route Départementale, is Petit Andelys, snug lying beneath the famous Château Gaillard, Richard Cœur de Lion's "Saucy Castle," built, so says tradition, in a year. The ruin of the once proud old castle is still there, on a monticule rising 300 feet or more from the river's edge. On the waterside is the Hotel Bellevue, the most delightfully situated and altogether most charming hotel between Paris and the sea. It has an inner courtyard, vine-covered and tree-shaded, and when a half dozen automobiles and their attendant paraphernalia don't fill it to suffocation one dines out in the open under the trees, and after strolls on the river bank or up to the château in the moonlight and thinks nothing were quite so idyllic in these rush-about twentieth century days.

The Hotel Bellevue is very, very good, indeed, but it is the ensemble that makes it so. The proud old aristocratic patron, Thiriet, has his own notions about what you ought to eat and how it ought to be cooked, and you eat it that way or not at all, but it's thoroughly good in quality and bountiful in quantity, and there is no *garlic* in it. You drink cider, of course, and not wine, but the *patron* makes it himself, not by squeezing the apples in a press—that's the common peasant's way, he tells you—but by simply crushing them and pouring tepid water over them and letting it run off into barrels. Eight days after it's ready to drink. Simple, isn't it!

As to who discovered Petit Andelys and Château Gaillard is in doubt. Sir Walter Scott knew it and Cotman and Turner painted it, and a dozen or fifteen years ago a yachting, coaching (and in these days automobiling) millionaire (for he is still faithful to Les Andelys and Thiriet, and turns up regularly at least once a year) came along and gave it the cachet of his favor and did some booming of it in a mild way among his friends, and so established the town as a place out of the ordinary and easily the finest place on the Seine.

Between Les Andelys and Rouen is Pont de l'Arch with a good hotel, too (Normandie), and twenty kilometers to the west

TOURING CLUB DE FRANCE	
PARIS	LE HAVRE
66K ←	→ 155K
BONNIÈRES	VERNON
1K ←	→ 9K

is Louviers, with the most wonderfully flamboyant Gothic church extant and a good hotel, the Mouton d'Argent.

Where to Dine in Rouen.

Rouen, of Jeanne d'Arc and Cathedral fame, is seventeen kilometers from Pont de l'Arch by the river road all the way.

Rouen shall have no guide-book information here; just a few words about hotels and things. There's anything one likes at Rouen in the hotel line, and in the garage line, too. The Hotel d'Angleterre on the quai, or the Hotel de la Poste on the Rue Jeanne d'Arc, are excellent establishments of the first order, with prices accordingly, but much cheaper, of course, than American prices for the same sort of thing.

For a novelty the Hotel Lisieux, on a back street running parallel with the quai, just off the Rue de la Republique, is to be recommended. There's nothing quite like it in all France. It's bourgeois, excruciatingly so, but its fare is marvellous in excellence and variety. Never has the writer seen a lay-out quite like it, and *vin* is *compris*, red or white *vin d'Algerie*, not one of the world's great *crus*, but a most pleasant drink. The déjeuner or dinner is all one's fancy will picture it, but the dessert, the sweets, the cheeses (eight or ten of these last) and the fruits will seem a dream. Go to Rouen and cut out the churches if you will, but don't miss the Hotel Lisieux. You will have to garage your machine at Adrien Menager's, near by, and that will cost you a franc, whereas otherwise you might get it sheltered free—but that's a mere nothing.

From Rouen to Caudebec-en-Caux is 35 kilometers, via Jumièges and Duclair. Jumièges is a grim, old ruined Norman abbey which, seen by moonlight, awakens the same emotions as those claimed for the Coliseum and Melrose. Duclair is a market town and not much more. Caudebec, 15 kilometers further on, should be included in every Norman itinerary, particularly if the "mascaret" is on. The "mascaret" is a great incoming wall of water which rushes up the Seine at certain seasons of the year at an alarming rate. It is a veritable whirlpool and a sight worth coming miles to see, but it's all over in a minute.

Dieppe Has Many Attractions.

Dieppe and its attractions are known to all. At Puys, on the cliff just eastward of Dieppe, may be seen the house where Dumas père lived and died. At the easterly end is Eu and its now ruined château, and Tréport, the Parisian watering place—not fashionable, but the *vogue*, nevertheless.

Fécamp to the westward, but still 40 kilometers from Havre, has a history and an industry. The industry, or more correctly

the produce of the industry, is better known than the history; the "Benedictine Brewery," as a German contemptuously referred to it in one of those brief intervals when Germans travel in France, is one of the "sights" of the town, and a very interesting sight it is. You get a free drink besides. *Verb sap!*

Étretat and its *falaises* are known to all who remember or have ever seen the "Table Books of Art" of a half century ago. Étretat was the chief artists' sketching ground in France after Barbizon, in the days of Louis Philippe. Étretat's *vogue* has passed and the automobilist rushes in and out like a glance of



THE FINEST TOWN IN NORMANDY: PETIT ANDELYS.

the eye and goes to St. Jouin for déjeuner—if he knows his business. St. Jouin has got the real thing in the way of a hotel, the Hotel de Paris, "conducted," as one learns formally, by Madame Ernestine Aubourg. In the days of Dumas Père, when the inn was already famous, she was simply "La Belle Ernestine" and M. Aubourg had not then appeared on the scene. Dumas described "La Belle Ernestine" in 1865.

How One Crosses the Seine.

To pass the Seine one has to double back from Le Havre to Lillebonne, 35 kilometers, via Harfleur and Tancarville, keeping always by the river road and not going by the island route via Bolbac, as most do. One crosses the Seine by an antediluvian *bac à vapeur* from Lillebonne to Quillebeuf, at a cost of from one to two francs, "according to the force of the motor." From Quillebeuf via a by-road one arrives, in a dozen kilometers, at Pont Audemer, an unconvincing, small, smug town of Normandy, whose principal "affaires" are those of the litigation courts.

It is a main road from Pont Audemer to Trouville, 38 kilometers via Honfleur, one of the most delightfully quaint old Norman seacoast towns existing. Trouville is the gayest, most sporty, of all the northern French *plages*. Honfleur is its antithesis. There is an admirable *corniche* route from Honfleur to Trouville, 14 kilometers along the edge of the cliff, a reminder of the Mediterranean *corniches*.

Trouville—*un petit Paris au bord de la Mer*. You get anything you like here, and are willing to pay for, at the three-starred Hotel des Roches Noires or the Hotel de Paris. Lunch at either, if you will, on a terrace overlooking the sea, and stroll about the promenades after, but dine and sleep at Pont l'Eveque, 10 kilometers inland, and see what a real French country hotel is like. Pont l'Eveque is as prominent a center for the cheese and butter trade as one finds in Normandy, and there will be a supreme satisfaction in seeing the untrammelled life of the people as contrasted with the affectations of Trouville-Deauville.

If the above proposition is not wholly agreeable, and you are going to make the Norman round as quickly as possible, you make your stopping place for the night at the Hostellerie Guillaume le Conquerant, at Dives-sur-Mer, 20 kilometers west of Trouville. The hotel is a curiosity—a musée, if you will—such as you will not find in all France. It is got up for show and is nothing indeed but a "sight," though the fare is good and the price is low, not over nine francs a day. It was from the port of Dives that William the Conqueror set sail in 1066 to revolutionize the manner of life in England—and he did it.

Mont St. Michel is the end of every Breton and Norman pilgrimage. It really belongs to Normandy, though practically it is on the boundary between the two ancient provinces. It's delightful to pass the night on the water-surrounded isle, to wake with the sun and imagine what it must once have been when the

CHAMBRE N°

Prix { P^r 1 personne...
{ P^r 2 personnes...
(Service et éclairage compris)

REPAS

Petit déjeuner (dans l'appartement)...
(dans la salle à manger)...
Déjeuner à la fourchette (14.)
Dîner (14.)

DIVERS

Pompe d'un domestique (par semaine)...
Chauffage { Panier de bois...
{ Sceau de charbon...
Bain de pieds...
— de siège...
Grand bain...
Omnibus (pour la gare, par semaine)...

M.M. les Voyageurs sont priés de vouloir bien déposer leurs valises au bureau de l'hôtel.

"WHAT YOU HAVE TO PAY."

monks of the old abbey were in "peril of the sea," but the automobilist finds scant accommodation here.

The distance from Coutances to Mont St. Michel, via Granville and Avranches, is 87 kilometers. From Mont St. Michel to Mortain, 48 kilometers, or to Domfront 74. Three to five days have been spent en route up to now. One might as well thread the highways as well as the byways, and spend a month in Normandy, but most automobilists will not see it that way.

Back to Paris Through Touraine.

The itinerary can well be combined with that of Brittany by keeping on westward from Mont St. Michel and so on back to Paris through the châteaux country of Touraine, but if one turns Parisward again at Mont St. Michel he will want to spend at least two days more en route.

Argentan, Alençon and Mortagne (not Mortain this time) should be visited and *déjeuner* taken at the monastery of La Trappe, near Mortagne. If it's a stag party, one may dine simply in the refectory of the monastery itself, leaving the automobile outside in charge of a brown-robed, gray-bearded brother, whose usual occupation is minding his *très belles vaches*, or watching the bees going and coming from their hives—cheese and honey are the two great specialties of La Trappe-Soligny.

The route from Argentan or Mortagne to Paris via Laigle, Verneuil and Dreux is approximately 156 kilometers, an easy day's run, allowing a stop for lunch at Dreux (Hotel de France).

This return itinerary through Normandy comprises quite a different topographic ensemble from that out by the Seine Valley and the coast road. The soil is more rolling and, taken all in all, is a hilly stretch; nothing hard, and the surfaces always well kept, but with a typical French countryside character to it.

One might vary the return from Mortagne by entering Paris via Chartres, Maintenon and Rambouillet. Chartres and its cathedral, its excellent "commercial" hotel, the Duc de Chartres, and its altogether delightful surroundings should be omitted from no automobile itinerary which comprehends Normandy, Brittany or Touraine. It can be readily combined with each.

In the Country of the Vine.

It is 18 kilometers from Chartres to Maintenon—and here, by the way, one is in the *pays du vin*; wine takes the place of cider at table d'hôte simply because it is a vine-growing country instead of an apple-growing one. Maintenon is a pompous little town of 1,400 inhabitants, and is marked in the French road books with a miniature locomotive, sealed letter and a telegraph pole, indicating that it is a railway station, a post-office and a telegraph office. One of these excellent French road books, the Guide-Michelin, goes so far as to give a miniature reproduction of a red cross flag, indicating that the badly injured may be properly taken care of, by local aid. Automobilists don't get so seriously injured in these days as they did at first, and they don't so often injure others, but all the same it's good information to give in a guide book, and in this respect the French lead the world—even the indefatigable Germans. Maintenon's interest for the traveler is in its associations of the widow Scarron, who, as the Marquise de Maintenon, married Louis XIV in 1684. Louis XV came along in turn and built a château for "La Pompadour" here, but it has disappeared to-day.

Maintenon to Rambouillet is 22 kilometers, and three kilometers of it through the town are as bad an example of *pavé* as one meets in a thousand kilometers of French travel. Here is the state château de Rambouillet. It was acquired for the crown by Louis XVI in 1665 and is still occupied for the hunting by the *bons bourgeois*, the presidents of the present republic.

The roads through the Forêt are excellent and a charming détour of a dozen kilometers can be made. Paris is entered in either case through Versailles, but if one is going north again within a reasonable time, or even down into the Fontainebleau region he can find admirable garage accommodation at Versailles and save a dozen or twenty miles of nerve-racking automobiling each way to and from the center of Paris.

Auto Organizations After the Hotels.

The Touring Club de France, and the Automobile Club de France are doing their utmost to brace up provincial hotels, and in Normandy the seed of their efforts is taking root. "*W. C.'s perfectionnés*" are springing up like mushrooms where a *lieux* only formerly existed. The sleeping rooms, too, are being refitted on the "*hygiénique*" plan here and there, and you know what you are paying for each separate thing from the posted notices.

The road signs, the " *poteaux indicateurs*," throughout Normandy are excellent and may be read whilst moving at a swift pace. This the automobilist will like, though the propriety may be doubtful. Coming out from Paris, and indeed on all the main roads, the signs are particularly legible. They give first the name of the Route Nationale, as—Paris-Le Havre—with the distance from Paris and the distance to Le Havre. Then the distance to the next nearest town in either direction. No elaborate formula or hieroglyphics to remember or forget. The road signs of France are a blessing.

Essence and *huile*, which is the Frenchman's way of naming gasoline and oil, are obtainable everywhere, the former selling for two francs to two francs fifty for five liters, something over a gallon; more expensive than in America, of course, but a small factor when touring. Each is obtainable everywhere.

Itinerary

Place.	Kilometers.	Hotel.
Paris	00	
St. Germain	19	
Mantes	40	
Rosny	6	
Rolleboise	3	
Bonnnières	4	
Vernon	7	
Pacy-sur-Eure	14	Hotel Lion d' Or.
Evreux	17	
Conches	18	Croix Blanche.
Gallion	14	
Giverny	4	Bodet.
Les Andelys	24	Bellevue.
Louviers	22	Mouton d'Argent.
Pont de l'Arch	11	Normandie.
Rouen	14	Lisleux, d'Angleterre.
Caudebec-en-Caux	35	du Havre.
..... via Duclair		du Soleil d'Or.
Dieppe	—	
Eu	—	Coquantin.
Treport	36	
Veules-les-Roses	—	
Fécamp	65	Grand Hotel Canchy.
Etretat	19	Hauville.
St. Jovin	—	Hotel de Paris.
Le Havre	23	Continental.
Harfleur	5	
Lillebonne	30	
Quillebeuf	14	Lion d'Or.
Pont Audemer	14	
Honfleur	34	
Trouville	14	Roches Nolres.
Pont l'Eveque	13	du Bras d'Or.
Dives	18	Hostellerie Guillaume le Con-
Caen	26	querant.
Bayeux	28	de la Place Royale.
St. Lo	36	de Luxembourg.
Coutances	36	de Normandie.
Granville	28	de la Gare.
Avranches	29	Grand Hotel du Nord.
Pontorson	25	Angleterre.
Mont St. Michel	22	de Bretagne.
Mortain	10	Poulard Alné.
Domfront	48	de la Croix Blanche.
Falaise	26	de la Poste.
Argentan	53	de Normandie.
Morcagne	22	des Trois Maries.
Dreux	58	du Grand Cerf.
Chartres	74	de France.
Maintenon	34	du Grand Monarque.
Rambouillet	18	
Paris via Versailles	22	de la Croix Blanche.
.....	50	

Guides and Maps.

Joannes "La Normandie," 7 fcs., 50 cents. Published by Hachette & Cie., Paris.

Carte Taride, Nos. 4, 5 and 8, 1 fc. each. Published by A. Taride, Paris.

Carte d'Etat Major, 1-80,000, 30 cents a sheet. (Sold everywhere.)

"Sur Route" Atlas-Gulde, 3 fcs., 50 cents. Published by Hachette et Cie., Paris.

"Rambles in Normandy," by Francis Milloun. Published by L. C. Page & Co., Boston.



A TYPICAL STRETCH OF AVERAGE COUNTRY ROAD NEAR WATERLOO, INDIANA—IT MUST HAVE BEEN WASH-DAY ON THIS FARM.

LAYING OUT THE ROUTE FOR THE BIG TOUR

By F. ED. SPOONER.

COLUMBUS, O., May 19.—Columbus is possible in a day's run from Indianapolis, and Indianapolis is possible in a day's run from South Bend. The two hardest portions of the trip of the "Pathfinders" in their great six-cylinder, 70-horse-power Pierce-Arrow car have been completed successfully, and, what is more, after hard storms, and the long journeys have been found not impossible.

The "Pathfinders" arrived in Columbus, Saturday night, after traveling 174.4 from Indianapolis, nearly 25 miles shorter than the estimated distance. This long journey was made after two days of hard rain, and yet the long, straight stretches of road from Indianapolis to Dayton, over the National Highway for a great part of the distance, and from Dayton to Columbus, were found possible. The road from Indianapolis is straight away, and cannot be lost. From Columbus to Springfield is again a long, straight stretch, and from Springfield to Columbus, another. The turn at Springfield and one at Dayton are the only ones to be made.

In good Summer weather, with the roads dry, this route will compare with any in the country, and from thirty to forty miles an hour as an average would be possible. The tourists

will not make this, as they are to have a pacemaker twenty minutes ahead, and the pacemaker will keep the pace at legal speed. Beyond him a contestant cannot go under any circumstances, for should he do so it will mean disqualification.

With the completion of the trip to Columbus the entire route of the Fourth Annual A. A. A. Tour becomes known. The cars numbering from 1 to 200, with from five to six hundred people, will leave Cleveland, July 10, and proceed over the well-known route through Elyria and Norwalk to Toledo, a distance of 121 miles. At Toledo, as at Cleveland, ample accommodations for man and machine will be found.

July 11 the trip will be from Toledo to South Bend, a distance of 166 miles, a long day's run, but one which will be made easily in good weather, and with, perhaps, a little difficulty in bad going. The big Pierce averaged easily twenty miles an hour with frequent stops for pictures and for information at each town and on the road.

From South Bend, July 12, and returning to South Bend, July 15, the trip is 101 miles each day. South Bend provides accommodations equal to any that can be found on Broadway or elsewhere in the country.



NEAR SOUTH AMHERST, O., BEFORE THE RAIN HAD CEASED.



NEVERTHELESS OHIO HAS SOME EXCELLENT ROADS.



THE FIRST NIGHT'S STOP WILL BE IN TOLEDO.

The journey of 147 1-2 miles from South Bend through Rochester, Kokomo, and Tipton to Indianapolis had caused some speculation, but this route provides roads absolutely ideal and very interesting. In fact, all Indiana roads are good, much to the surprise of the "Pathfinders," who compare them to New Jersey and Massachusetts roads.

Indianapolis secured a place on the route at the last moment,



ELMER APPERSON TAKING THE PATHFINDERS INTO KOKOMO.

and by invitation of the city officials and the newspapers, and is so delighted with the prospects of having the tourists that it will give them a welcome second to none on the route. The cars will be parked around the National Soldiers' Monument and will be under guard of the city police.

The Indianapolis met the tourists at Tipton and escorted them in. Edgar Apperson, of Kokomo, had met them at Roches-



IN INDIANA WHERE SHEEP RAISING IS PROFITABLE.

ter and taken them to Tipton, picking out an excellent but devious road, with some nineteen turns in a few miles. The Indiana Association of the A. A. A. will place signboards at every corner in the State, from the Illinois to the Ohio border.

A blind man could follow the route from Indianapolis to Columbus, for it is straight as a die from Indianapolis through to Dayton and again straight from Dayton to Springfield, and again from that city to Columbus.

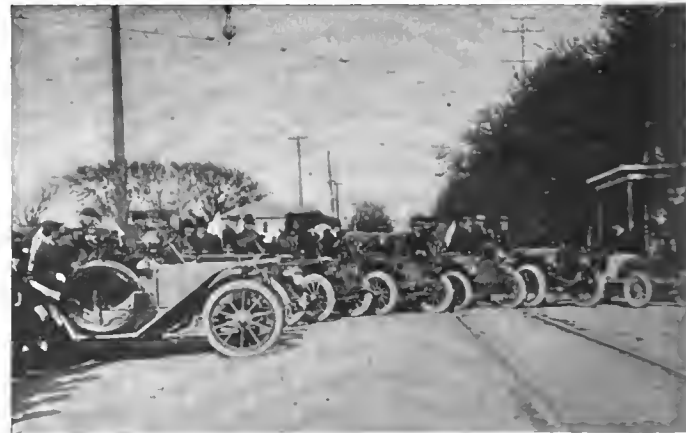
From Columbus the route will be eastward through Canton to Pittsburg, Bedford Springs (where Sunday will be spent), then Baltimore, Philadelphia, and New York. The entire route will be about 1,500 miles.



PATHFINDERS OF COLUMBUS AND PIERCE'S PATHFINDER.

The route from Chicago east by the route the "Pathfinders" are following is new to tourists, but ideal in every way. From Indianapolis to Dayton it may be changed somewhat to allow of a side trip to New Castle. Vice-President Fairbanks sent Messrs. Maxwell and Briscoe to the main line of the tour to ask the committee to make a detour of a few miles to pass through New Castle.

Thus far, and to the end, in all probability, the tourists have every facility for a good time. Good hotels everywhere promise



THE ESCORT OF THE PATHFINDERS INTO INDIANAPOLIS.

the finest accommodations, and agree in writing to keep the regular rates. Garage men promise gasoline and sign to supply it at regular rates. The roads are good all the way, and do not include tough going to any extent, and every point thus far honored by a place on the tour promises to treat the hundreds of tourists royally. Chairman F. B. Hower is a business man, and is arranging this tour on business lines, making sure of everything in writing, and taking nothing for granted.

The Pathfinding Pierce, with Dai H. Lewis, secretary of the Touring Board; Teddy Dey, driver, and F. Ed. Spooner, photographer, will continue its trip to Canton with a guide supplied by that city, to-morrow morning.



ARCHITECTURAL DESIGN FOR THE GATEWAYS.

WORK BEGUN ON PARKWAY

LONG pent-up curiosity on the part of hundreds of autoists and others interested in the Long Island Motor Parkway was finally satisfied last week when the announcement of more than half the route was made, and what was considerably more to the point—work was actually undertaken. There have been so many conflicting rumors and so many unfounded reports, particularly regarding the amount of right of way donated to the corporation that it did not come in the nature of a surprise to learn that the present western terminus of the Parkway will be Garden City instead of Floral Park, three or four miles nearer the city line, as at first given out. The Parkway will start from a point about midway between Garden City and Mineola, and will be entered from the road running almost due north and south that connects the two. From here its trend will be practically due east on a line parallel with the main line of the Long Island Railroad and a part of the Vanderbilt Cup course of 1904. For six or eight miles the land is a dead level, and there is no necessity for either a grade or a bend. After passing Hicksville, where the railroad divides for the north shore branch, the main line takes a southward trend, and the route of the Parkway does likewise to avoid it. The country continues flat throughout that portion of the route until the latter bends northward, diving under or going over the Long Island Railroad tracks between Farmingdale and Deerpark; just what it will do here and other places where there are obstructions to be avoided will depend upon the result of the surveys.

Once north of the railway line, the route strikes into what is known as the West Hills and Dix Hills section. Of course, Long Island cannot boast of anything very ambitious in the shape of a hill throughout its entire length and breadth, but this portion of the north shore extending from Cold Spring on the west to beyond Port Jefferson on the east is practically mountainous by comparison with the absolute flatness of the remainder of the island.

According to the government survey the hills vary from 200 to 300 feet above sea level, the latter being exceptions of course, and few of the roads reaching that altitude. Here, too, the Parkway will



A. R. PARDINGTON, VICE-PRESIDENT AND GENERAL MANAGER.

assume more diversity, not alone in the shape of scenery, but it will lose some of its arrow-like straightness, due both to the presence of the hills and hollows in question and to the necessity of discreetly going round the holdings of grouchy land-owners who would not give permission to go through. However, any curves will be long and easy.

Although but 35 to 40 miles from New York City, this part of the island is but thinly settled, and is about as wild as any part of Long Island can be. Cross-island roads are few and far between after leaving the pike that connects Northport on the Sound with Babylon on the south side, and which passes through Deerpark, and those that are encountered are usually in hollows so that they will have to be crossed on bridges, thus adding a bit of variety to the character of the road. For a number of miles the route will skirt the side of the ridge that forms what appears to be the backbone of the island, occasionally rising to a high part of it and affording a view of the ocean where trees do not intervene to cut it off. But the land again comes back to the same dead level that distinguishes its first stretch, a little

further along, and the speeder will get a view of not a little of that most characteristic type of Long Island vegetation, the scrub oak. The original formation of the island is also revealed in the miles of sea-sand and gravel, as the route approaches Lake Ronkonkoma, which is to be the terminus of the present stretch. This is a distance of 32 miles, almost in an air line, and it is expected that the gap between this point and Riverhead—a distance of 26 miles—will be ready for surveying long before construction is finished on the first portion. The work has been placed in charge of E. G. Williams, a Yale man, who has long been identified with railway construction both in this country and South Amer-



BEGINNING THE WORK OF SURVEYING THE ROUTE.



MAUD ADAMS' HOUSE NEAR LAKE RONKONKOMA.



A "WHITE" OBSERVER OF PICTURESQUE RONKONKOMA.

ica, and who is at present building the Washington tunnel. No decision has yet been reached as to the character of the material to be employed, but it is confidently expected that the Garden City-Lake Ronkonkoma end of the Parkway will be completed by November, though it may not be thrown open until the following spring.

POPE-TOLEDO BUILD VANDERBILT RACER.

Pope-Toledo will be again represented in the Vanderbilt Cup contest whenever that event is held. It appears that work has been progressing for some time on a special chrome nickel steel racer, all particulars regarding which are carefully withheld. It is declared that this is the most costly steel made, and that it is not only the strongest, but also the lightest and most flexible. In addition to the special racer, the Pope Motor Car Company will enter in the Vanderbilt race a type XV, 50-horsepower regular stock runabout. Herbert Lytle is reported to be the prospective driver of one of the machines.

DRAGON RACERS FOR VANDERBILT CUP.

The driver and constructor of the two racing cars being built by the Dragon Automobile Company for the Vanderbilt contest is L. Charles Kenen, a French designer of experience, who was for many years connected with prominent European factories, having been with Darracq, and for three years each with Clément and Brasier. Mr. Kenen has been at work for six months on the Dragon racers and is at present attending to the assembling of the engines, which he expects to complete about May 25. In the meantime the construction of frames and running gear for the racers is being pushed forward at the Philadelphia factory.

BRITISH AUTO RACE TRACK ALMOST READY.

LONDON, May 12.—A few weeks more and the world's first exclusive automobile race track will be thrown open for public displays of speed. July 16 has been fixed as the date of the first official meet at the Brooklands racing track near Weybridge, but the course will be open to the public for informal speed tests on June 15. At the present time the course is being treated with asphalt, and there is no reason whatever why it should not be quite ready for the date fixed. The course will be open every day for racing and private speed tests, and in addition there will be a number of interesting public competitions, the most important of which will be on July 16. A type of event which it is considered will be very popular is a race for cars of the same make and type. Thus there will be a race for 35-horsepower Daimlers, another for 30-horsepower White steamers, and another for 35-horsepower Mercedes. There will be special races for cars which have taken part in the important road races of the season, such as the French Grand Prix, the German Emperor's Cup, the Ardennes Circuit, etc. As an incentive to Continental manufacturers to send their machines over, the Brooklands committee will offer a prize of \$2,000 in connection with each of these races. Saturday, August 3, and Bank Holiday, August 5, will be important race days, while the event for the German Emperor's Cup racers will probably be on September 21. Handicaps and selling plates are being arranged for on much the same lines as in horse races. In fact, the general lines of conducting the Brooklands course will be those of the principal English horse-racing courses. A prize fund of \$75,000 has been set aside for the present season, a large proportion of which amount will be distributed on the opening day. The Brooklands track, built over the private property of Mr. Locke-King, is the first of its kind.



GENERAL VIEW OF BROOKLANDS AUTOMOBILE TRACK NEAR LONDON, SHOWING ONE OF THE BANKED CURVES FOR 100 MILE SPEEDS.

SOME FEATURES OF AUTOMOBILE CONSTRUCTION*

By THOS. J. FAY, E.E.

IN attempting to elaborate upon features of construction of automobiles, the dominant idea will be, to more or less discriminate as between (a) things tried out and found wanting; (b) things tried out and found satisfactory; (c) things in the air, so to speak.

It is believed, a society of engineers, to serve a useful end, should serve as a "clearing house" for engineering practices, rather with the expectation of ultimately fixing upon standards to go by. It is not the purpose here to advocate any scheme likely to limit the zone of activity of inventors, or place anyone in the position of having to conform to narrow conventions. On the other hand, it is feasible to aid invention and broaden the range of vision, by limiting the amount of details to be mastered, as well as decreasing the repetition of errors, costing as they do, *lives and money*.

It is not to be expected of any one to disclose advanced ideas of construction, yet, even so, a thing becomes free for discussion the very instant letters patent are granted, or the thing is placed on public view, and by discussion or the comparison of notes, the status of a device becomes, to a greater extent, a known quantity, when discussed by skilled engineers in a friendly way.

The speaker labors under the impression, borne of some experience, that it is to his advantage to have devices he may contemplate using or may have in actual use condemned for their faults rather than to be lauded for the advantages they may not possess at all, for in all truth an engineer, who follows up his errors, sticking to a narrow minded path of error, does damage to other engineers who may not be in a position to know of the fallacies; and to the public, who support an industry, the wrong is a double one, since the public may feel inclined to assume competence where incompetence may be the sole asset.

Engineers, then, may be frank with each other, for their mutual benefit and advantage, but they should be a little charitable in their criticisms, if for no other reason, because "glass houses cover a multitude."

Mistakes are only the products of activity, which, to illustrate, the speaker will cite an instance of a pattern maker he found in an establishment on an occasion, where the speaker assumed supervision.

The pattern maker in question was making a never-ending job of a bracket, of simple shape, and to hasten matters a little, the pattern maker was advised of the need of getting through some day.

Mr. Pattern Maker looked hurt, and by way of explanation he pointed out that he had never made a wrong pattern and he was at it for nearly thirty years; but the same pattern maker failed to explain that he had never finished a pattern, which was the true secret of his immunity from errors.

Engineers that do things do them right, if they know how, but they do them in any case, hence an engineer is a man that does right some times. If, then, engineers will confer a little, they will cease to be engineers at all, for as a result of comparison and discussion, they may succeed in always doing right.

Engineers are oftentimes placed in the position of having to do things that do not look right to them, simply because Mr. Commercial Man says "that is what we want." Mr. Commercial Man may not be amenable to argument, or may feel called upon to expose his dignity; but the consensus of opinion of a body of engineers would suffice to quell an earthquake, not alone to merely save the life of Mr. Commercial Man, who might otherwise allow his dignity to be exposed long enough to catch his death of cold.

Of the many points of construction in need of light and "more light," but few of them can be taken up at any one time, nor can any one man take time to become perfectly familiar with but a small part of the whole.

Since the last meeting of this society the speaker was afforded an opportunity to experiment at some length and more expense on the question of the means by which "alloy steel" may be machined and otherwise fashioned into shapes as required in motor cars, and if signs do not fail, the speaker labors under the impression he is not alone in the struggle.

It is one thing to say chrome nickel steel, for illustration, makes good metal for, say, axles, but it is another matter to say chrome nickel steel makes good axles. The best metal for axles is the best metal of which axles *can be made*, when it comes to facts, and chrome nickel steel does not grow soft in forging. To cope with this question, with a view to being able to say that commercially, important parts of motor cars could, as they should, be of nickel-chrome or other suitable alloy steel, the speaker has taken up the questions as follows:

- (a) The desired characteristics of the steel.
- (b) The desired shapes of the parts in which the steel may go.
- (c) The machine tools required in the process.

In the new "Ellsworth" car the results of these investigations will ultimately be found, and briefly the conclusions reached may be set down as follows:

Chrome nickel steel, for motor car parts of responsibility, in which parts must be forged before machining, the steel must be particularly low in phosphorus and sulphur, and the relation of carbon to both nickel and chromium must be closely regulated. Manganese must not be interjected to doctor the steel in the absence of carbon, and silicon must be held at a uniform low value.

Strange to relate, it does not matter who makes the steel, if it is of the requisite qualities; but all steel made will not suffice for the purpose; in other words, a nice appearing representative of a steel firm will not in anyway make unruly chrome nickel steel amenable to conditions adverse to its composition.

Moreover, this product seems to have widely varying characteristics for slightly varying components, and it is also suspected that even the chemical composition is not all to be taken into account.

In other words, the raw products, of which the steel may be composed, must, in some small measure at least, influence the workability of the steel.

As regards the desired chemical composition of chrome nickel steel it may be it can at first be discussed in the abstract, with a view to limiting the components, and thereafter fix the relations of the components to one another.

Taking this view of it, the question of phosphorus is of the first moment and might be settled as follows:

PHOSPHORUS RATINGS

0.010 to 0.012	}	The range of phosphorus in the finest product capable of being forged and heat-treated
0.012 to 0.015		
0.015 to 0.020	}	Low enough to be amenable to heat-treatment, forgeable, but lower in price than then the first named product
0.020 to 0.025		
0.025 to 0.030	}	Low enough in phosphorus to be used without forging or heat treatment, but too high to consider in the finest grades of cars.
0.030 to 0.035		
0.035 to 0.040	}	Limited to use in parts not likely to sustain severe shock loads, but not suitable for forgings.
0.040 to 0.045		
0.045 to 0.050	}	Very questionable product—probably not as good as ordinary nickel steel.
0.050 to 0.055		

*Paper read before the Society of Automobile Engineers.

The price of chrome nickel steel, while it is regulated by the "tariff," should be regulated by its phosphorus component first, and its sulphur component second, as follows:

SULPHUR RATINGS

0.010 to 0.015	} Very low value to be found in chrome nickel steel, of an especially forgeable quality.
0.015 to 0.028	
0.025 to 0.035	} Limits of sulphur in chrome nickel steel of a fine quality for forging, if the phosphorus is under 0.015.
0.035 to 0.045	
0.025 to 0.035	} Range of sulphur in inferior chrome nickel steel, showing phosphorus between 0.015 and 0.025 not suitable for forging or heat treatment.
0.035 to 0.045	
0.035 to 0.045	} Inferior product probably not equal in any way to good nickel steel, for less cost.

Manganese in chrome nickel steel should range about as follows:

MANGANESE RATINGS

0.35 to 0.45	} For steel holding about 30 points of carbon, 1½% chromium, and 3.30% of nickel.
0.45 to 0.65	
0.65 to 0.75	} For steel holding about 25 points of carbon, 1½% of chromium and 4½% of nickel.

Silicon seems to run about 0.20 per cent. for all the good grades of chrome nickel steel. It was found to be a little lower in some inferior product, and even a little higher in some good product; it would seem, then, as if the silicon rating should be fixed about as follows:

[SILICON] RATING

0.18 to 0.28	} For chrome nickel steel low in sulphur and phosphorus, with manganese about 0.40 and carbon about 0.30.
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The question of carbon is one not to be treated in the abstract at all, since carbon relates to nickel and chromium. Any procedure, then, involving the one must take into account the remaining two components. Having stated the abstract limitations, the best way to proceed, perhaps, will be to set down the formula of steel products and state results.

Chrome Nickel Steel—"A."

CHEMICAL COMPOSITION

<i>Chromium</i>	<i>Nickel</i>	<i>Carbon</i>	<i>Silicon</i>	<i>Sulphur</i>	<i>Phosphorus</i>	<i>Manganese</i>
1.40	3.30	0.28	0.20	0.015	0.012	0.40
to	to	to	to	to	to	to
1.50	3.40	0.33	0.25	0.020	0.015	0.45

Of copper and arsenic, a trace at most.

PHYSICAL PROPERTIES—NORMAL

<i>T. S.</i>	<i>E. L.</i>	<i>Ex-2"</i>	<i>Con. ½"</i>	<i>Structure</i>
120,000	100,000	24	67	
to	to	to	to	} Close
110,000	95,000	16	62	

QUENCHED AND ANNEALED

150,000	130,000	28	71	} Very close
to	to	to	to	
130,000	115,000	18	62	

CASE-HARDENED

235,000	225,000	8	44	} Close core, thick armor
to	to	to	to	
220,000	215,000	6	38	

Relative shock ability as compared with 30 carbon steel as 100 below N. C.

1	2	3	4	5
190	176	121	150	140

counting only the point at which both products bend until the test can no longer be continued.

After this test the chrome nickel steel may be bent double on itself, whereas the carbon steel would snap upon further bending, to any great extent.

This product is forgeable, and is rendered soft enough to machine by annealing to 630 degrees C. Forging should commence at between 1,000 degrees and 1,050 degrees C.—near the latter—and should be a continuous process down to 700 degrees C. to

about the formation of large crystals. Before forging the pieces should be raised slowly and through to 900 degrees C. and allowed to "soak" for a time. Prior to forging, each piece should be raised the remaining difference, and forthwith start the forging process.

The oil tempering process can be to 800 degrees C., with subsequent annealing to 550 degrees C., or to 1,000 degrees C. and subsequent annealing to 550 degrees C.

For gears to be oil hardened they can be raised to 1,000 degrees C., quenched in cold water, then in oil, and subsequently reheated to 335 degrees C. and cooled in the open. Gears thus treated will be both tough and hard.

Still another product, but somewhat higher in price, may be set down as follows:

Nickel Chrome Steel—"B."

CHEMICAL COMPOSITION

<i>Chromium</i>	<i>Nickel</i>	<i>Carbon</i>	<i>Silicon</i>	<i>Sulphur</i>	<i>Phosphorus</i>	<i>Manganese</i>
1.50	4.40	0.22	0.21	0.012	0.012	0.65
to	to	to	to	to	to	to
1.60	4.50	0.28	0.25	0.015	0.015	0.75

PHYSICAL PROPERTIES—NORMAL

<i>T. S.</i>	<i>E. L.</i>	<i>Ex-2"</i>	<i>Con. ½"</i>	<i>Structure</i>
122,000	112,000	28	69	
to	to	to	to	} Close
114,000	100,000	22	64	

OIL-TEMPERED AND ANNEALED

155,000	138,000	18	35	} Very close
to	to	to	to	
145,000	130,000	12	25	

The speaker has not tried this product "case-hardened," but he has seen case-hardened specimens and they looked to be thoroughly good in every way.

The especial value of this steel lies in its forgeability; it can be hammered out from a cube to a thin disc and show no signs of cracks, or it may be forged and expanded into weldless rings, one of which the speaker saw being two inches thick, with a bore or hole fully 18 inches in diameter. The normal physical properties are scarcely different from the physical properties of some very inferior product; yet even so, under the hammer or in heat treatment this product is vastly superior. To illustrate this point, an inferior product will be set down as follows:

Chrome Nickel Steel—"C."

CHEMICAL COMPOSITION

<i>Chromium</i>	<i>Nickel</i>	<i>Carbon</i>	<i>Silicon</i>	<i>Sulphur</i>	<i>Phosphorus</i>	<i>Manganese</i>
1.90	3.31	0.227	0.15	0.033	0.030	0.34

PHYSICAL PROPERTIES—NORMAL

<i>T. S.</i>	<i>E. L.</i>	<i>Ex-8"</i>	<i>Con.</i>	<i>Structure</i>
162,000	107,000	7.5	19	Open

This product is obviously not a fit product for use in any shape in a motor car; but upon forging, it exhibited almost no elongation in the expanding ring test; yet even so, the chemical composition would be considered good as ordinary steel is rated, and the high-sounding tensile strength would cause an increase in the respiration of a novice. There is a lot of this stuff to be had on the market, the price of which is high enough to give it the ring of quality; nevertheless, "beauty is as beauty does."

(To be continued.)

Some Common Defects.—We have recently pointed out certain forms of construction—notably in connection with the attachment of springs—which are as bad as they are common, and we therefore need not refer to them again, except to say that one may see even worse designs, which have been evolved by ignorance combined with the desire for originality, says *Engineering*. Another feature in which many makers show thoughtlessness is in the arrangement of the steering gear. In nearly half the cars the coupling rod is placed in front of the axle instead of behind, where it certainly should be.

CONCERNING THE USE OF THE DRY CELL

By ARTHUR F. JACKSON.

EVERY dry cell that will register between fifteen and twenty-five amperes on a reliable ammeter is capable of furnishing satisfactory ignition service, and if such is not obtained it is through no fault of the cell. No dry cell dies out without a cause—external conditions—which it does not control and for which it should not be blamed. An ignition battery of dry cells is as reliable as a safety valve to a steam boiler, and if users will be guided by its action they will be well on the road toward a solution of ignition trouble. Dry cells, when intelligently and properly used, furnish the best ignition. Superior to storage batteries, wet batteries, or magnetos, and the cheapest, cleanest and safest.

These are startling assertions, I appreciate, but nevertheless are demonstrable facts and I trust they will lead to a thorough investigation by competent persons, intelligent, with good "horse-sense" (not experts) and capable of putting aside prejudice. I have handled thousands of dry cells during the past two years, have made numerous severe tests along various lines, have been in close touch with manufacturers, have investigated a multitude of complaints, and have had the benefit of the experience of one of the most expert manufacturers in the business, who has devoted the past fifteen years to this specialty; so my statements are neither hasty nor immature. I have never had a complaint which, upon investigation, failed to show conclusively that the fault was not with the dry cell. During this time I have never had a cell or battery of cells which acted inconsistently, nor have I had one to depreciate quickly without external cause.

The reason for the unsatisfactory results generally obtained from ignition batteries of dry cells is *improper* use. There should be as much intelligence in the use of dry cells as given to the other details of the engine. It is generally the contrary. I will gladly contribute toward the necessary expense to carry on exhaustive *practical* tests of dry cells and of comparative tests with storage batteries and other sources of electricity for ignition if others will join.

Why the Dry Cell Gives Out Quickly.

An illustration of the conditions of use almost universally prevailing and the reason for poor service obtained from dry batteries is to be found in a complaint I attended to recently. John Smith, who is an intelligent young man, has a small repair shop for automobiles. He complained that he only obtained some fifty miles from a fresh battery of dry cells in his own car. Investigation showed that he had a high-grade coil, which he recently paid \$80 for. Tested current consumption of coil. Found one unit taking in excess of four amperes rate of current and the other three units taking between two and four amperes. Also, one vibrator frequently *stuck* to the point and caused a dead short circuit. Impossible to adjust coils to proper rate of current. This condition is absolutely improper and unnecessary, for good coils—and this make is of highest grade—only require from 1-4 to 3-4 ampere rate of current for perfect ignition. This coil had been injured and possibly ruined by abuse without anyone being the wiser.

Another point which is not understood is the matter of voltage and amperage. Many are under the impression that excess of voltage is injurious to coils, but that any ampere rate of current may be used without harm. This is exactly contrary to facts. A few volts more than absolutely necessary will not injure the most sensitive coil, but an excessive rate of current—regardless of its pressure or voltage—will cause arcs at the vibrator points, quickly causing a pitting of the platinum points and the points of the plug and create other harmful conditions in the various parts of the ignition system. And this excess current is gen-

erally caused by insufficient voltage at the primary terminals.

Dry cells have a peculiar ability to offset inadequate voltage by increased current, although it quickly exhausts them. Many users are under the impression that because a dry cell registers 1 1-2 volts by meter test when fresh and unused they should use four-cell batteries for six-volt coils. This meter measurement is the inactive pressure. It is the initial voltage and a false voltage. The voltage or pressure of the service current of dry cells is between one volt and 1 1-4 volts, consequently not less than five-cell batteries and preferably six-cell batteries should be used with six-volt coils. A six-volt coil will have to be adjusted to a high rate of current when fed with a four-cell battery. The same coil will furnish perfect service with a current of 1-4 ampere when fed with a six-cell battery and not require further adjustment—it will not arc at vibrator points and will not suffer an internal short circuit. In fact, will be under proper conditions, and the ignition will be fast, hot and satisfactory.

Another condition which prevails is the misrating of coils. There are some jump-spark coils on the market and largely sold—represented as "six-volt" coils—which require 10-volt to 12-volt batteries to properly feed them. It results in users connecting them with insufficient batteries and obtaining not only poor service, but very short service from each battery. The fact that a coil may be "sparked" with a certain number of cells of battery is not an indication that that is the proper size of battery to use. You may "spark" a primary coil with a single cell, but the amount of service which a cell would furnish might be but a few minutes. It is the same with jump spark coils. A battery of three or four cells will spark them, but that does not indicate the proper size battery to use. The proper size battery is that one which experiments show to furnish the maximum amount of service and best quality of service with minimum deterioration.

Other Parts of System Also to Blame.

The timers, too, are responsible for a large amount of ignition trouble. It is a mistake and a misunderstanding of their true purpose for manufacturers to disregard battery consumption when designing this apparatus. A timer which is built with the sole purpose of long continued term of spark service ignores another condition, just as important, which it should control—battery service. Such a timer provides but a trifling interruption of the current, and at the high speed of automobile engines the current is so nearly continuous as to amount to closed-circuit conditions and cannot be met by dry cells. This disregard of current interruption is entirely unnecessary, for there are many timers which are perfectly satisfactory in service and which have such an interval between points of contact as to make a definite interruption of the current.

The matter of the grounding of the battery should have more intelligent treatment. It is not sufficient to ground on any metal part of the frame or engine. The further from the point of action and the more indirect the course, the greater the current waste and the slower action will be obtained. The primary current is very feeble and it is ridiculous to make it search for a way and overcome such obstacles as rust and metals of different conductivity to reach the point of action. Ground your primary wire close to the plugs or where the conducting medium is direct and of high conductivity.

Keep batteries absolutely dry. Protect them from any metals coming in contact with them. Avoid frequent ammeter testing. Make the interbattery connections only with such connectors as *cannot* extend beyond the rim of the knurled nut. If batteries are quickly exhausted or run down between periods of use search for the trouble in your ignition system and correct it. Dry cell batteries do not do this without cause.

MINOR PROBLEMS OF THE AUTO CAB

By W. F. BRADLEY.

WITH the advent of the automobile cab and the automobile omnibus new problems present themselves. Although a more costly and a more important unit, the ponderous 40-horsepower, 50-passenger omnibus such as is in use in large European cities, is an easier machine to construct and a simpler one to keep in operation than the modest 10-horsepower cab, which has become a necessity to Parisians and Londoners and will soon take out its naturalization papers in New York and other American cities. While 'buses are being constructed in hundreds, cabs are being turned out in thousands. Greater care can—indeed must—be selected in the choice of drivers for the heavy brigade, and their fixed itinerary allows them to receive attention from skilled mechanics in a manner altogether impossible with the small freelances.

At least half a dozen European constructors have designed and produced special cab chassis which may be described for want of a better word as absolutely fool-proof. Given two pupils equally ignorant of driving and caring for an automobile and a hippomobile, and the one with the modern auto cab would certainly become a safer individual to turn loose on the crowded streets of a big city than the latter in a given space of time.

But the auto cab driver is no more self-evolved than is any other type of genius. He has to be made by outside agencies, and the outside agencies for his making are not to hand. Paris has discovered this to be true. The first three hundred cabs to be put in operation were commanded by a superior set of men, young men who had the foresight to discover a future in the automobile cab, who studied the automobile or left positions in the mechanics' shop for a freer life in the open air. They were competitors and as such had to be efficient to succeed. But Paris has a fleet of 10,000 cabs in constant service and it is not to be expected, nor is it desirable, that when these are cast aside, as they will be within two or three years, that the veteran horse drivers should be abandoned also. Training them, however, to handle even a simplified Renault, Darracq or Bayard-Clément, automatic in almost everything but changing of gears, braking and steering, is an elaborate procedure. A score of stories could be told of the stupidity and gross ignorance of the horse cab driver who has abandoned the reins and the whip to sit behind a steering wheel. Some of them would be comical if they were not utterly stupid. A well-known automobilist relates how one evening he jumped into a Renault cab and told the driver to take him as quickly as possible to a street high up on the Montmartre hill. In the Rue Lepic, with its 10 per cent. grade that the horse drivers refuse to negotiate with a load, the little Renault stopped dead and began to run backwards until the driver had the sense to apply his brakes.

Turned round to his passenger, the undergraduate-chauffeur said: "Can't get up there; it's too steep."

In an instant the passenger was out, cast a rapid look over the machine and said: "Why, you are driving on second; if you can't get up on second, use your first."

"Oh, they told me to put the lever in that notch there, that's all I know about it," said the ex-horseman.

"Let me try; you see I have my license; it is for the same make of machine, and as I have often climbed this hill with a heavy closed car, I don't see why this light machine should not do it."

In a second the engine was cranked, the machine started easily on first speed and reached the top on second gear. The journey over, the passenger thought a little gratuitous instruction would not be amiss. Raising the hood, he said: "How many cylinders has your motor?"

"I don't know," was the reply.

"Well, there are two; see, one, two," touching them.

"Oh, yes, there are two," said the driver, complacently. Had he been told that there were six, he probably would have assented just as readily.

Government regulations require that every driver of an automobile shall have a thorough knowledge of the mechanism of his machine. Sometimes the inspector is conscientious and, after assuring himself that the candidate can steer round a block without shaving the mud off the market wagons, will order the hood to be removed and will pose a few questions. The proprietor of an automobile school whose pupil was refused owing to inability to lay his hand on the carbureter without hesitation, was indignant against the authorities and asked with rising wrath, "How much do they expect us to teach them for ten dollars?"

It has been suggested that a special operating license should be granted for automobile cab drivers, comprising merely an ability to steer a car, and supposing no mechanical knowledge. Such a plan would doubtless be prolific of incidents similar to the one which recently came to our notice, when a driver telephoned to headquarters that his machine was broken down, lodged himself comfortably inside the cab and waited an hour until an expert arrived on an emergency repair van to replace a detached wire.

There is no alternative for operating companies. Although it may call for the expenditure of a large sum of money, they must be prepared to train the existing raw material as promoters of other new enterprises have had to do. When the gasoline cab comes to this country it will go through the same ordeal as the Paris vehicles are now enduring. The initial vehicles will be handled by men already versed in automobilism, the mass of them will have to be turned over to men only familiar with four-legged power. On the pains taken to convert this raw material will depend, to a certain extent, the success or otherwise of the poor man's automobile.

AUTOMOBILE TRAINS FOR BARBIZON.

PARIS, May 13.—Every visitor to France has made a pilgrimage to Barbizon, rendered immortal as the home of Millet and the hallowed ground on which was painted *L'Angélus*. Had not the famous painter discovered the village it never would have been known except as one of the many picturesque and peaceful retreats on the edge of the Forest of Fontainebleau. The wincey diminutive locomotive which for a number of years has united the village with Melun, the nearest town, and carried thousands of pilgrims from all lands to the historic shrine, will no longer share the road with automobiles, cyclists and market carts. It has been replaced by a more modern means of transport in the shape of a Decauville automobile on rails. The motive power of the train is a 16-horsepower, four-cylinder Decauville gasoline engine mounted on an open car similar in general appearance to the summer surface cars of New York. A load of thirty passengers can be carried at a speed of twenty miles an hour on the level, and the engine is sufficiently powerful to climb the 10 per cent. grades met with on the road. Not only will there be a considerable saving in time, but a more economical service will be obtained by the conversion to gasoline.

A repair wagon driven by a four-cylinder gasoline engine has been adopted for use on the Paris Metropolitan underground railroad. The gasoline motor has been proved after experiments to give the best results for this class of work. The wagon is intended for use only when the electric current has been cut off in order that the breakdown gangs may work on the track with greater security. In addition it will be used as an inspection car during the hours when the ordinary service is suspended, electric trains not running between one and five in the morning.

DEVICES FOR BEATING THE FUEL RULES

NOT only the Grand Prix, but other smaller French races are to be run this year on a limited fuel allowance. To preclude the possibility of fraud the club committee stipulates that filter, stopcocks, carbureter intake and tank fillers must be sealed according to their instructions; an illustration of these methods was shown in the issue of THE AUTOMOBILE for March 28. If the driver can cheat the regulations and give to his engine more gasoline than the committee placed in the tank, his horsepower can be increased and his chances of winning thereby enhanced.

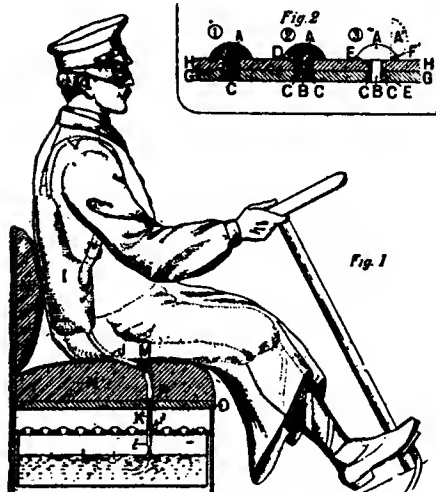


FIG. 1.—First prize winner, device for adding gasoline to gravity feed tank.

We reproduce the three winning systems, and give a résumé of the manner in which their designers intend them to be used. First prize winner says that although the method of sealing the fuel apparatus is not perfect, it is advisable to leave the seals severely alone and get an extra supply of gasoline, as shown in the sketch. There is no stipulation as to the position of the fuel tank; thus he would place it under the seat. The driver would carry concealed under his clothes, and held in position by braces, an india-rubber bag containing four or five gallons of gasoline, a rubber tube with a stopcock being attached to the bag.

One of the rivets in the top of the tank is specially prepared to lift out or to hinge open, leaving a hole in the tank through which the rubber tube can be passed. Between the top of the tank *L* and the frame *O* is a certain space filled with cotton waste or tools. During the race the driver stops, fumbles about under the seat as if to find a tool, but in reality pushes the end of the tube through the hole into the tank. By leaning against the back of the seat pressure can be exerted on the tank and the gasoline forced out.

Fig. 2 supposes that the tank is under pressure. Generally in such a case the oil is under pressure also, contained in a cylindrical tank within the chassis. In nearly every case the tank is supplied with a cock to relieve the pressure when it is desired to fill. In order to cheat the regulations this tap, instead of

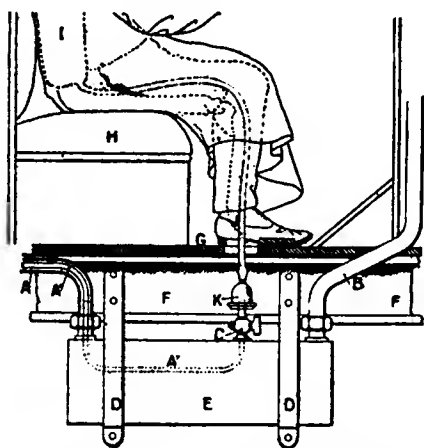


FIG. 2.—Second prize, device for adding gasoline to tank under pressure.

communicating simply with the interior of the tank, is connected with the air inlet. As this pipe is branched on to the air pipe leading to the gasoline tank, nothing is more simple than to send a supply of gasoline where it is needed. The manner in which it is carried is practically the same as that described for No. 1, and will be readily understood by reference to sketch.

Fig. 3 prefers to operate with a tank under pressure. Generally this arrangement comprises an air pump, and it is this which furnishes all that is necessary to cheat the regulations. If this pump can be made to pump gasoline instead of air, it is evident that it will fill the official tank without anyone being aware of its villainous rôle. The accompanying sketch shows how this is done, and it is hardly necessary to enter into details. A rubber tube connects the pump with the illegal tank, which in this case would be a tire carried at the rear of the car. During the race the machine would stop at the tire station, take on board a batch of tires, one of which would contain gasoline instead of air. While the car is running the mechanic would make the connection and on quiet stretches of the road would send a quantity of gasoline through to the official tank. If the pump were fitted with a spring the mechanic could operate it with his foot with still less fear of detection. By this arrangement the driver could take a fresh supply of gasoline at each round if he desired and thus beat all fuel consumption records.

Probably the chief value of the "frauding competition" will be that it will render fraud even more difficult, for, having had revealed to them one hundred methods by which their regulations might be brought to naught, the committee will be on the watch to see that none of them are put into practice. In the Grand Prix, run on a guarded course under the eyes of thousands of spectators and carefully watched by numerous officials, even the most ingenious of the frauding practices would be put into operation with great difficulty. In touring competitions they might be successful.

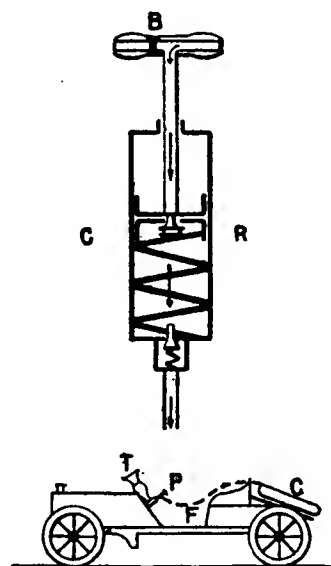


FIG. 3.—Third prize, arrangement for using pressure pump to obtain additional supply of fuel.

POPULAR FETES TO PRECEDE GRAND PRIX.]

PARIS, May 16.—As a prelude to the Grand Prix, to be run on the Dieppe course on Monday, July 2, there will be a series of motor boat races off the town of Dieppe on the Sunday of June 1. A triangular course, about three miles round, will be marked off, sufficiently near the shore for the races to be followed constantly by spectators, and the start will be arranged so that the contest will finish about 3:30 in the afternoon on account of the tide. Details of the boat races have not yet been discussed, but owing to the location of the town, three hours by rail from Paris and five hours from London, a huge attendance is counted on. During July and August Dieppe is the seaside resort most visited by holiday makers, English people being almost as numerous as the native French, for although the Britain is no lover of the Continental Sabbath on his own shores, he is particularly happy to have the opportunity of running across the Channel for a week-end relaxation. A prize list of \$4,000 is already assured. The fastest French, Italian and British boats will compete.

REMEDIES FOR ROADSIDE PERPLEXITIES

By THE MAN AT THE WHEEL.

NOT long ago I came across one of those owner-drivers whose skill at the wheel is second to none, but whose knowledge of things automobile does not extend a great way beyond this essential. He is one of that numerous class that looks upon the magneto with reverence akin to awe; it's all right as long as it continues to perform its duty, but when it goes wrong he's all at sea and simply doesn't know where to begin to open it up to get at the *works* when anything goes amiss. This was the case when I saw him last, for his car was at the side of the road, and he had a puzzled air of helplessness that would have appealed to a rapacious constable. His very expression seemed to say "Won't somebody kindly help me out of this?"

He explained things in a few words; his car was fitted with a duplicate system of ignition throughout, but the accumulators, being in need of recharging, had been left behind in the garage on charge, particularly as he was only out for an afternoon's run and had not intended to go very far. And he had not got as far as he had intended before the motor began to miss and finally stopped. Naturally he blamed the magneto, and sure enough the magneto was at fault. It had run all last season—in fact, ever since the car had been put in commission, and during that time a great many miles had been covered without so much as a look at the machine. It was a well-known make of the high-tension type, and he felt considerably relieved to see me remove the shield that covers the contact maker. A little oil and a little dirt in the wrong place, but chiefly a contact spring that had lost much of its youthful powers was the sole difficulty, and it did not take five minutes tinkering altogether to put things right again.

Increasing Fuel Consumption with Age.

Why should a motor use more gasoline as it grows older? is a question that crops up every now and again, and one that I heard brought to the fore by an autoist quite recently. "I always managed to average a good 18 to 20 miles a gallon on give-and-take roads around this district, and that means more or less hill-climbing all the time, but now I don't seem to be getting much more than 15 or 16, and sometimes not as good as that," he said, in explaining matters. Granted that, other things being equal, a motor runs easier once it finds itself, as the saying goes, why should it not continue to run just as easily and develop as much power as when it was new, so long as it is kept in good running order. In fact, there have been stories to the effect that, like a man attaining his prime, a motor developed 20 to 25 per cent. more power when it was five or six years old than when it was brand new. The accuracy of such stories naturally depends largely upon the imagination of those who tell them, and when sifted carefully it is found that, as a general rule, the driver who tells them depends very much upon his instinct as to "how she pulls" regarding the amount of power developed.

But where an autoist is sufficiently observant to make careful record of the car's gasoline consumption, and detects a falling off in performance of a mile or two to the gallon, the matter is different. It goes without saying that any piece of mechanism loses in efficiency with age, despite the best of care, but there are not many automobiles in daily use that are old enough to come in such a category as would be implied by this. The motor in question had done some 10,000 to 12,000 miles, extending over a period of two years, with an almost unvarying record of fuel consumption. The case might appear puzzling at first sight, but a little questioning shed considerable light on the matter, and investigation proved the diagnosis to be quite correct.

The car had not been used much during the winter and had been put in commission without any preliminary overhauling of any kind. It had run probably a month or more in this condition, during which time the fault complained of was noticeable.

Gummed oil and carbon under the piston rings, preventing proper seating, and valves that needed a bit of regrinding, seemed to be most likely causes. Instead of resorting to the makeshift of flushing out with kerosene or gasoline, the delayed overhauling was given and the motor dismantled. The rings were found to be chiefly at fault, as the accumulation of caked oil and soot had prevented them from bottoming in their grooves at all.

An Unsuspected Cause of Ignition Trouble.

There is little doubt but that in the average autoist's mind the ignition ranks highest as a disturber of the driver's peace of mind. And his estimation of it is well founded at that, for it has been figured that, taking automobile shortcomings as a whole, the petty defections of the ignition system constitute fully half, and are in consequence accountable for most of the delays. But, though the ignition itself may appear to be at fault, it is not always due to some inherent cause, for, besides being the root of a very large part of the troubles that cause halts by the wayside, it also is the most susceptible essential of the power-plant. I saw this strikingly exemplified only very recently. Going along an out-of-the-way back road in the country road, I came across a party camped by the wayside. There were two young fellows and two girls, and the former looked as if nothing short of a Turkish bath would ever make them feel comfortable again, so dirty and bedraggled did they look; the feminine end of the party was still immaculate in all its summer finery, and though they had made light of the mishap at first, by the time we came along they looked as hopeless as the other two, for we were the first thing to pass along that way in two or three hours.

The car was of the light touring type with a horizontal-opposed engine under the body, so it may appear at first sight as if the predicament in question mainly grew out of its peculiarity of construction, but there is a lesson to be learned from it, none the less. Our proffered assistance was only too eagerly accepted; if we had gone by without at least the offer of a tow they would indeed have felt in the position of the shipwrecked party that sees its last chance of rescue fade below the horizon. "What's the trouble?" only brought a sadly prolonged negative shake of the head. A tow was the only thing in the driver's opinion, and though his knowledge of things automobile had suffered a severe tumble in the estimation of the rest of his party during the past few hours, no one suggested anything.

We began to nose around, and, as a preliminary, took out the spark plugs, much to the disgust of our friends, who remarked that they had had them out a dozen times or more, and they worked all right. The motor would start without any great difficulty, but would lay down again often before it had gone a block. A look at the plug ends showed quickly enough what was the matter; they were dripping with fresh lubricating oil, the gap of one of them being bridged by a fine big globule of the lubricant. There was no sight feed on the oiler, properly speaking, only a "bleeder," so-called, because it could only be called upon to see whether the oiler was working or not. We opened the oil tank and it was empty, though we were assured that a quart of fresh oil had been dumped into it before starting out. The rest hardly calls for any explanation. On opening the crank case it was found that the oil in it was so deep that it was slopping around inside the pistons. It was only a matter of a few minutes to draw most of it off, adjust the oiler properly, and fill it again. This and a cleaning of the plug ends set things right, and we were profusely thanked. While the ignition of an engine of this type is more prone to be interfered with in this way, an excess of oil is equally bad in a vertical engine, and it will work above the pistons. Beside its tendency to burn and form a troublesome carbon deposit there, it will also find its way to the spark-plug terminals and cause the cylinders to miss.

LETTERS INTERESTING AND INSTRUCTIVE

The Popular Fallacy of Starting "On Compression."

Editor THE AUTOMOBILE:

[751.]—In your issue of April 25, 1907, under heading "Brief Items of News," you have an article in which it is stated that a certain make of car, which was at the time in St. Louis, was started from the seat by the spark, after standing for one week; claiming that the compression had been held for that length of time (?).

I have frequently started a four-cylinder car by opening petcocks over cylinders, and squirting in a little gasoline, closed petcocks and started car from seat, without cranking, by throwing switch plug. There was no compression in cylinders.

Will you please explain these matters?

It does not appear to me to be necessary for an engine to have compression in cylinders to start from spark (or seat), if the gasoline vapor is there in sufficient quantity to ignite.

Dallas, Tex.

F. S. T.

Much of the ground included in your inquiry is covered by the answer in this issue to the letter of A. Conrad. As there noted, the popular impression that the sole reason for the ability of a motor to start by switching on the current lies in its capacity to retain a compressed charge indefinitely, is very general. It is merely one of those popular fallacies that originate in the air and take such firm root that it is impossible to eradicate them. Your experience in starting a motor from the seat merely by priming with gasoline through the petcock is a common one and can be repeated almost indefinitely on any good motor. Should such a demonstration fail to convince some of the doubting Thomases that the motor did really start without any preliminary compression of the charge, a very simple experiment should be sufficient to remove all question. Take an old tin can, spray its walls with a little gasoline; give the latter time to evaporate and then invert the can over a spark plug. Switch on the current and, unless too much gasoline has been used, the way the can will jump at the resulting explosion will be eye-opening. A modification of the experiment may be made by taking a short piece of iron pipe and plugging it at both ends with corks, through one of which the connections for firing the charge are inserted.

Tire-Valve Information Inquired For.

Editor THE AUTOMOBILE:

[752.]—Though I consider myself a seasoned motorist—if five years' experience as an owner of cars deserves to be termed a seasoning process—there are a whole lot of things that I desire to know about tire valves. Simple as this very small detail of automobile construction seems to most people, I believe that it is less understood than many a detail of far greater importance and complication. At least, in my own experience I am free to admit having never solved a number of the tire valve problems, and I am equally free to admit a thirst for information. Can you not, in "Letters Interesting and Instructive," explain a few of the peculiarities of tire valves—the ones with which every automobile user at one time or another has been confronted? For instance, what are the purposes served by each small part of the standard type of valve; what is the reason for valves sticking as they do sometimes against the pump, etc.?

DR. ELTON CARTER.

Madison, Wis.

The ordinary Schrader tire valve, now applied to nearly all automobile tires, is a much simpler affair than your criticisms suggest, but it is, as you say, subject to at least a few rather disconcerting ailments. Almost any tire catalogue shows sectional and other views of valve constructions, however, so we do not feel justified in using space to answer this portion of your inquiry. The sticking of valves, in spite of the highest pressures that can be brought against them by a pump, is due wholly to their exceedingly small size. The usual condition in a case of this kind is that the tiny rubber washer used to insure airtightness becomes gummed to its seat, in which condition it exposes a circle probably not over one-sixteenth of an inch in diameter to the pressure. The consequence is that a pressure even as high as one hundred pounds to the square inch figures out only about five ounces on the area it can reach, and this force is quite likely to be insufficient to dislodge the adhering part.

Position for Carbureter on Two-Cylinder Motor.

Editor THE AUTOMOBILE:

[753.]—Will you kindly give me some information on the following points? I have a two-cylinder, double-opposed, horizontal motor, the carbureter and intake manifold of which are situated, as per the accompanying rough sketch. Can I alter this so as to feed the fuel nearer to the inlet valve of one cylinder than the

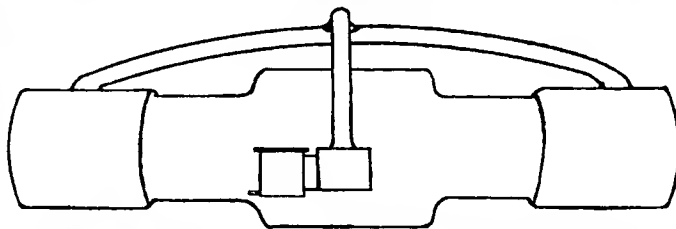


DIAGRAM ILLUSTRATING LOCATION OF CARBURETER AND MANIFOLD

other, and obtain as good result as is at present the case where the fuel is fed from the center of the intake manifold? By being able to feed the fuel from one end, I can save two elbows in the piping and reduce the length by about a foot of pipe, which should make the fuel better.

W. M. CASE.

Clarksville, Tenn.

Erratic running is apt to result from such a change as you mention, owing to the fact that as thus arranged one cylinder will be exerting a much more powerful suction on the jet than the other and the ratio of gasoline and air will accordingly vary with each power stroke. If it is merely desired to remove the carbureter to one end of the motor from its present position, this may be done by leaving the main portion of the manifold as it is and extending a horizontal branch from its center to the new location of the carbureter, as is done in the case of motors having such an arrangement. Designers differ as to the importance of having the carbureter as close to the inlet valves as possible and, while numerous motors are built on this plan, others are designed with the carbureter on the side of the motor opposite the intake, thus entailing an extra 20 to 24 inches of pipe or more. The theory is that the mixture is apt to wire-draw or condense in its passage through a long tube, while the opposing opinion of those who favor the long tube is that it always holds a supply of the mixture in reserve and its constant movement through the tube tends to make it more homogeneous, while the proximity of the tube to the cylinders prevents condensation. Thus the saving of a foot of pipe would hardly constitute a material benefit; the elimination of two elbows, particularly if of the right-angled type, might be of more importance, but as you have shown the manifold in your sketch it has uniform curve with an easy entrance at the valves, and we fail to see how you can improve upon this merely by shifting the position of the carbureter. If you will look through the back numbers of THE AUTOMOBILE you will find a case where a subscriber complained of having a great deal of trouble from just such an arrangement as you consider installing, and we advised him to alter the manifold so as to make the carbureter equidistant from both cylinders.

Recharging Dry Cells and Accumulators.

Editor THE AUTOMOBILE:

[754.]—Can a dry battery be recharged, and if so, how? I have at my disposal a dynamo and small switchboard, and from these how can I recharge a storage cell?

H. RELHAM.

Chicago, Ill.

It is possible, but not commercially practical, to recharge a dry cell. The latter does not constitute what is technically termed a reversible voltaic couple, *i.e.*, one in which the chemical processes of formation occasioned by the passage of an electric current through it, can be reversed by connecting the cell to some other piece of apparatus and using the current drawn from it. If a battery of dry cells be placed on charge for a considerable length

of time, a slight current may be drawn from them, but it would be about equivalent to pouring a bucket of water on a large quantity of sand and then squeezing the sand in an attempt to recover the water.

To charge a set of accumulators, the latter should be connected up so that the charging current is sent through them in the proper direction; that is, the positive pole of the dynamo must be connected to the positive terminal of the battery and the same with the negative. You do not mention whether your dynamo delivers an alternating or direct current. If the former, it cannot be used without the use of a converter of one type or another to alter the character of the current. We presume it is of the direct current type, so that this is not necessary. By storage cell we presume you refer to the ignition sets of accumulators usually employed, and will take one of these as an instance. Assuming that it is a six-volt set with a capacity of 60 ampere hours, the current sent through it must be regulated to conform to its size. The safe discharge rate of an accumulator is also its safe charging rate as a rule, and the former is generally stamped on the cell. In the case of a set such as mentioned the safe maximum would be a current of 10 to 15 amperes, thus completing the charge in from four to six hours. This is not at all to be recommended, however, as the slower the charge the better and a current of 2 to 4 amperes, extending the charge over a period of 15 to 30 hours, would be much better. The rheostat or resistance mounted on the switchboard should be employed to reduce the current to the amount required. You do not mention the voltage of the dynamo you have, but unless the latter be of the type employed for electro-plating, which is designed to give a large amount of current at a very low potential, it can be used. The current should have a potential of about 9 or 10 volts at least, as the cells when approaching the end of their charge reach a voltage slightly in excess of 2.5, or close to 8 volts, for the three-cell set. The evolution of gas becomes quite violent as the cell approaches repletion and the solution appears to be boiling, this often being regarded as an indication that the operation is complete, but it is not always reliable. Testing each cell with a low-reading voltmeter or with a hydrometer should be resorted to; in the former case the reading should be 2.5 volts or over, and in the latter a specific gravity of 1.2 to 1.26.

What Is the Cause of Lost Compression Here?

Editor THE AUTOMOBILE:

[755.]—I am a very interested reader of your "Letters Interesting and Instructive." Would like you to give me some information on the following:

I have four-cylinder motor, the dimensions of which are 4 1-2x5 inches; have run about 2,500 miles; when I first got the machine I could start on compression, and this was true until some time ago. Now it is impossible to start motor that way; in fact, after standing for some little time have to prime the cylinders before I can start. Have adjusted the carbureter in every possible way, reducing the air and gasoline and increasing both, but all to no effect. The motor has good compression, and once under way runs excellently; answers quickly to the throttle and to the slightest advance of the spark lever, but when throttled down will miss explosions and occasionally stop. Can make about 16 miles on a gallon of gasoline, which is considered very good in such a hilly district as this. Can you help me out? A. CONRAD.

McKeesport, Pa.

In diagnosing the trouble you have experienced as set forth in your letter, it is necessary to treat of it as two separate and independent ailments, as it does not appear that the failure to start on compression has any connection with the fact that the motor will not run satisfactorily at slow speeds. And before taking up the first, it may be as well to explain that there is considerable misapprehension extant as to the requirements of starting on compression, as it is called. It is generally conceded that it is practically impossible to make joints sufficiently tight to hold a gas under high pressure for any considerable length of time and it is doubtful if there is an automobile motor on the market that will retain more than a fraction of its initial compression for more than 24 hours. This does not mean that the motor cannot be started from the seat after that time, as there are cases on

record where a motor has been started in this manner after standing unused for a week or more, one such case being cited in these columns in the present issue (letter of F. S. T.), but it shows that the motor does not start *on compression*, contrary to the popular view. It does mean, however, that the cylinder about to fire has retained sufficient explosive mixture to ignite when the spark occurs, and as a mixture of gasoline vapor and air when exploded in a closed vessel without previous compression, generates a pressure that has been known to reach as high as 90 pounds per square inch, it will readily be evident that this is sufficient to start any well-balanced motor in good running order. One of two causes may be responsible for your present inability to start the motor by switching on the current without previously priming the cylinders. Either the valves and piston rings of the motor may have worn sufficiently to permit the escape of most of the gas or the surrounding temperature may have caused the condensation of the gas in the cylinder, this usually being the case in winter. The wear mentioned might be sufficient to permit the gas to leak away when thus standing and still not impair the compression of the motor sufficiently to make a perceptible difference in its working, owing to the fact that the film of lubricating oil that is formed is essential to good compression, and this film disappears when the motor stands idle for any length of time.

Carbureter trouble would appear to be the most likely cause of the second ailment, and the missing at slow speeds seems to indicate a mixture too rich in gasoline. It must be borne in mind, however, that the modern automobile motor is not designed to run at very slow speeds, and should not be expected to function regularly under 200 to 300 r. p. m.

A Question of Axle Design.

Editor THE AUTOMOBILE:

[756.]—Why is it that the front axles of automobiles are made heaviest and strongest at their ends, while rear axles are made stronger at their centers? I should think that the center would be the place for the strength in both axles, on account of the greatest strain being there. In all other structures, such as bridges, beams, and even the side members of automobile frames, the strength is placed at the middle; why not the same with a front axle? AMZIE GIFFORD.

Davenport, Ia.

Like many another criticism of standard automobile construction, yours comes from a misconception of conditions. An automobile front axle would need its greatest strength in the middle, as you suggest, if it were loaded at the middle and supported at the ends, as in the cases of the bridges, beams and frame members you cite. But, as a matter of fact, automobile front axles are supported at the ends and loaded—through the medium of the springs—at almost the same point. So the bending stresses due to load and road shock are not only much smaller than might appear, but are concentrated on the thickened ends of the axles. Were an axle loaded at the middle, the condition would be different, and then it would be sound engineering to use a beam construction with greatest strength in the middle. This has been the case with some old cars, and is the case now with the rear axles of propeller shaft-driven cars, which are loaded not alone with the vehicle, but also with the bevel gear drive and the differential.

Reaching Port with a Broken Chain.

Editor THE AUTOMOBILE:

[757.]—I have a car propelled with a double chain drive, and while on a short run a few days ago one of the chains pulled apart in such a manner that I was unable to fix it with any facilities afforded by the tool box. The result was that I finally had to have the car towed in, it proving impossible to drive it with one chain because the propelling effort was all absorbed in rotating the differential. I have since heard, though, that there is some way of tying parts of the mechanism so that the car can be run despite the missing chain. Will you please tell me if this is true, and, if so, how it can be done? E. A. KLING.

Sedalla, Mo.

By tying the countershaft sprocket over which the broken chain ran, so that the half of the countershaft to which it is attached cannot revolve, it is perfectly prac-

ticable to limp in on one chain with a car of the type you possess. To do so, however, especially if the distance be great, is to impose very heavy work on the differential, which is revolved under these conditions under heavier and more constant duty than any for which it is designed. A good precaution, to minimize possible trouble from this source, is to clean and lubricate the differential thoroughly before attempting the run. And it goes almost without saying that no high speed should be attempted. By all means the best plan is to secure a new chain, which will have the additional merit of impressing the desirability of carrying a spare one in the future.

A Propeller Shaft Breakdown.

Editor THE AUTOMOBILE:

[758.]—I am a driver of a small car possessed of propeller-shaft transmission to the rear axle. Several days ago I had the car out for a seventy-five-mile run, which I made in four and one-half hours over hilly country, but when within two miles of home I found myself in serious trouble. The car had been stopped for a few moments—up to which time it had seemed to run all right—and when I started up again for some reason the low gear refused to engage properly. I forced it, and the result was a lurch forward, followed by a grinding noise which continued as long as the engine ran, though the car stood still. I thought, of course, that the bevel gears had stripped, but an examination of them through a small opening in the case failed to disclose anything wrong. Nor does the change-speed gear seem injured. I now want to know what the matter is before I proceed further, for I fear that otherwise I may add to the trouble.

J. K. FOOTE.

Middletown, N. Y.

Several important points that might help the diagnosis are missing from your enumeration of conditions. You fail to state whether the change-speed gear is of the planetary or sliding type, and you do not assure us that the propeller shaft is all right. If the propeller shaft is of the type that is enclosed throughout its length by a non-rotating housing, it seems altogether likely that the shaft itself is broken, probably with a more-or-less irregular fracture, so that the ends scrape together. Or perhaps the propeller shaft is broken out of the bevel pinion, or away from the shaft that drives it, by the shearing of some key. Mere inspection of the bevel drive through a small opening in the case does not seem to us sufficient assurance that the bevel pinion is not stripped, and we would suggest disassembling the car until the trouble is definitely found. No more damage than already exists can result from this, if it is done carefully. As near as we can judge, the accident seems to have occurred through too sudden engagement of the driving mechanism, perhaps on an up-grade or in heavy pulling. This could be caused either by too quick throwing in of the clutch or a "fierce" condition of the clutch surfaces, possibly due to a coating of dust accumulated during the long day's run.

MR. MILTOUN SAYS FRANCE GREETES TOURISTS.

Editor THE AUTOMOBILE:

[759.]—The writer would like to reply to the statement made by your unknown correspondent, No. 701—an American automobilist, living at Vernon Eure—that invading American automobilists will not be chivalrously received in France.

The French as a nation, so far as they are in touch with touring automobilists, hotel keepers, mécaniciens and the like, may be depended upon to do nothing to drive trade away—and it is a very considerable "trade" that the visiting automobilist does in France, by spending his money liberally in hotels and garages. There may be exceptions to this ideal class of tradesmen, doubtless there are, but the writer has not found more than a half dozen lonely examples in a round of French touring of many years, beginning with a DeDion tricycle and so on through the gamut of automobile things until he has arrived to a "real" touring car.

As for the menacing gendarmes, they only do their duty when they ask you for your "papiers," if by chance you have come to rest at some picturesque spot just as a brace of them stroll by. All automobilists look alike, begoggled and berugged, and they don't care a jot whether you are a Frenchman or a stranger so long as they can make a report to their brigadier that they caught up an automobilist this morning. "sans papiers" or whose "papiers" were not "en règle." Whose fault is that, not the gendarmes', surely!

Now for speed limit, when you come to a great, staring sign indicating that speed in a narrow-built, twisting Grande Rue of

some hitherto unheard of little French town is, "by order of the Maire," reduced to ten kilometers an hour, it's wise to follow the warning—for many reasons.

The writer was recently an occupant of a high-powered car which bowled over a great shaggy "chien de berger" in a small town in Vaucuse recently, and killed it, too, through no fault of the driver. This must have been so because a gendarme standing by said so.

We'd all like to have that \$500 runabout of our dreams, and most of us won't care whether its American, French or German. It will be a good thing to have, but to expect France to draw her supplies of this class of vehicle, or any other, "tout entière" from America is indeed a beautiful dream.

Meantime American automobilists and American machines are increasing in numbers and favor in France; the former are very much liked and the latter are usually highly praised. So now! This is the point of view of another American automobilist living in France who signs himself,

FRANCIS MILTOUN.

Moret-sur-Loing.

AFTERMATH OF THE HARRISBURG RUN.

Editor THE AUTOMOBILE:

[760.]—During the recent endurance run of the Motor Club of Harrisburg the speed ordinances were observed by the contestants, but there were plenty of grafters in the small towns and boroughs. Manheim, Lancaster County, had a very enthusiastic gentleman, who never owned an automobile but who got very busy and took the numbers of all he could, and the town is now reaping the benefit of \$10 apiece from the contestants.

The fortunate thing for the operators is that each car had an observer, whose duty it was to record the speed of the car on which he was observer. This was done, and the Motor Club of Harrisburg promises a very exciting deal with the Manheim people as the outcome of the arrests.

Many of the towns along the way were wide open, and a great many suspended business in factories and stores while the contestants passed through, giving them a hearty welcome. It is no doubt best for a tourist passing through Manheim to leave his car on the outside of the borough limits and walk through with his numbers properly displayed in front and back of him, to avoid arrest.

A CONTESTANT.

Philadelphia.

A TIP FOR THOSE WHO TOUR TO DELAWARE

Editor THE AUTOMOBILE:

[761.]—Herewith please find a clipping from the "Blarestown Press" which should be read by automobile tourists who have in mind visiting the famous Delaware Water Gap and the Pocono Mountain country.

A SUBSCRIBER.

Portland, Pa.

From the "Blarestown Press": "The authorities at Portland are again active in watching for automobiles without a Pennsylvania license that cross the river from Columbia for the run to the Water Gap and up the Pike County road. Last summer the borough collected \$300 in fines. On a recent evening an autoist crossed over to Portland, and Constable Pensyl, noticing that the machine did not carry the required license number, put the driver under arrest. He said he would stay over night at one of the hotels and then borrow enough money next morning to pay his fine. The constable went home and to bed. The automobile man also went to bed, but he did not sleep as soundly as the constable; anyhow, when the constable came around in the morning the tourist had hid himself over the river and back to Jersey."

A TIP FOR DELAWARE WATER GAP TOURISTS.

Editor THE AUTOMOBILE:

[762.]—I am much interested in the American Gold Cup tour through Europe this season, and would like to have the names of the firms entering cars for the competition.

I recently made a report for the Department of Commerce and Labor concerning the tour, and the interest being taken in the event by European manufacturers and autoists. As a result of that report I have had a number of inquiries from interested parties concerning American cars, and requests for the names of those competing in the tour. I believe it will result in much new business for American manufacturers.

Lucerne, Switzerland. R. E. MANSFIELD, American Consul.

MORE ABOUT BATTERY CONSUMPTION WANTED.

Editor THE AUTOMOBILE:

[763.]—Not long ago numerous letters appeared in "The Automobile" on the subject of battery consumption, many of them bringing out some very interesting points to me—and I have no doubt to a great many other car users as well. From the tone of some of the letters I thought the subject was up for a thorough threshing out, but somehow or other it appears to have been sidetracked for some unknown reason.

W. R.

New York City.



MODEL XIX, 50-HORSEPOWER ST. LOUIS TOURING CAR.

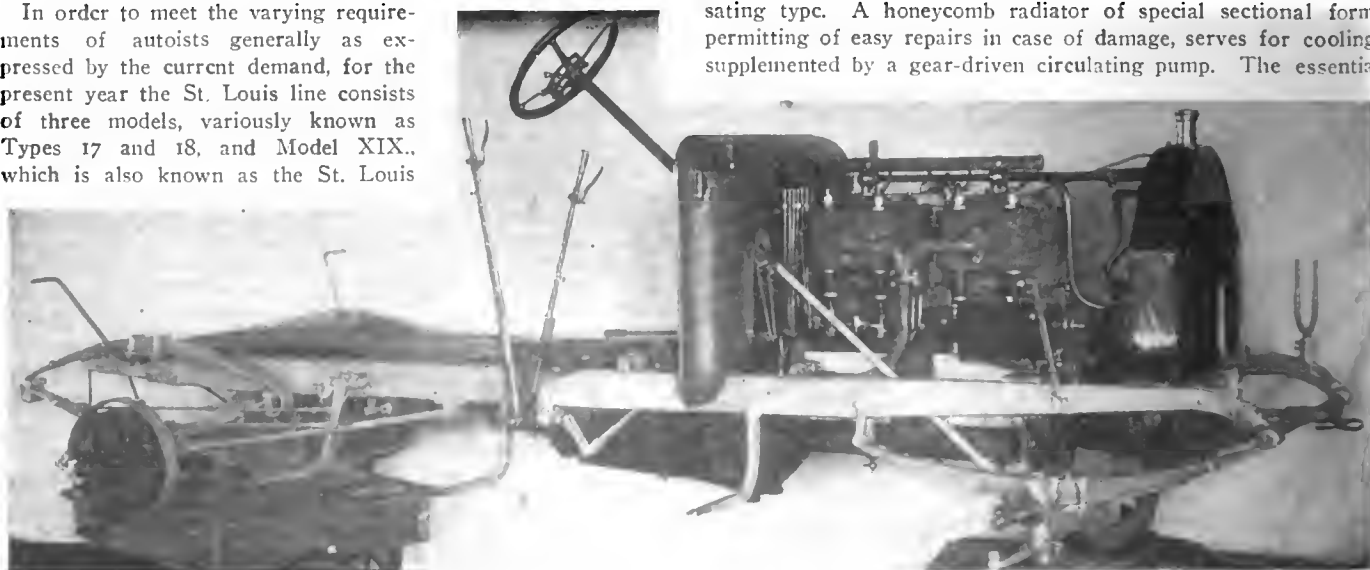
THE "St. Louis 50" has earned for itself an enviable position in the automobile world, and this distinction has come to the builders of "Rigs that Run," largely by their original and unique methods of construction. During the fourteen years the St. Louis Motor Car Company has built autos the aim has been to produce the best possible in construction and workmanship, and a careful study of the progress made shows how well this aim has been accomplished. Fourteen years ago this industry was given birth in a small shop of very crude nature (25x40 feet) in Nashville, Tenn., with John L. French as its originator and head. After many experiments, test trials, etc., the first rigs were placed on the market, and these models proved such a decided success that the company was encouraged to broaden out. The shop was increased from time to time until to-day the new factory at Peoria, Ill., covers a space of about two acres and a working space of 150,000 square feet, employing 350 men by day and 200 at night. In originating the much lauded integral system, three-point suspension and direct drive, the St. Louis is claimed to have been six years in advance of any other manufacturer in the automobile field.

In order to meet the varying requirements of autoists generally as expressed by the current demand, for the present year the St. Louis line consists of three models, variously known as Types 17 and 18, and Model XIX., which is also known as the St. Louis

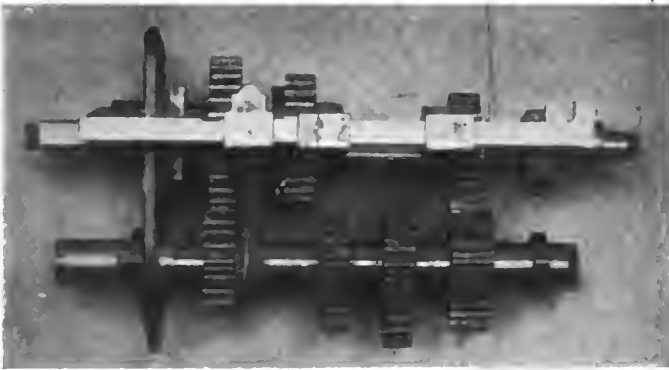
heavy touring car. This car is equipped with a 50-horsepower motor of special design that is built from beginning to end in the home factories.

Motor Design.—The cylinders are cast in pairs with oppositely disposed valve pockets, all the valves being mechanically operated, while the reduction gears for the camshafts and the auxiliary driving mechanism are all enclosed in a neat aluminum housing. Particular attention has been paid to the matter of accessibility, to which end almost the entire sides of the crankcase are made to open by means of readily removable plates, exposing the crankshaft and connecting rod ends for inspection and adjustment. The crankshaft is of special steel, and is offset from the cylinder centers in order to minimize side thrust against the cylinder walls on the explosion stroke. The main bearings, which are of substantial dimensions, are of a specially alloyed bronze.

The motor accessories are of standard types throughout, ignition being of the high-tension type, using accumulators as the source of current, while the carbureter is of the automatic compensating type. A honeycomb radiator of special sectional form, permitting of easy repairs in case of damage, serves for cooling, supplemented by a gear-driven circulating pump. The essential



INLET SIDE OF THE ST. LOUIS 50-HORSEPOWER MOTOR, SHOWING ITS SIMPLICITY.



SUPERIMPOSED ARRANGEMENT OF GEAR-SET SHAFTS. E!

of lubrication is taken care of by means of a large supply tank placed on the forward side of the dash under the bonnet, communicating with a force-feed oil-pump, which passes the oil through a number of sight feeds on the dash.

Transmission.—In accordance with current practice on the highest grade cars, a multiple disk type of clutch is employed, in connection with a sliding pattern of change speed gear with selective operation. Final drive is by propeller shaft, the relation of the various essentials of the transmission from the motor to the rear axle being so designed that with the normal load aboard all are practically in line on the same plane, any slight differences due to inequalities of the road being compensated for by the universal joints in the cardan shaft.

The frame is of the usual channel section pressed steel, supported on semi-elliptic springs forward and scroll elliptics in the rear, the spring dimensions being 2 inches wide by 40 inches long, each spring having 8 leaves. Thirty-four-inch wood wheels of the artillery pattern constitute the running gear and are shod with 34 by 4 1-2-inch tires of any standard make. Two sets of brakes are provided, both being centered in special drums on the driving wheels, and constituting a set of internal expanding and external contracting bands acting on the inner and outer faces of the drums, the usual method brake operation being employed. The body is designed along modern lines and is very roomy, having a seating capacity of seven with the addition of two extra revolving seats in the tonneau. All on, the car tips the scales at 2,600—a very moderate weight for its power.

Models 17 and 18.—The model 18 St. Louis has as its groundwork a 35-horsepower chassis, embodying all those features of modern design that distinguish the up-to-date car, and is intended to meet the very general demand for a moderate-powered and moderate-priced car, that is not lacking in any of those essentials of design or detailed refinements usually asso-

ciated with very high-priced cars. Model 17 is the same chassis equipped with a runabout body designed along attractive lines.

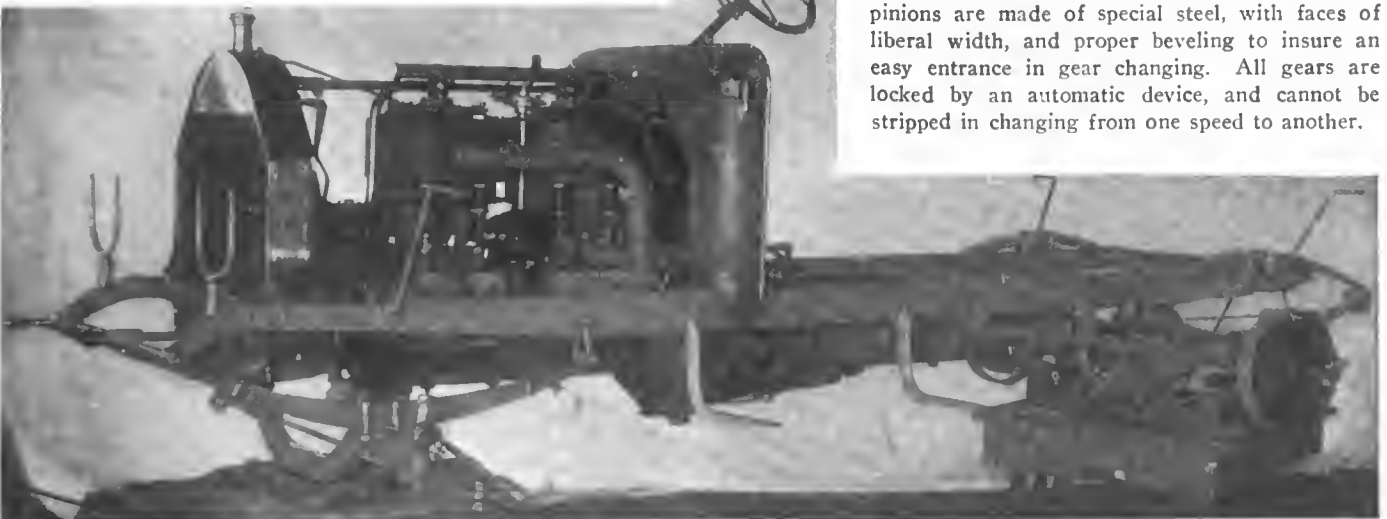
The power plant is of the unit type, in that the motor, clutch and change speed gear are housed together, the whole being supported on a three-point suspension, a feature of design which the builders of the St. Louis cars were among the first to take advantage of. The motor cylinders are cast in pairs, the valves all being placed on one side and operated from a single camshaft. The same degree of accessibility which characterizes the larger motor is also prominent in this, and every part is easy to get at. The ignition system is of the high-tension type, using accumulators, while lubrication is by means of a force-feed pump, combining the essentials of simplicity and reliability in the highest degree. Particular attention has been devoted to simplifying the ignition and piping connections, and the absence of unnecessary wiring or pipes is noticeable, while both the manifolds have been designed to be readily removable in half the usual time. The main bear-



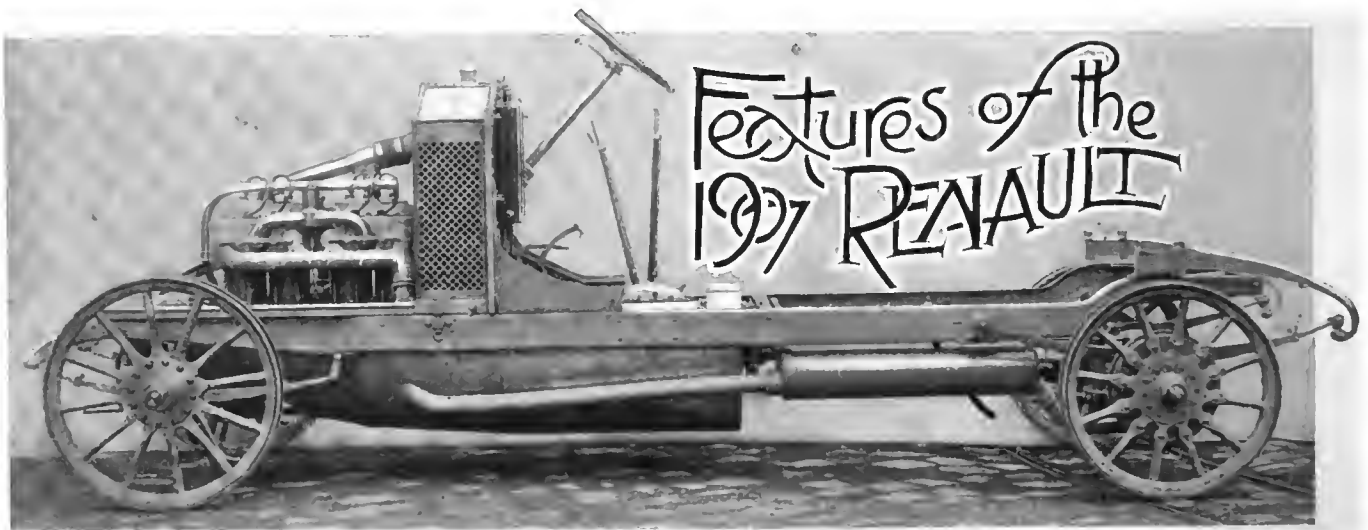
SIMPLE DETAILS OF THE MULTIPLE-DISK CLUTCH.

ings are accessible in a few seconds, as both the handhole covers may be removed by loosening a single bolt. The wheelbase of the car is 108 inches, and the tread is standard; with all on, the weight is 2,300 pounds.

One of the great advantages accruing from the use of the integral or unit form of construction for the power-plant and gear-set is the fact that all the mechanism is placed forward of the footboard of the driver's seat. A sliding type of gear-set is employed, providing three forward speeds and reverse. The pinions are made of special steel, with faces of liberal width, and proper beveling to insure an easy entrance in gear changing. All gears are locked by an automatic device, and cannot be stripped in changing from one speed to another.



CHASSIS OF THE "ST. LOUIS FIFTY" VIEWED FROM EXHAUST SIDE OF MOTOR.



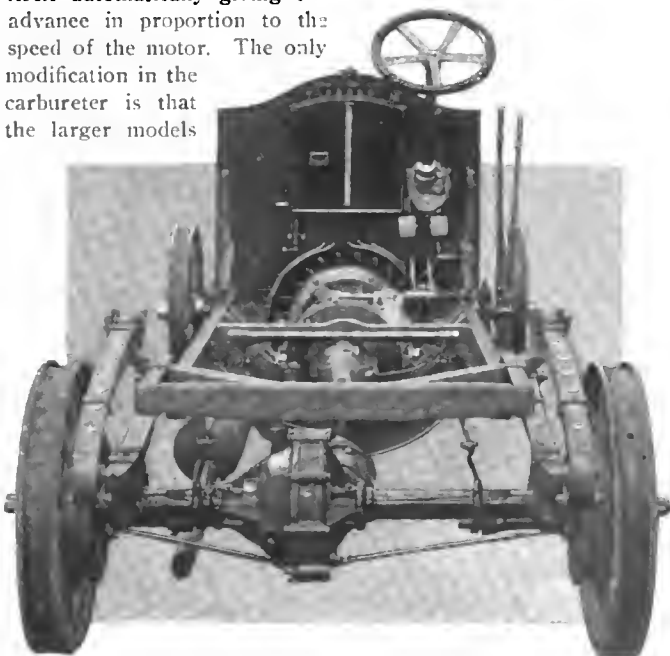
MECHANICALLY the 1907 Renault chassis has undergone few changes, all the features which contributed to make the output of the Billancourt factory such a huge success last year being retained, with a few modifications in detail, in the models which made their appearance in this country only a few days ago.

As will be seen from the illustration, the suspension of the two larger models, 35-45 horsepower and 20-30 horsepower, has been changed, three-quarter elliptic springs being now employed in place of the longitudinal and transverse rear spring. On the smaller models the older type of suspension is still retained.

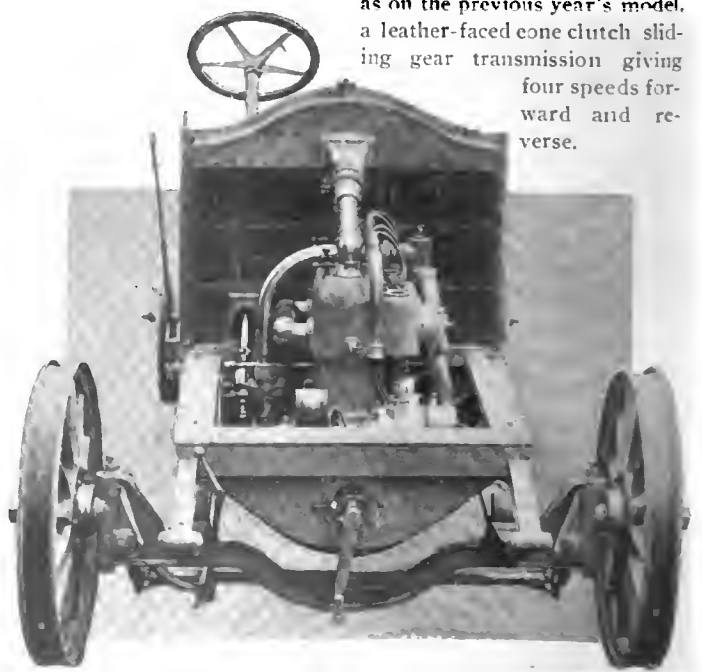
The four cylinders are cast in pairs, the crankshaft has three bearings, and all valves are mechanically operated by a single shaft, with cams integral. The pistons of the 35-45 horsepower Renault have four rings, three on the upper part of the piston and one on the lower part, the latter serving to clean the cylinder walls of lubricating oil, consequently keeping the valves and plugs in best condition. Ignition is as last year, by high tension Simms Bosch magneto, placed at the front of the motor and driven off the camshaft, all the gears being completely enclosed within the crankcase. This year's magneto is rather smaller than that employed on previous models. There is no advance or retarding spark mechanism on the Renault models, the magneto itself automatically giving the advance in proportion to the speed of the motor. The only modification in the carbureter is that the larger models

are now fitted with the small regulator on the dashboard, which has been a feature of the Renault cabs from their introduction, and by means of which the speed of the motor is regulated. The distinctive feature of the Renault system is that the mixture instead of being formed in the carbureter itself takes place in a chamber at the extremity of the intake pipes, and close to the inlet of the motor. The great advantage of this automatic carbureter over those generally employed consists in the fact that it is entirely metallic and does not comprise any membrane, piston or valve, the fragility of which is often a cause of annoyance. Engine control is unchanged by the modification to the carbureter, being, as before, by accelerator pedal and lever under the steering wheel.

Nothing is under pressure in the Renault, consequently there is a simplification of the motor unknown to most automobiles. If any further justification of the thermo-syphon system were needed it is found in the performance of the Renault car, which won last year's French Grand Prix, an event which, more than any other, tested the water-cooling systems of the motor. In addition to being exceedingly simple, the radiator again the dashboard gives the maximum of accessibility to the motor. A fan is combined with the flywheel and assures a constant passage of air around the vertical tubes. In the transmission everything remains as on the previous year's model, a leather-faced cone clutch sliding gear transmission giving four speeds forward and reverse.



VIEW OF CHASSIS FROM THE REAR.



CHASSIS AS SEEN FROM FRONT END.

A NEWCOMER FROM THE WEST: THE C. F.

CHICAGO is coming along as an automobile manufacturing center, the latest car to claim the Windy City as its birthplace being the C. F., made by the Cornish-Friedberg Motor Car Company, 1233 Michigan avenue. This newcomer to the ranks of automobiles turned out in the middle west is designed to cater to the large demand for a car with a four-cylinder vertical engine



THE C. F. 30-HORSEPOWER TOURING RUNABOUT FOR 1907.

as well as numerous other features only to be found in the higher-priced cars, and is listed at the low figure of \$1,750, complete. The motor cylinders are cast in pairs and their dimensions are 4 1/4-inch bore by 4 3/4-inch stroke, the motor developing 30 horsepower at a moderate normal speed. The cylinders are cast of special iron and the crankshaft is of nickel steel, somewhat of an innovation being found on the latter in the provision of oil rings on the main bearings. All the valves are placed on the same side of the motor and operated by a single camshaft, at the rear end of which it drives a vertical shaft through bevel gearing. The pump is located on the lower part of this shaft, while at its upper end it carries the ignition timer. All the reduction gears are completely encased in an aluminum housing. The lower half of the aluminum crankcase only serves as an oil-pan and is readily removable to permit of the inspection of the entire interior of the motor. In addition to the splash lubrication provided by the supply of oil in the crankcase, a mechanical force-feed oiler is used, with nine independent leads, insuring a positive supply of oil to all the important points as long as the motor is running. The oil passes through the multiple sight-feed tubes on the dash.

Ignition is by the high-tension system, employing a multiple-unit Splitdorf coil mounted on the dash, and a four-point roller contact timer, which, as already mentioned, is mounted vertically just forward of the dashboard, thus minimizing the amount of wire necessary. The regular equipment of the car includes a set of accumulators for service running and a set of dry cells as a reserve. The essential of cooling is taken care of by a fin tubular radiator, supplemented by a fan mounted on ball bearings, circulation being maintained by a gear-driven pump. Parsons white bronze is used for the engine bearings, which are unusually liberal-sized, the flywheel and main bearings measuring 5 inches in length, while the center bearing is 3 inches and the forward end bearing 3 7/32 inches. The entire engine is protected from beneath by a sheet-metal dust pan.

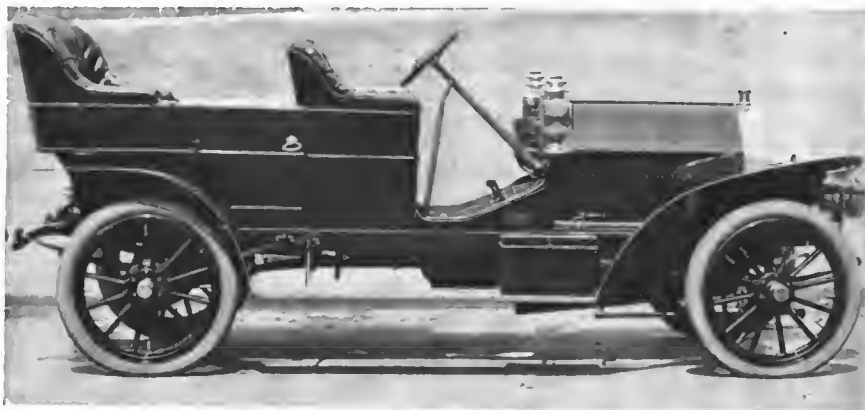
In order to render the car as simple and as nearly fool-proof as possible, a planetary type of change-speed gear is employed,

providing two forward speeds and reverse. The pinions are all of specially hardened nickel-steel and care has been taken to render the gear as nearly noiseless as possible, even when working on the low or reverse. Final drive is propeller shaft, the latter being of special steel, 1 1/4 inches in diameter and provided with Blood Brothers universal joints at both the axle and transmission ends. The front axle is of tubular steel construction, roller bearings being employed on the front wheels and also on the rear axle and wheels. The groundwork of the chassis consists of the usual channel-section type of pressed steel frame supported at all four points by standard semi-elliptic springs of liberal dimensions. The wheels are hickory, of the artillery type, and carry 12 spokes in each wheel; they are 32 inches in diameter and are shod with 3 1/2-inch Diamond wrapped tread tires on Marsh quick detachable rims. Two independent sets of brakes are used, both being centered in drums on the driving wheels and both operated by pedals, so that there is only one side lever. The steering gear is of the irreversible type and is provided with ample bearing surface throughout to prevent rapid wear and consequent looseness. Throt-

tle and ignition levers are mounted on a stationary quadrant placed over the steering wheel, the latter moving independently of the quadrant. The gasoline capacity is 20 gallons.

An attractive straight-line body with a seating capacity of five persons is used on the touring car, and a regulation type with jump seat on the runabout. The latter has a wheelbase of 108 inches on a standard tread, so that the rear seat of the tonneau is not only amply wide but there is also plenty of leg room for the passengers, something that is not always the case on the low-priced car. The standard finish is Brewster green, or red with black trim, but cars will be finished to specification when desired. The regular equipment consists of a pair of acetylene headlights and generator as well as oil side lamps and tail-light and a complete set of tools.

It will be apparent, both from the accompanying illustrations



THE C. F. TOURING CAR, CHICAGO'S NEWEST ENTRANT IN THE FIELD.

of the newcomer from the west, as well as the description given of the various parts of its power plant and chassis, that the effort to produce an up-to-date car to list at a very low figure has been unusually successful. Standard engineering practice has been followed throughout the design and construction, high-grade materials are employed and the general appearance of the car itself leaves nothing to be desired.

THE MODERN ART OF TREATING STEEL

By ALBERT E. SCHAFF, MANAGER POPE MOTOR CAR CO.

THE advance in the art of automobile building cannot be better illustrated than by taking up one leading topic in reference to the manufacture of the new alloy steels, which has marked an epoch in the art in the past two years. But a few years ago the automobile manufacturer had available for his use only low-carbon steels, which have been considered, and are considered to-day by most manufacturers, as quite good for the purpose. These low carbon steels, ranging in carbon from twenty to forty-point, greatly simplify manufacturing operations, since they require almost no treatment in their handling. No special annealing would be necessary in the drop-forging after leaving the hammer, and they could be then machined at high speed, running as high as ninety feet per minute; and, if the part in question were a gear blank, after the cutting of the teeth, the gears could be case-hardened by the ordinary simple process without the aid and great care required when the pyrometer is brought into use.

The price of this steel generally ranged between two and four cents per pound. It will be seen from this that the total cost of material and the labor was comparatively small. The steel itself gave but very little range in treatment. Its tensile strength was neither lowered nor increased materially by any treatment that could be resorted to. Hence the manufacturer had little opportunity to exercise his skill in the nice engineering of the various parts to secure suitable strength.

Vastly Greater Cost of Alloyed Steels.

When we come to chrome-nickel steels, we find at once a material that lends itself to a wide variety of uses. Arriving at the plant in the raw, unannealed state, at a cost anywhere from 20 cents to \$1.20, it will have to be annealed; and this process, conducted with but very little latitude in the degrees of heat, must be continued for some ninety hours, and as carefully cooled. It is then ready to be machined at a cutting speed of about thirty-five feet per minute. After machining, the piece goes to the hardening and tempering department, where it receives a series of careful treatments, varying according to the use to which the part is to be put.

To illustrate, two examples will be given; but, before doing so, it might be mentioned that chrome-nickel steel has a range of treatment which enables one to get from the same piece a tensile strength of only one hundred thousand pounds, with an immense deflective range, *i.e.*, by cutting the ultimate strength down, the piece is made so soft as to be able to bend almost double, like a hairpin, without breaking, thus making it suitable for places where vibration might attack and crystalize the metal. Or this same piece, if used in some place where immense resistance to torsion or direct shock is necessary, could be treated to give a strength of 250,000 or even 300,000 pounds tensile strength; but in the latter case it would be at the expense of the qualities just mentioned, and the metal would be hard and yielding, so that while it would stand an immense amount of stress in steady pull; on the other hand, if subjected to intense vibration, it might readily break—a characteristic to be avoided.

Of the two examples referred to above, we will take up the pivot-axle upon which the front wheels are mounted. Anyone will readily see that the safety of the occupants of a car depends not altogether upon the strength contained in certain parts, but upon its life. All metals are strong enough, as a general proposition, to resist the shock of an accident; still, most of them, if highly treated, will quickly succumb to the disintegrating strains of vibration. Therefore, a pivot-axle should be treated to give a low ultimate tensile strength with a low elastic limit in order that the metal should not be in such high tension as to be subject to attack by vibration. Automatically the metal is in a more mild condition and can be bent in a number of alternating directions before showing any damage to its fiber. Such a piece would

naturally more readily bend than that which is treated for a higher tensile strength; but at the same time it would be safer to have the piece in a condition where it would bend than where it would break.

Painstaking Care Necessary in Every Operation.

To get the results above described in the pivot-axle, the steel, when received from the manufacturer, is very carefully forged at a very low heat, being struck an innumerable number of light blows, with the temperature range of only about one hundred degrees. This means quick cooling and constant reheating, and reduces drop-forging almost to a hand-forging process, with the advantage, however that the metal, by being formed in dies, is given a better shape. It is next annealed very carefully, and when machined it is reheated, hardened and tempered. The treatments vary considerably from those of transmission gears, as we are aiming to get a tensile strength of about 110,000 pounds to the square inch, with a large deflective movement. In all of these operations of heating, quenching and drawing, pyrometers must be used, as the variation must not exceed 30 degrees, and the temperature runs as high as 1,450 Fahrenheit, it will be seen how carefully these operations must be conducted to produce the exact results required.

We now come to example No. 2, the forging and treatment of transmission gears. In order that the modern automobile may be made to yield the greatest power per pound of car weight, all the details must be carefully studied or a very heavy car with heavy wear on the tires and all moving parts will result.

The transmission gear being subjected (with the modern disc clutch) to small shock and very heavy torque, having most of its strains come upon one, and at best not more than two teeth at a time, must be given a treatment that will yield a very high tensile strength of, say, 225,000 pounds to the square inch, with a corresponding increase in its elastic limit. Although the steel for this purpose might be exactly the same base as used for the pivot-axle just illustrated, still a treatment is given to yield 225,000 pounds tensile strength. Instead of the piece being capable of bending almost double without breaking, it would probably bend but few degrees before it would yield.

Different Treatment Required for Various Parts.

However, the conditions to be met are so different from the case of the pivot-axle that it is highly desirable to give it this treatment, since the part must be made to resist an immense amount of strain without yielding in the slightest degree. After it is machined and the teeth cut, the gear must be carefully treated so that it will not warp, as these high-class alloyed steels are much more sensitive in this respect; the treatments in number are about the same as for the pivot-axle, excepting that they are carried higher and drawn less. The amount of carbon in the steel itself is a determining factor, to an extent, as a variation of even two points would naturally lower or raise the number of degrees of heat to be applied in the various operations. An even greater degree of watchfulness would be necessary where a high treatment is to be given, in order to confine the temperature variations within the closest possible limit.

When it is remembered that in the high-class motor-car steels elaborate treatments have been resorted to to meet the varying conditions in the steel itself, it will be seen how complex the problem becomes by the adoption of these chrome-nickel steels, some of which come with 35-point carbon, some 50, and others but 40. The old form of guessing the proper heat by the eye and holding the piece in the dark and determining the temperature by the color must absolutely be discarded if success in their use is to be had, as success can only be obtained by the adoption of new methods and skilled help.

THE DEATH OF ALBERT CLÉMENT.

A road accident, details of which the laconic cable messages from France fail to supply, has cost the life of one of the most brilliant of the world's racing drivers. Albert Clément was practicing on the Dieppe circuit on one of the six-cylinder racers which the firm constructed last autumn, when, in taking a curve at the village of St. Martin-en-Campagne, a few miles from Dieppe, the unfortunate accident occurred. Venus, who usually acts as mechanic for Clément, had been replaced by Gauderman, a close friend of the family, and a young racing driver of promise, who only entered the Bayard-Clément factory last year, and whose injuries are fortunately reported to be only slight. It would appear that a comparative test was being made of four and six-cylinder machines, for the firm has for some time been experimenting with six-cylinder engines, with the intention of putting a touring six on the market, and last fall built three powerful racers of this type, which have not yet been tested in any important event. The accident took place on the eve of the closing of the course to racing automobiles, the Automobile Club of France having sent forth an order that from the follow-



ALBERT CLÉMENT SHORTLY BEFORE HIS UNFORTUNATE END.

ing day until three weeks prior to the race no machine should be allowed to travel over the circuit at more than twenty miles an hour, in order that the surface might not be spoiled.

Albert Clément was the eldest son of Gustave Adolphe Clément, the head of the great Bayard-Clément factory at Levallois, near Paris, and Mezieres, in the Ardennes. The elder Clément, less than thirty years ago a modest mechanic and repair man, without wealth and with few material prospects, is to-day one of the richest men in France, and his son, had he lived, would have inherited a large fortune.

In the Ardennes circuit of 1904, Albert Clément made his first public appearance in an automobile race of any importance, when he captured first place with a voiturette from the parental factory. In the same year he created a sensation as the boy driver of the Vanderbilt race, in which event he lost first position to George Heath on a Panhard by less than two minutes. His performance was the talk of the race, for young Clément, then only nineteen years of age and of very youthful appearance, proved himself the equal of the most skilled automobile drivers of the world. The following year, in the French elimination trial for the Gordon Bennett contest, Albert Clément started fourth, but had to withdraw on the second round with a cracked cylinder. Owing to the imperfectly organized telegraphic service, no news of the young driver could be obtained for several hours, and it was only when Clément walked into the stand, having tramped over the mountainous country, that the anxiety of his parents and friends witnessing the race was relieved. In 1905 the Bayard-Clément team was not selected for the Vanderbilt contest; Albert Clément's public automobile

performance consisted of a dead heat with Hanriot on a Darraq light-weight racer on the Gaillon Hill.

Last year Albert Clément finished sixth in the Ardennes race, third in the Grand Prix and fourth in the Vanderbilt Cup. His performance in the Grand Prix will be remembered as one of the most brilliant and fascinating automobile races the world has ever seen. At the end of the first day Szisz was first, Albert Clément second, and Nazzaro third, fifteen minutes behind the young Frenchman. For over six hours the young Italian and the young Frenchman raced neck-and-neck around the course, Nazzaro seeking to shake off the fifteen minutes lost on the first day, and Clément doing his utmost to keep his rival in third place. None who witnessed it will forget the scene at the commencement of the last round but one. In his excitement Albert Clément overshot the gasoline station, and had to come back on reverse gear. Nazzaro was only a minute behind. Filling the gasoline tank by the ordinary feed pipe was too slow, and Albert yelled for the big cans to be handed over to him. One by one he emptied them into his tank, spilling the dangerous fuel over the car with the recklessness of a man who has reached the point when he must abandon all reserve. Never was a car loaded up with such rapidity, the youthful driver and his diminutive mechanic, Venus, displaying strength and agility that one would never have credited them with. At the commencement of the last round the Italian rushed by the grand stand only one minute behind Clément, and succeeded in capturing second position by a little over three minutes. Had Clément not persisted in his objection against dismountable rims he would in all probability have won the race.

At the time of his death Albert Clément was undergoing his three years' military service, from which he would have been released after the maneuvers of this summer. He was stationed at Vincennes, near Paris, and had obtained three days' leave to practice on the Dieppe course. Only a few weeks ago he had been refused leave of absence for the Targa Florio, and had very sorrowfully to abandon his place to his friend, Gauderman. In character, Albert Clément bore a close resemblance to his father, often spoken of as "the automobile king of France." Of a somewhat retiring disposition, quiet and thoughtful, there was under the unemotional exterior not usually associated with the French character, a genial nature, a ready wit and a strong individuality which won for him friends on every hand. Albert Clément is survived by a younger brother and two sisters, the younger of whom was married a few weeks ago to Ferdinand Charron, head of the C. G. V. firm, and also a successful competitor in early international automobile races.

MOTOR TRACTION IN GERMANY.

In the *Archiv für Eisenbahnwesen*, Vellguth has published a careful study of the costs of automobile traction. As regards the omnibus service in towns, he comes substantially to the same conclusions as did E. Manville in his discourse before the Automobile Club; but he is more pessimistic, says *Engineering*. In Germany, motor-omnibuses, he thinks, could hardly pay their way in towns of less than two million inhabitants, which means that Berlin alone could reckon upon such a service. Vellguth would not appear to make sufficient allowance for general and technical development, however. The cost of building the cars, of oil, tires, and working expenses will be diminished with increased number of vehicles, and longer experience will enable us to construct cars of longer life. As regards the omnibus service on the high roads, Vellguth may be more right in his verdict. One of the lines he deals with has a length of more than thirty miles; this Partenkirchen line is worked only in summer, however. On the whole, a light railway, driven by benzene motor cars, would be more promising than the omnibus, which transports only passengers, not goods. Vellguth gives a detailed estimate for the construction and working of a light railway of twelve kilometers (7.5 miles) length. Such a line would probably be more useful for agricultural and industrial districts than a mere passenger conveyance.

GRAND PRIX PREPARATIONS UP-TO-DATE.

PARIS, May 13.—Building operations have begun on the grand stands for the Grand Prix, and will be pushed forward with considerable activity. In order that the road surface may not be ruined by the rapid passage of racing machines and fast touring cars, the Sporting Commission has taken stringent measures. From Saturday next none of the racers engaged in the Grand Prix will be allowed on the course under penalty of disqualification, and the speed limit of eighteen miles an hour in open country will be rigorously applied to all touring cars. Three weeks before the race the course will be again opened to racers between 4 and 6 A.M. only. Racing drivers are taking advantage of the last days of liberty, and hardly an hour passes in the forenoon without the passage of some flyer at top speed. Le Blon has just come up from Nice on a 100-horsepower Panhard with Sider resilient wheels, which it is rumored will possibly be used in the race. Heath is out on his 1907 Panhard. Wagner, Lamberjack and Zedel are exploring the circuit on a Fiat touring machine, and Garcet is training with a new Bayard-Clément racer.

Speculation is rife as to the make-up of the Darracq team in the Grand Prix, as the result of the departure of Wagner. No official announcement has been made by the firm, but it is exceedingly probable that the machines will be handled by Hanriot and Demogeot, and that Caillois, who was to have steered a Commission Sportive racer, will take the place of Wagner on one of the more powerful machines. Rigal, who piloted a Berliet in the Targa Florio, will take the place vacated by Caillois.

In anticipation of an inrush of English visitors for the Grand Prix, a special agent of the *Service des Mines*, has been appointed at Dieppe to hold examinations and grant driving licenses to foreign visitors with the least possible delay.

FRENCH CLUB'S TOURING CONTEST UNITES 26.

PARIS, May 14.—Twenty-six machines are engaged in the only touring competition organized directly by the Automobile Club of France this year, under the double title of the Criterium of France and the Press Cup. The former is a touring event pure and simple, serving to eliminate machines for the final speed test to be run on a circuit near Trouville, with a limited fuel allowance. For one month more engagement may be sent in at double fees, but it is not likely that many firms will avail themselves of the privilege. Twenty-six cars are sufficient to assure the success of the contest, but are not sufficient to give to the event all the importance its promoters had hoped to secure for it. The complete list of entrants at ordinary fees is as follows:

- | | |
|-------------------------|--------------------------------|
| 1. Gladiator. | 14. Germain Chainless. |
| 2. Gladiator. | 15. Lorraine-Dietrich. |
| 3. Unic. | 16. Gobron-Brillie. |
| 4. Peugeot. | 17. Arles. |
| 5. Peugeot. | 18. Arles. |
| 6. Peugeot. | 19. Cottin & Desgouttes. |
| 7. Mercedes. | 20. Cottin & Desgouttes. |
| 8. Mercedes. | 21. Cottin & Desgouttes. |
| 9. De Dion-Bouton. | 22. Proudhomme. |
| 10. De Dion-Bouton. | 23. Cornilleau & Sainte-Beuve. |
| 11. De Dion-Bouton. | 24. Cornilleau & Sainte-Beuve. |
| 12. Vinot & Deguingand. | 25. Cornilleau & Sainte-Beuve. |
| 13. Germain Chainless. | 26. Argyl Motors, Limited. |

FRENCH ROUND-THE-WORLD AUTO SHOW.

PARIS, May 12.—There seems every possibility of the French floating automobile exhibition being carried through to a successful issue. The suggestion was made a few months ago that a large steamship should be fitted up with a representative collection of French automobiles and parts and sent on a voyage round the world, calling at all the important ports, and staying at each from one to eight days, according to the possibilities of doing business. The device adopted by the organizers of the scheme was to visit the largest number of important ports in the shortest possible time. The cooperation of the French consul in each

port visited will of course be secured, and a considerable amount of advertising done prior to and during the stay of the floating exhibition. Starting from Marseilles on a date yet to be fixed, the vessel will pass over to Algiers, call at Lisbon, then cross the Atlantic for Montreal, where a stay of six days will be made; Quebec will be given a three days' visit and Halifax may examine French automobiles for two days. American seaports to be visited are Boston, New York, Philadelphia, Baltimore, New Orleans and Galveston, New York being accorded eight days. Thirteen South American ports will receive a visit from the exhibition ship; two on the Pacific coast of North America; three in Japan; two in China; three in French Indo-China; three in British Indo-China; five in Australia; four in India, and finally Port Said, Alexandria, Tunis, and Marseilles. Altogether, fifty-four of the most important ports of the world will be visited. The length of the cruise will be from sixteen to eighteen months, exhibitions alone being responsible for not less than 240 days. If it is considered necessary in the interests of trade the stay will be extended, or new calling points will be added to the list.

TWO-CYCLE OFFICIAL TESTS IN FRANCE.

PARIS, May 13.—Up to the present very little attention has been given by French automobile constructors to two-cycle motors, no engine of this type being sold in France in appreciable quantities. To encourage the development of the two-cycle engine, the Automobile Club of France has authorized the Technical Commission to hold a competition open to both French and foreign two-cycle motors, using any kind of fuel. The competition will take place in the club laboratory in October next, but engagements must be made and a complete description of the machine given, in French, not later than July 31. Entry fee is \$20 per motor. All engines must develop not less than eight, nor more than 24 horsepower, and angular speed of the motor must not be less than 800 nor more than 1,500 revolutions per minute at maximum power. The competition will comprise a six hours' test at full charge, a three hours' test at half charge, and a three hours' test without load, the motor running at the same speed as when under full load. One day will be allowed for fixing the motor on the testing blocks, the second day can be spent in preliminary tests, the third day they must undergo the six hours' test, the two other tests being taken on the following consecutive days. Awards will be based on the power developed and on the cost of fuel consumed per horsepower-hour corresponding to the maximum of power. One hundred points will be awarded to the motor having the lowest consumption per horsepower-hour, and the same number of points to the motor developing the greatest proportion of power, the others receiving a number of points in degressive proportion.

FRENCH CLUB PROHIBITS SPEEDING.

PARIS, May 14.—Twenty-eight hours fourteen minutes is the record time in which the 1,500 kilometers separating Paris from Madrid have been covered by automobile. Sorel, an Anglo-Indian driver of much experience in racing events, established the record on a Lorraine-Dietrich, the start being made from near the Porte Maillot, Paris, and the finish in front of the Royal Automobile Club at Madrid. The average speed was 34 miles an hour, a marvellous record for such a distance.

This will be the last of the many attempts that have been made by automobile manufacturers during the last few weeks to establish record runs across France on unprotected roads. The Automobile Club of France having decided to take severe measures against firms indulging in such runs. Prohibition was imposed on the request of the British Automobile Club, English firms having been very active lately in making fast runs from London to Monte Carlo for advertising purposes. Generally the machines left London in the morning, crossed the Channel by a fast boat, and rushed from one end of France to the other at a speed which would not have been tolerated in the British Isles.

AUTOS SHOWED A LA HORSE FOR BLUE RIBBONS

PHILADELPHIA, May 20.—Fashionable Philadelphia must be given credit for having discovered and carried through to a successful conclusion a new wrinkle—an automobile carnival on the well-known lines of the horse show. As the prospectus of the affair put it, the show's object was "to bring to the attention of the trade and the thousands of automobile owners in Philadelphia in a practical manner and assist in bringing about the adoption of certain styles of carrosserie and appointments for specific

gowns without fear of buttings in on the part of J. Pluvius. The air was so balmy that the filmiest confections went.

The judges, with a swarm of two score "stewards," who stewarded not, to add éclat to the occasion (like the vice-presidents at a political meeting) finally began to throw off decisions in vast numbers. The program called for about ten minutes' work on each class. The majority of the twenty classes took considerably longer, so that at 6 o'clock the officials were awarding ribbons in

the class scheduled for 4:35. When, at 7:25, there was still one class to go—owners' electrics—and the grandstand was almost empty, the officials held a short council of war and decided to call it a day's work—and it was a hard one, too.

There are possibilities in the new game—undoubted possibilities. The eagerness with which contestants and spectators awaited the judges' decisions indicated that. Manufacturers' representatives and newspaper men were keeping tabs on the rising scores of their favorites and registering quiet kicks at adverse rulings, all of which goes to show that there was no lack of interest. The next affair of the kind—and the promoters aver that there will be another next year—will benefit by



THE INVITING FLORAL BRIGADE.

purposes and aid in determining a basis of what is and what is not necessary and in good form."

It was to see this theory demonstrated that possibly three thousand local automobile enthusiasts assembled at the Belmont Driving Park, Saturday afternoon, and patiently sat through a much-too-long program of events in which speed was a negligible quantity, and in which "appearance, appointments, and suitability for the work designated" were everything.

And the bold innovation was voted a success! True, the scions of aristocracy who conducted the carnival started operations over an hour behind the appointed time, and forgot lots of necessary trimmings. But "everybody" was there, and paid good money to be there. Everybody who could help was asked to help, for the object was a charitable one—to raise much-needed funds for the Pennsylvania Epileptic Hospital and Colony Farm. Result: Upwards of \$5,000 net for the worthy charity!

Such a gathering of the Quaker automobile clan was never before seen. Besides the more than 150 contesting cars—there were 220 individual entries—the incoming machines became so numerous that the paddock, the infield, and the backstretch were perforce used for parking purposes—at \$2 per. Really, the scene out-Wissahickoned Wissahickon at its Horse Show best. And the day was of the kind which permitted the display of new



THE COURSE AS IT LOOKED FROM THE CAPACIOUS GRANDSTAND.

the experience of the promoters of this one. Things will go smoother.

Aside from the Stoddard-Dayton in the runabout classes, and the Packard in the touring car section, no one car made a decided hit. The Stearns did get three blue ribbons, it is true, but nothing else, while the Pierce Arrow gathered ribbons in nine events, as did the Packard, but the latter had four blues among its plunder. The Stoddard-Dayton really was the hit of the show, getting inside of the money no less than eleven times—three blues, four reds, one orange, and three white ribbons. The Baker made nearly a clean sweep in the electric class, while the Mercedes led the foreign cars.

Miss Frances C. Griscom registered a double win in the ladies' obstacle and ladies' time races. Many a paid chauffeur could learn car kinks from that young lady, who can make her Royal Tourist do everything but talk. The only other lady to win a first in the various classes was Mrs. George M. Costello in her Stoddard-Dayton, which cleaned up a big field in the under \$2,500 runabout class.

The automobile "show" is a fixture.

The Score for the Afternoon.

The newspaper men present endeavored to arrive at a comparison of the afternoon's results by scoring points as in the intercollegiate championships—5 for firsts, 3 for seconds, 2 for thirds, and 1 for fourths. On this basis the results of the contests figure out as follows:

Cars.	1sts.	2ds.	3ds.	4ths.	Total Points.
Stoddard Dayton	3	4	1	3	32
Packard	4	3	1	1	32
Pierce Arrow	1	2	4	2	21
Stearns	3	.	.	.	15
Pennsylvania	2	.	1	.	12
Royal Tourist	2	.	2	.	10
Locomobile	1	1	.	2	10
Mercedes	1	.	1	2	9
Baker electric	1	1	.	.	8
Thomas	.	1	2	.	7
Oldsmobile	.	2	.	.	6
Autocar	1	1	1	1	6
Simplex	1	.	.	.	5
Winton	.	.	2	.	4
White	.	.	1	1	3
Ford	.	.	1	1	3
Pullman	.	1	.	.	3
Renault	.	1	.	.	3
Pope-Toledo	.	1	.	.	3
Rochet et Schnelder.	1	.	.	.	3
Acme	.	.	1	.	2
Reo	.	.	1	.	2
Columbus electric	.	.	1	.	2
Panhard	.	.	1	.	2
Dragon	.	.	.	1	1
Mora	.	.	.	1	1
Walter	.	.	.	1	1
Berliet	.	.	.	1	1

A. L. A. M. ANNOUNCES EDUCATIVE SCHEME.

A big scheme is on foot at the offices of the Association of Licensed Automobile Manufacturers to organize a library and central clearing house, where information on every phase of the automobile industry throughout the world will be available for ready reference. Every known automobile and engineering publication in America and Europe has been subscribed for and will be kept permanently on reference in the club library. Each week the contents of every magazine will be indexed and cross indexed in such a manner that a person desiring information on any given subject having been treated in magazines or newspapers will find it readily to hand. All articles of interest in the foreign publications will be translated into English and a summary of the world's automobile literature will be compiled and published in a weekly review which the Association intends to produce at an early date. The magazine, which will be supplied to all members of the A. L. A. M., will give condensed reports of articles of interest, with reference to the periodical in which the matter originally appeared, in order that those interested may readily obtain more detailed information when desired. H. T. Clinton informed THE AUTOMOBILE representative that a couple of editors would be appointed to take charge of the library and the magazine, and that a competent staff of translators would be set to work at an early date. The new department will be under the supervision of Coker F. Clarkson.

BALTIMORE'S CLUB WILL INVESTIGATE.

BALTIMORE, May 20.—The Automobile Club of Maryland has started a rigid investigation into the methods used by the country police in ascertaining the rate of speed of the automobiles. The investigation was the outcome of several complaints made by citizens who claim that they were unjustly arrested in the county on the charge of unlawfully speeding their automobiles. Advertisements have been inserted in the local papers requesting all who have been arrested in the county to make a full report of the circumstances attending their arrest.

CONCISE, SIMPLE RULES FOR 200-MILE RUN.

In formulating regulations for the 200-mile endurance run of the New York Motor Club, to be held June 6, the committee in charge, of which R. H. Johnston is chairman, has taken considerable pains to make the rules as simple and as concise as possible, omitting all unnecessary provisions. It has been found by experience that the numerous superfluous provisions usually inserted in such schedules only result in confusing the observers and checkers, as well as the entrants themselves. The contestants will be required to cover the distance according to a definite time schedule, an observer being assigned to each car in order to take note of all adjustments, repairs and replacements.

The start is to be made from Columbus Circle, New York City, the usual route along the river being followed northward as far as Poughkeepsie, where a turn to the right will be taken through Amenia, Lakeville, Great Barrington and Lenox to Pittsfield, Mass. At this point the route practically doubles back on itself until Chatham is reached, where it again turns northward to Albany, the distance being slightly in excess of 200 miles. A pilot car will precede the run, distributing confetti.

The cars will be divided into two general classes, denominated A and B, the former consisting of touring cars, and the latter



SOME PICTURESQUE SCENERY IN THE BERKSHIRES.

runabouts, or, as the rule states, "having a seating capacity for two or three persons." All cars must be regular stock patterns, and a catalogue describing the type of car to be entered must accompany each entry. The entry fee will be \$25 for each car, and the lists will be held open at the office of Chairman Johnston at 1402 Broadway until the evening of June 3. In order to determine the order of starting a drawing will be held as soon as all the entries are in. Each entrant is to nominate an observer.

Instead of converting the run into a race right from the start, a car that loses time between controls will not have to make it up between subsequent controls, but will have its time of leaving the next checking point advanced according to the amount of time lost and continue according to the same schedule of running, but with the new time.

Rule 7, which covers the matter of penalties for repairs, replacements and adjustments, provides as follows:

Rule 7. Penalties.—Each observer shall keep a written record of all adjustments, repairs and replacements made on the car in which he is riding, and the exact time so spent. A penalty of two points shall be inflicted for each minute or fraction thereof spent in making adjustments, repairs or replacements. No penalty shall be inflicted for work of any kind done on tires, but the time spent in tire repairs shall not be deducted from the running time allowed between the various controls. Contestants will be allowed, without penalization, to fill with water, gasoline and lubricant, to turn up grease cups and to oil the machinery, but everything else done on the car, aside from the normal operations of starting and of operating, shall involve penalties as above stated.

The start will be made at 6 A.M., and the running time provides for the arrival of the first car at Albany about 5 P.M., so that there will be ample time for all of the contestants to finish before the leaving of the night boat for New York.

SPRING DOINGS AMONG THE AUTO CLUBS

Chicago Clubs Working with Trade for Orphans' Day.

CHICAGO, May 20.—With the combined force of the Chicago Automobile Trade Association, Chicago Automobile Club and Chicago Motor Club exerted to make the event an unqualified success, motorists predict that orphans' day, June 12, will be a memorable occasion. The chairman of the committees representing the three organizations have already met to compare notes and arrange for a general meeting of their committees.

Joseph F. Gunther of the Chicago Automobile Club, L. J. Ollier of the Chicago Motor Club, and Walter Githens of the Chicago Automobile Trade Association, found on discussing the plans which they had outlined individually that they were in practical unanimity as to the course to be pursued. The field will be carefully laid out, they said, so as to take in every institution of the city in which parentless lads and lasses abide, and, after a trip from some central point that will take in the different institutions, the route will be laid out by the most direct course to some amusement garden, where the youngsters will be stuffed with peanuts and candy.

Local preparations include the appointment of a committee by the Chicago Automobile Club, which will have entire charge of the entertainment of the guests so far as the Chicago Automobile Club is concerned. Charles E. Gregory is chairman of this committee, and his associates are C. A. Coey and Joseph F. Gunther. At the same time as these appointments were made the board of directors of the Chicago Automobile Club decided to apply for a sanction for a race meet on July 13, the Saturday the Gliddenites are in the city.

It also was reported to the directors that the recent spell of wet weather has upset the calculations of the contractors, and that it will be impossible to have the new home in Plymouth court ready for occupancy by May 30, the date set some time ago. Instead, the opening will take place some time between June 1 and 15. The wet weather would not permit the plaster to dry, it is said; hence the delay.

Tennesseans Reorganize and Elect Officers.

MEMPHIS, TENN., May 19.—Matters of much importance to local automobilism were transacted at the recent annual meeting of the Memphis Automobile Club. The club was practically reorganized along lines that will better insure the safety of pedestrians, and in like manner the drivers of cars and other vehicles. Rules and regulations were passed, such as will proscribe the reckless members to carefulness and legitimate use of the machines. A reasonable speed limit was set. Under the rules adopted by the club the members will be required to conform to the State and city ordinances. The result of the election of officers for the ensuing year was as follows: President, S. T. Carnes; vice-president, S. B. Anderson; secretary, C. S. Williams; treasurer, J. H. Stewart.

Activities of the Automobile Club of Kansas City.

KANSAS CITY, MO., May 20.—With a membership of nearly 100, the Automobile Club of Kansas City, of which W. W. Cowen is the president, and E. J. McNamara secretary and treasurer, is preparing for a busy season. A hill-climbing contest is scheduled for May 30; a club run will be made to Lexington the first pleasant Sunday in June, and on June 12, following the suggestion of the A. A. A. Board of Directors, the club will conduct an Orphans' Day. A race meet is to be the fixture for July 4. The club is an active member of the Missouri State Association of the national organization, and its influence is very substantial. The backward spring has somewhat subdued automobile enthusiasm, the weather having been cold, rainy, and altogether the worst for this time of year experienced in Missouri for many years.

Why Worcester Club Will Not Hold an Economy Run.

WORCESTER, MASS., May 20.—Worcester Automobile Club will have no economy run this spring. This was decided at a meeting of the board of governors Saturday night. Chairman Frank L. Murdock, of the special committee in charge of the plans for a run on the economy and endurance basis reported the plan as feasible, but the board decided there was not enough unoccupied time. The board considered the events at Readville and Wilkes-Barre, May 30; the New York Motor Club's run, June 6; Orphans' day, June 12, and other events scheduled to come between the present time and the start of the A. A. A. tour, and, in addition, took account of the Old Home carnival in Worcester, June 17-20, which will take up the time and attention of many of the clubmen, and decided to call off the run for the present.

The Worcester club has held gymkhanas each year for the past two years. This year there is a prospect there will be a gymkhana on a larger scale. Plans are being talked of which will result in teams from the Worcester club, the Bay State Automobile Association and the Rhode Island Automobile Club, of Providence, competing in gymkhana stunts in each of the three cities represented by the clubs. The winners will be figured out when all three events have been had and their scores tabulated.

At the meeting of the board of governors, Saturday night, Chief David A. Matthews, of the Worcester police department, was elected an honorary member of the club.

New Jersey A. & M. Club Committees Appointed.

NEWARK, N. J., May 20.—At a meeting of the board of governors of the New Jersey Automobile and Motor Club, held last week, the following committees were elected to serve the ensuing year:

House—Joseph H. Wood, L. T. Wiss, Dr. James R. English, W. C. Shanley, J. M. Byrne, C. W. Oathout, J. H. Dawson, H. T. Meyer, C. W. Baker, Theodore Mertz, F. A. Croselmir.

Legal—W. F. Kimber, J. H. Wood, James R. English.

Membership—P. E. Heller, G. H. Simonds, C. A. Westervelt.

Legislative—W. C. Crosby, Dr. H. Crittendon Harris, R. C. Jenkinson, Arthur Heller, G. E. Long.

Race—W. C. Shanley, J. W. Mason, H. B. Niblette.

Good Roads—J. H. Wood, W. J. Morgan, H. P. Cook.

An Excellent Plan of Holding Club Runs.

BROOKLYN, N. Y., May 20.—The Runs and Tours Committee of the Long Island Automobile Club has adopted an excellent plan for the holding of its club run. A rendezvous is appointed to be reached for dinner at a specified hour, and it is up to the participants to reach the place leisurely or do some traveling at the limit of legal speed. The committee consists of Charles Jerome Edwards, James Edward Bristol, and William Schimps. Yesterday's rendezvous was at the Hotel Gramatan, Bronxville. In announcing its runs the committee gives the exact route on a postal card. May 25 and 26 there will be a two-days' run to the Shinnecock Inn, Shinnecock Hills, L. I.

Seattle's Club to Have a Floral Parade.

SEATTLE, May 20.—Opening with a floral parade in the morning, there will be two days of racing at the Meadows, May 30 and 31. The parade will unquestionably be the finest that has taken place on the North Pacific Coast. The Automobile Association is working hard, and, as there are so many new cars here this spring, the interest is naturally great. There will be no trouble about the floral part of it, as all sorts of flowers, domestic and tame, are now in bloom. The receipts will be used towards building an automobile boulevard, which in time will extend around Lake Washington, a drive of 135 miles.



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The Many Who Suffer for Sins of the Few.

The many answering for the sins of the few is becoming too much for law-abiding autoists, and a letter from the Runs and Tours Committee of the Long Island Automobile Club is well worth perusal and duplicating by clubs in sections where the technical trapping of autoists is being carried to an extreme. Here is what the Long Islanders say to their members:

"To the Club Members—The Board of Governors has directed this committee to exert every effort in order to protect Long Island automobilists from the unjust, if not unlawful, methods which have been followed by local constables at some points, and the prosecution of autoists on purely technical grounds. The committee is also conferring with the president and board of trustees of each incorporated village on Long Island, with a view to having the corporation limits of each village fixed and properly designated by signs.

"While the club has little sympathy for the persistent violator of speed ordinances, or the reckless driver, whose fad is to hit up a 35 to 50-mile gait on the country highways, on the contrary we know that great injustice is done to the average autoist who is a careful and moderate driver, who may innocently exceed the regulations and thus be made the victim of some local constable, or police trap.

"This committee especially urges that each member report to the chairman by letter, regarding any police traps which come under his observation. By this is meant the stationing of constables, with ropes, cables, etc., to make arrests at the extreme limit of village boundaries, where it is practically farming country.

"I trust you will co-operate regarding such conditions that come under your attention, as it is the purpose of the club to locate men at such points in order to warn automobilists and protect them against such unfair methods. Yours fraternally,

"CHAS. JEROME EDWARDS, Chairman."

Autoists who drive to the danger of other users of the road should be arrested and fined, but to set traps in out-of-the-way

places, in the outskirts of cities and towns, is a plan of procedure never intended by the framers of the law. It is doubtful, however, if the present wave of "trapping" will cease until the law has been changed in such a manner as to make impossible this form of graft, for country constables are multiplying faster than communities are beginning to realize the difference between catching violators of the rights of other users of the road and those who might happen to be traveling at a pace slightly in excess of the designated speed limits and still without inconvenience or danger to the other occupants of the highway.



The Need of Simplifying the Lubricating System.

Simplicity and reliability are so closely interrelated that even to the veriest layman the presence of a number of small parts spells complication and a liability to derangement that diminishes in proportion as the parts subject to defection decrease. Not that all apparent complication is dangerous, particularly as such an opinion regarding a device may be the result of ignorance rather than otherwise. For that matter, all complication is not apparent by any means; it is frequently hidden under a severely simple exterior, and therein lies the danger. This is true of some lubricating systems, while others stand self-revealed. When it is borne in mind that lubrication constitutes the very life of the motor, the necessity for absolute reliability in this essential becomes evident. A failure of the ignition current or of the fuel carries its own warning; in the case of a shortage of lubrication it comes too late to avert the damage.

Despite the most painstaking care that can be exercised, foreign matter occasionally finds its way into the gasoline, and the same is true of the lubricating oil. Due to its far heavier consistency, it constitutes more of an obstacle to the flow of the latter than of the former, yet it is not difficult to find cars on the market to-day, the lubricating systems of which are characterized by a maze of fine bore tubes. In sharp contrast with these are those simple systems of pump circulation which insure a constant supply of oil to all the important bearings as long as there is any in the supply tank, and this with but a fraction of the parts necessary to accomplish it. Of course, there is something to be said on each side, but it would certainly seem as if the tendency to reduce this essential to its lowest terms, thus enhancing its reliability, constituted real progress.



Interest in the Two-cycle Motor Abroad Active.

Despite the advanced state of reliability and efficiency to which the four-cycle motor has been brought on the automobile, there appears to be no question that it is not generally regarded as representing finality of design in this direction. With its more or less numerous moving parts of small size and its inherent defect of producing but one power stroke in every alternate revolution, it goes without saying that, from an engineering point of view, the four-cycle motor presents ample room for improvement—an indictment that will not be denied even by its firmest upholders. The question has been one of method rather than doubt as to the necessity for betterment. It has long been recognized that the two-cycle principle offers the foundation upon which to build in this direction, but even the least enthusiastic supporter of its rival has not been convinced that sufficient progress has been made to warrant abandonment of the four-cycle.

What is needed is investigation and experiment; if half as many builders had been devoting their attention to the evolution of the two-cycle motor as has been the case with its competitor, it is safe to say that more would be known—the problem would be better outlined to-day than is at present the case. Though great success has attended the use of large stationary units of this type on the Continent, it has justly been considered a particularly sterile field for the two-cycle motor where the automobile is concerned, so that the announcement that the Automobile Club of France will institute a series of trials of two-cycle motors is somewhat of a surprise.

A. M. C. M. A. TACKLES SHOW SITUATION.

Despite the great amount of show talk that has been going the rounds ever since the close of last winter's season, the American Motor Car Manufacturers' Association has maintained a discreet silence regarding its plans in this direction, so that show business was the chief thing of importance before the regular quarterly meeting held last week in Detroit. The date for next fall's event is still held in abeyance, although it is generally thought that Horse Show week (November 16-23), which brings a representative gathering to New York, will be decided upon. As was the case last year, the show will be held in conjunction with the Automobile Club of America, and several makers who are not members of the association, but who will exhibit at the Grand Central Palace next fall, were invited to attend the meeting to discuss matters.

It is a matter of common knowledge that the old Grand Central Palace is soon to go down before the march of improvement in that section, so that the question of housing a show for 1908 was also taken up and an important proposal offered in connection therewith. This involves the erection of a show building further uptown—in Harlem, to be as definite as possible—and one that will be half again as large as the Garden. The American Motor Car Manufacturers' Association would have control over the building so far as automobile shows were concerned, and it is given as the opinion of the promoters of the scheme that such a structure would prove a success purely as a show building, owing to the fact that many organizations find it impossible to exhibit in New York owing to the exclusive contracts granted by the Garden.

Reports of trade statistics from various members of the association were read at the meeting, and revealed an increase of fully 25 per cent. in the registrations this year up to date, despite the adverse weather conditions, and it is confidently anticipated that sales will show an increase of 50 per cent. over those of last year. It is calculated that there are, at present, about 125,000 cars registered in the country, the reports revealing the fact that the demand for light cars selling at figures below \$2,000 has largely increased, though the demand for heavier cars has not been affected. The increase in the demand for small cars is reflected by the fact brought out in the reports that New York's April registrations showed the Ford Motor Car Company to stand at the head of the list, with the Maxwell-Briscoe Motor Car Company second, and the Reo Motor Car Company, fourth.

Though testimony was being taken in Detroit in the suit against the Ford Motor Car Company while the meeting was in progress, Selden matters were not much discussed.

There was a record attendance at the meeting, the following concerns being represented: Thomas B. Jeffery Co., Kenosha, Wis.; Aerocar Co., Detroit; Maxwell-Briscoe Motor Co., Tarrytown, N. Y.; Motorcar Co., Detroit; Jackson Automobile Co., Jackson, Mich.; Ford Motor Co., Detroit; Premier Motor Mfg. Co., Indianapolis; Reo Motor Car Co., Lansing, Mich.; Welch Motor Car Co., Pontiac, Mich.; Austin Automobile Co., Grand Rapids, Mich.; St. Louis Car Co., St. Louis, Mo.; Rapid Motor Vehicle Co., Pontiac, Mich.; Wayne Automobile Co., Detroit; Dragon Automobile Co., Philadelphia; American Machine Mfg. Co., Detroit; National Motor Vehicle Co., Indianapolis; Mora Motor Car Co., Rochester N. Y.; Nordyke & Marmon Co., Indianapolis; Moline Automobile Co., Moline, Ill.; Mitchell Motor Car Co., Racine, Wis., and the DeLuxe Motor Car Co., Detroit.

ONLY FOUR COACHES FOR ANNUAL PARADE.

PHILADELPHIA, May 20.—President Edward Brinton Smith, of the local Four-in-Hand Club, blames the automobile for the rapid decline of his favorite sport. The annual parade of the club took place May 11. In former years upwards of a score of big tally-hos were in line, with horns blowing and whips snapping. Saturday's affair, however, was quite dismal in contrast. Just exactly four coaches put in an appearance at the Bellevue-Stratford, the starting point.

TAXIMETER CABS COMING TO NEW YORK.

Three hundred automobile taximeter cabs, especially designed for this work and constructed in the new Darracq cab factory at Suresnes, near Paris, will be in service on the streets of New York City about the end of July, declares Walter Allen, of the Motor Carriage Company. A few weeks ago G. Winthrop Sands, president of the company, sailed for Europe, and has fixed upon the Darracq as the most suitable vehicle for service in this country. The chassis is a four-cylinder 15-horsepower model with shaft drive, simplified and rendered more accessible in view of the rougher service it will have to perform. A very neat type of landaulet body will be supplied by Védrine from the special body-building works at Rouen, France. It is the intention of the exploiting company to charge something like thirty cents a mile, or one dollar and a half an hour. Almost a thousand cabs of this description will ultimately be put into service in New York. Negotiations are on foot for establishing similar services in Boston, Washington and Chicago.

NEW JERSEY'S ELEVENTH HOUR AUTO BILL.

TRENTON, N. J., May 20.—Many automobilists are unaware that in the closing hours of the Legislature a bill was put through the House just before adjournment and during the usual confusion. The Associated Automobile Clubs of New Jersey will endeavor to convince Governor Stokes that the bill should not be signed. The measure provides that all police officers, constables, or other officials who do not see to the enforcement of the automobile law may be fined a sum not to exceed \$200, or be peremptorily dismissed. Provision is made for twenty-five paid inspectors and a like number to serve without salary. The Commissioner of Motor Vehicles is given an increase of \$1,500 in salary and also provided with a chief inspector at \$1,500. Clauses regarding foreign autoists and drivers' certificates are also included, the tenor being to make the restrictions more severe. Those who have examined the measure contend that it is unconstitutional.

PENNSYLVANIA'S TWO BILLS ARE DEAD.

PITTSBURG, PA., May 20.—Owing to the unfortunate animosity of the Speaker of the Pennsylvania House of Representatives to the Senators who opposed one of his pet measures, sixty-eight Senate bills were practically killed in the House by the Speaker without any regard to their merit. Among them was the new Pennsylvania Motor Vehicle law, which granted reciprocal registration to automobilists registered in their home States. The Sproul State Highway bill, appropriating \$1,000,000 for the improvement of the Philadelphia-Pittsburg road, was another commendable measure which was killed. Both of the bills had passed second reading and would have gone through without any opposition. Everything was done to secure a third reading for these bills, but it was impossible. Paul C. Wolff, secretary of the Pennsylvania Motor Federation, which is the State organization of the A. A. A., was unceasing in his efforts to get the measures passed.

SEC. BRITTON TAKES UP MISSOURI STATE WORK.

ST. LOUIS, Mo., May 19.—Roy F. Britton, the veteran secretary of the St. Louis Automobile Club, has retired from that office, his new duties as secretary of the Missouri State Automobile Association requiring his entire time. He is succeeded by Samuel D. Capen, who was chosen at the recent annual meeting of the club as secretary and treasurer. All the other officers of the club were reelected: President, Alexander Euston; vice-president, Dr. E. M. Senseney; board of governors, Roy F. Britton, Alexander Euston, A. B. Lambert, H. S. Priest, Dr. E. M. Senseney, and G. M. Wright. Secretary Capen, D. R. Calhoun, and J. A. Seddon were elected on the board to fill vacancies. The treasurer's report showed a comfortable balance in the club treasury.

STORY OF AN INDUSTRIAL ACHIEVEMENT.

From a start on a capital of \$3,000, representing the savings from a soldier's pay, to the head of a corporation capitalized at \$22,500,000 in less than 30 years, sounds far more like a fairy-tale than a record of actual fact. It briefly sums up in large measure the history of the bicycle and the automobile in this country as influenced by the career of Colonel Albert A. Pope, which is set



COL. ALBERT A. POPE.

forth in a very attractive volume entitled "An Industrial Achievement." Like most of the vast manufacturing interests for which this country is noted, the Pope business began in a very modest way. The start was made immediately after the Civil War at 87 Summer street, Boston, in a single room, up three flights of stairs. It was not until 1876 that the Pope Manufacturing Company came into existence, and its attention was then devoted to the handling of small patented devices, among which the most prominent was an air-pistol. In

its desire to expand the company took up the bicycle, and it is interesting to note that the first machine built by Colonel Pope and his English friend, John Harrington, cost \$313.

At the very outset of its manufacturing career the company found that the patent situation was controlled by others; Richardson & McKee, of Boston, held one of those rare basic patents which make manufacturing without a license impossible, and excessive royalties threatened to end the existence of the business. In the final acquisition of this patent was laid the Pope policy, which has ever since been adhered to—that of fostering industry by issuing licenses to all reputable concerns who chose to engage in the same line, a right to manufacture even being granted to Cunningham, Heath & Co., old rivals of the Pope interests, and who, had they seen fit to take advantage of an offer of the patent when first presented to them, might have ended the latter's career. Not long after the acquisition of this first basic patent, the Pope company was assailed on all hands by people claiming to own patents essential to the manufacturing industry at that day and numerous actions were brought. Here again great foresight was shown by obtaining control of all patents that had a bearing on the bicycle industry. The judgment of the company in acquiring control of such patents was manifest in the fact that the litigation was always decided in its favor, while the wise policy followed on the whole patent question was strongly emphasized by the fact that after the expiration of a number of these patents, the price of the articles manufactured under them actually rose instead of falling off, as is usually the case.

But the growth and development of the Pope interests is a long story, only to be adequately told in a volume such as the one under review. The Pope Manufacturing Company increased its original capitalization of \$100,000 to \$1,000,000 within a few years. Its history since then has been one of upward leaps and bounds, but not like that of many another, merely the recital of increasing facilities to take care of increasing demands. It is far more than that, for the demand itself had to be created in the early days, and in doing so Colonel Pope benefited the country as a whole far more than he did his own company. The combination of such policies with that of judicious and widespread publicity has made the Pope name a byword the world over. The lead it assumed in the bicycle business made it thoroughly fitted to assume the same rôle in the case of the automobile, in which field its achievements are a matter of common knowledge. This unique publication is an 88-page quarto volume, executed by the Bartlett-Orr Press in a style that fits it to grace any library shelf.

ELEVEN HUNDRED MILES IN THE RAIN.

An eleven-hundred-mile automobile tour over a thousand kinds of roads, but during one continual kind of weather in the form of a spring rainstorm, was made last week by S. D. Waldon, sales manager of the Packard Motor Car Company in a 1908 Packard "30." The trip was a hastily conceived testing tour to try out the qualities of one of the four experimental Packards of the new model, and starting with a New York to Boston run, was continued back to New York by another road, and thence to Philadelphia and Pittsburg.

From New York, the run was made to Boston via New Haven and Hartford, the time from Hartford to Boston being 3 hours 35 minutes. After a rain-soaked day of demonstrating about the Hub, a party, including Alvan T. Fuller, of Boston, was made up for the return to the metropolis by the shore route through Providence. There was not an inch of dry road or a liter of dry weather as the car swept at a furious gait along the stone roads, blown by the Atlantic winds. Most of the way the going was firm, smooth and fast, but in sections the way was disputed by miles of loose boulders and ridges of native rock.

The next day, after luncheon in New York, a quick afternoon run down the famous New York-Philadelphia road was made, the highest speed reached on the good stretches being 68 miles an hour by the speedometer. That evening preparations were made for the mountain-climbing, valley-spanning chase to Pitts-



S. D. WALDON, WITH 1908 PACKARD "30," A VETERAN TRYER-OUT.

burg. The party for this last stage of the trip included Mr. Waldon, Mr. Fuller, Mr. Godshalk, of Philadelphia, and the latter's unknown friend, "Bill." Acting upon the counsel of Philadelphians who previously had made excursions into the fastnesses of Pennsylvania's tortuous mountain highways, a 5 o'clock start was made in the morning. The road taken was that leading through Columbia over the historical battlefield of Gettysburg and to Chambersburg, and thence directly across the many ridges of Allegheny mountains that corrugate the surface of Pennsylvania into rocky roads which sink to sea level only to rise successively to heights above the clouds. The storm had so deluged the countryside that hardy mountaineers of southern Pennsylvania, who had noted the characteristics of travel in all its many conditions, warned the tourists against proceeding, and predicted their failure to make the goal. All the time there was rain, and every mile was a rocky mile.

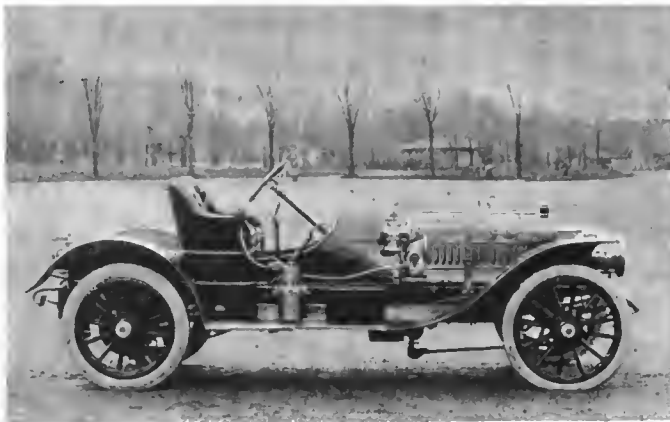
Incidents were frequent, but there were no accidents, and the progress, while rough and dangerous, was steady and sure. Three hundred and twelve miles to Greensburg were covered that day, and then a bursted tire caused a delay which brought on the growing blackness of night, and the trip was stopped until the next morning, when the run into the steel city was completed. While this ended one tour, it was only the beginning of the work that the car is now undergoing.

A RAMBLER'S 222-HOUR NON-STOP RECORD.

MINNEAPOLIS, MINN., May 20.—After running 222 hours, from 3 o'clock on the afternoon of May 10 to 9 o'clock Sunday night, May 19, and establishing a new record for a two-cylinder engine, the Model 21 Rambler, which was put under test by the Fawkes Automobile Company of Minneapolis and St. Paul, was brought to a stop at the Minneapolis garage before an interested crowd of spectators. The engine was apparently in excellent shape when it was brought to a stop Sunday night, after running over nine days continuously.

The performance of the Rambler was exceptional in the way of non-stop tests. It was on the road almost all of the time that the engine was running during the nine days, being driven through the night, in all kinds of weather. Only a small portion of the running was done under cover. Erne Simpson and Jesse Jennings were the drivers.

Severe snow storms, rain and sleet were encountered on several days. On the fifth day Jennings drove the car through a snow and sleet storm in the early morning, which forced him to stop twice to find his way. The engine suffered little, except that once or twice water collected on one of the spark plugs, and it was necessary to drain out water which had worked into the



THE THOMAS HIGH-POWERED RUNABOUT.

THOMAS PRESENTS POWERFUL RUNABOUT.

The new high-powered runabout by the E. R. Thomas Motor Company, of Buffalo, embodies the main features of design of that firm's touring cars, the differences being a special engine of high horsepower, set further back, the use of smaller wheels, a new design of frame and general fixture of pedals and levers.

The motor is of the four-cylinder water-cooled type, having five bearing crankshaft, the rear bearing being lubricated by a chain oiler. Lubrication of the motor is by a positive action pump with six sight feeds located in the dash. Four of the feeds lead to the cylinders, one to the shaft-driven fan and one to the crankcase. This oiler is operated by a shaft running from the rear end of the intake camshaft.

MARMON METHOD OF CRATING AUTOMOBILES.

As will be seen from illustration, the only criticism which might be brought against the manner in which Nordyke and Marmon crate automobiles, is that the work is too thoroughly done. The box is made to fit the car on sides and top, with just a little clearance at the ends. It is built up in sections with bottom spiked to two 4 by 6-inch skids, set in far enough to receive the weight of the car. The box is lined with tarred paper and is practically airtight and moisture-proof. The machine is so placed in the box that there is no side motion; a chock block is placed forward and back of each wheel; the axles are blocked up so that the weight is removed from the tires, and blocks are placed between the elliptic springs. Lamps, etc., are left attached to the car; spare parts are boxed, and extra tires, top, trunk rack, etc., are secured to the floor under the car.



RAMBLER NON-STOP CAR ENCOUNTERS SNOWSTORM, MAY 15.

Photo near Loring Park, Minneapolis. In the car are Erne Simpson at wheel; Jesse Jennings, assistant; E. G. Terwilleger, chief observer; L. H. Fawkes, proprietor Fawkes Auto Co., Minneapolis and St. Paul,

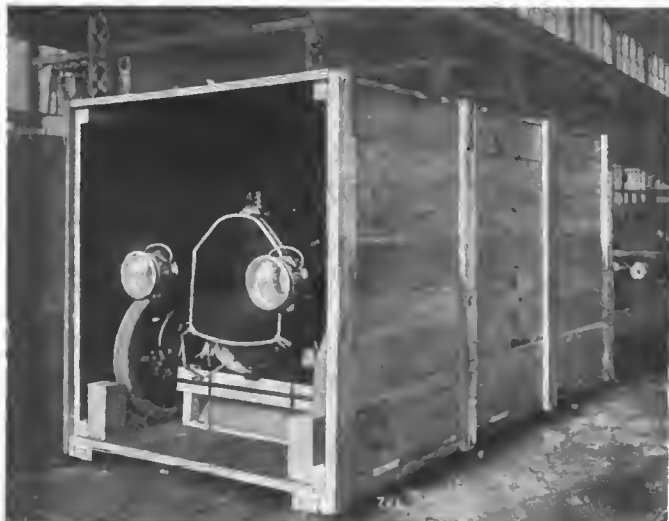
engine. A pounding in the cylinders became noticeable on the sixth day, giving evidence of carbon forming, but this disappeared when kerosene had been fed in through the carbureter. The engine continued to run smoothly, and oil used in unsparing quantities eased off every bearing and joint.

The engine consumed on an average of from 22 to 23 gallons of gasoline in the twenty-four hours. About ten round trips between the two cities were made each day, and in addition to this the work on city streets adds considerably to the mileage.

The car was under the eye of about fifteen observers, E. G. Terwilleger, president of the Reliance Elevator Company, and F. J. Kerner, manager of the Hartford Rubber branch, being among the chief observers. Storage batteries were changed twice, the connection being changed over to dry cells while the change was being made. No difficulty was experienced in making these changes.

GATES MILLS HILL CLIMB JUNE 8.

CLEVELAND, O., May 21.—Saturday, June 8, has been fixed as the date for the third annual hill climb of the Cleveland Automobile Club on Gates Mills Hill. Nineteen events are provided for, the entry fee per car being \$10, which must be sent in not later than June 3. The F. B. Stearns Company, of Cleveland, has challenged all comers for the record of the hill.



HOW THE MARMONS ARE SECURELY CRATED.

Car Company, Toledo, O., succeeding H. S. Leyman, resigned.

R. D. Aldrich has been appointed general sales manager of the Atwood Manufacturing Company, Amesbury, Mass. Mr. Aldrich was formerly connected with the Twentieth Century Company.

George E. Edmunds, of Edmunds & Jones Manufacturing Company, Detroit, Mich., has just returned from a two months trip to the Pacific Coast. Mr. Edmunds states he found trade conditions excellent and promising.

Harry Leyman, formerly assistant manager of the Pope Motor Car Company, Toledo, O., has been appointed sales manager of the DeLuxe Motor Car Company, of Detroit. Mr. Leyman entered upon his new duties the latter part of last week.

Robert M. Beck, long connected with the Pope Manufacturing Company as chief engineer, has gone to Hagerstown, Md., where the Pope-Fribune is manufactured, and also the Pope bicycles, the sale of which is greater than for several years.

P. L. Hussey has resigned from the Cambria Forge Company, Johnstown, Pa., and at present is located at 1115 St. Clair avenue, Cleveland. Mr. Hussey is one of the best known men in the industry, and after taking a short rest will likely connect himself with the trade again.

C. S. Carris, who with L. L. Whitman has twice broken the transcontinental record in a Franklin car, has just returned to Syracuse after completing a trip of upwards of 10,000 miles in a 1907 Franklin six-cylinder car. On this trip Mr. Carris has visited nearly all of the principal cities east of Chicago.

Owing to the promotion of H. E. Field to the position of sales manager of the Hartford Rubber Works Company, the position of branch manager at Detroit was left vacant, and C. W. Hatch, formerly with the Diamond Chain and Manufacturing Company, has been appointed to the position of local manager in that city.

C. C. Goodrich, general superintendent of the B. F. Goodrich Company, Akron, O., has announced that he will retire from the company about the first of next year and will remove East, probably to Orange, N. J. He has no plans for the future, but it is understood he will retire from active business. The death of his mother, the widow of the late Dr. B. F. Goodrich, founder of the rubber industry of Akron, through which Mr. Goodrich comes into a fortune of a million or more, is the cause of his severance from the company. His resignation follows that of J. F. Kelley from the same company, he, like Mr. Kelley, to enjoy their fortunes rather than keep closely confined to business.

NEW TRADE PUBLICATIONS.

A neat folder has just been issued by the Peerless Motor Car Company, with eight finely engraved plates of Model 15, 45-horsepower, and Model 16, 30-horsepower, 1907 Peerless cars. These represent the eight principal types of modern automobiles, the four and seven-passenger touring car, the racy roadster, limousine, coupé, cape-top roadster, berline and demi-limousine and hansom.

A catalogue is just off the press dealing with Hill precision oilers for automobiles, motor boats and other machin-

ery. Half-tones of the complete oilers and sectional line drawings of the mechanism are features of the booklet. Hill precision oilers are manufactured by the Precision Appliance Company, 832-840 Austin avenue, Chicago.

A very complete catalogue of more than ordinary elegance and care in get up has been sent forth by the Stewart & Clark Manufacturing Company, of Chicago, descriptive of the 1908 model of the Stewart speedometer. Numerous half-tones illustrate the complete indicator and its various component parts. A copy of the booklet will be forwarded to any address upon request.

Charles E. Miller, 97-101 Reade street, New York, has produced his 1907 catalogue of parts, fittings and sundries for automobiles, motor boats and motorcycles. As usual it is a voluminous affair of more than 200 pages, comprising every known article in the automobile industry. An edition of sixty thousand has been printed, and a copy can be obtained free on request by any automobilist.

INFORMATION FOR AUTO USERS

Hopewell Tire Case.—This case is a continuous casing wrapping round the tire to protect it from water, dust and grease. The case is made of the highest grades of both enameled drill and artificial leather, fastened at one end with a



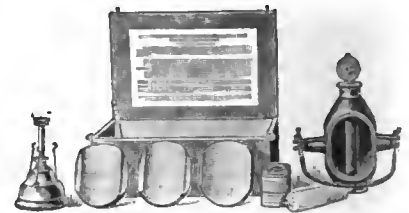
THE HOPEWELL TIRE CASE.

metallic cable and at the other with a cord, which are tightened and fastened, as shown in illustration. The metallic cable is covered by a braid and treated with a moisture-proof compound. Inasmuch as the inner diameter of the tire case does not have to pass over the outside diameter of the tire, the inner portion of the tire case is made a perfect fit and has not the customary wrinkled appearance. Hopewell Brothers, 42 Osborne street, Cambridge, Mass., are the manufacturers of the tire cases.

The Latest Winchester.—A speedometer with the high-speed-record-hand is the latest product of the Winchester Speedometer Company, 1557 Broadway, New York. The auxiliary, or maximum hand, red in color, is carried by the regular indicating hand to the highest speed attained by the car and remains there when the car slows down or stops. A touch of the resetting button, which, incidentally, is

within easy reach of the chauffeur's foot, releases the maximum hand, which instantly falls back to the speed the car is then making and remains there when the car stops. The advantage to the autoist who has been summoned by the constable to stop is obvious. There is no advance in the price of the new models incorporating this device.

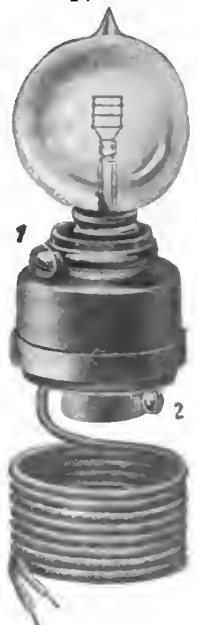
The Little Wonder Vulcanizer.—Louis E. Rice, Cedar Falls, Ia., is the patentee and manufacturer of a handy portable vulcanizer which it is claimed is the only one in existence, apart from factory plants, having detachable plates which will vulcanize tires on or off the rim



RICE'S LITTLE WONDER VULCANIZER.

and leave the tire the proper shape after the repair is made. The Little Wonder Vulcanizer weighs only 3 1-2 pounds and occupies so little room that it is very easily carried on any automobile. By its use the repair of a bad cut on an outer case or an inner tube can be made in about thirty minutes.

Electric Auto Lamp.—An ingenious electrical device has been placed on the market by the Royal Battery Company, of New York, consisting of a novel form of an electric lamp and an attachment which fits the gas pipes of the standard headlights and gas lamps having a 3/8-inch pipe. A number of filaments burn in a parallel simultaneously, each filament giving about four candle-power on six volts. If one filament should burn out or break, three would be left to give service. The socket or attachment also presents a new feature. It has a set screw at the upper part which tightens the bulb and makes unscrewing, owing to vibration, an impossibility. The lamp itself is fed from the ignition storage battery or dynamo. Specially treated filaments are used, and it is claimed that the lamp will last for 250 to 300 hours before it will burn out. No tools other than a screwdriver are needed for installing the apparatus; two lamps can be put in position in three minutes. A further advantage of the system is that the attachment is interchangeable with the gas system. The National Sales Corporation of 296 Broadway, New York, is selling agent for the apparatus.



ROYAL MULTIPLEX LAMP.

THE AUTOMOBILE



Through the Picturesque Country of the Four By A. G. Batchelder

WE covered the strikingly scenic sections of the big A. A. A. tour under the most unfavorable conditions that could exist. In July the mountain roads will have improved to a marked degree. Rain had preceded our coming and the heavens still had some left. Chains were a requisite and the low-hung top shut out miles of picturesque country.

But the quintette in the Pierce "Pathfinder" thoroughly enjoyed the journey over the rugged mountains of Pennsylvania and keenly admired the less strenuous climbs of the green hills of Maryland. Despite the cussed waterbars that punctuate the way, and the wet that added a source of unnecessary discomfort, we five unanimously voted that the Pittsburg-Bedford and Bedford-Baltimore runs will prove to be the best remembered and appreciated sections of the event for the Glidden and Hower trophies.

Naming the occupants of the sturdy car that carried us so resolutely and uncomplainingly, I am inclined to place the pilot first in the list, for if "Teddy" Dey had not handled that "Big Six" with such consummate and untiring skill there would have been no opportunity for Touring Board Committeeman "Phil" Flinn to assist Secretary Dai H. Lewis in preparing the details of the route, nor would Spooner have had the chance of photographing incessantly from dawn until dusk. It's a job to sit at the wheel of that road locomotive during the sunlight hours of a day, especially when the way winds up to the clouds and down again, abruptly swings around unexpected turns, includes slimy, treacherous surfaces, and now and then demands consideration quickly for other users of the highway.

There'll be some tired drivers at the conclusion of that 100-mile trip from the dirty, soot-laden haze of Pittsburg to the emerald-carpeted and shady dell at Bedford. But the task will bring a scenic recompense of surpassing beauty, sublime and inspiring, and none will regret that climb of the Alleghenies, though sweet and well-earned will be the rest over Sunday at inviting Bedford, a resort with a history that traces back fifty years.

Because the "Pathfinder" had found roads in Ohio that did not deserve even the slightest designation as such—and Committeeman Flinn will have to try again for an itinerary between Canton and Pittsburg—the big car did not report at the Hotel Schenley on Tuesday night. I was one of Arthur Banker's party that started out Wednesday morning to meet and escort the delinquent into the city. Just before we reached the Ohio line we learned, much to our chagrin, that the sought-for had eluded us by taking an unexpected route into town. Next day the energetic Banker, in company with Paul C. Wolff, secretary of the Pennsylvania Motor Federation; S. C. Garver, and "Tom" Dunn and "Bob" McCurdy, two of the Banker star demonstrators, guided us out of the smoky atmosphere to the city's limits, through Wilkinsburg, then down the serpentine hill into Turtle Creek, home of Westinghouse, and bade us godspeed at East McKeesport.

Rain was now falling, but chains had been put on and the top raised, and, hopefully, we started for the mountains and beyond. Stewartsville, Circlesville and various other villes fell to the rear, one after another, as the mechanical brute ploughed its way over and through the mushy roads. A mile of brick pavement in Irwin seemed a treat, and again in Greensburg we had a similar delight. Beyond Youngstown we struck the Loyalhanna creek



JUST BEFORE THE ESCORT LEFT US AT MCKEESPORT.

and followed its banks and the Chestnut Ridge for several miles. Beyond Ligonier we began the climb of the Laurel Ridge, rocky and likely to give the passengers of a tonneau some exercise. On the summit the going was better and in the descent the road improved considerably.

At Stoyestown Station we were at the west foot of the Allegheny mountains, and there started a ten-mile dig to the summit. At the base the trees were rich with foliage, but as we progressed skyward the green took on a lighter shade, and, intermingled with the lasting evergreens, it gradually presented a more delicate appearance until by the time the summit was reached it had disappeared entirely and the trees stood out gaunt and unadorned. Even the early dogwood had succumbed to the tardiness of Spring. A dense fog had settled down upon the mountain tops and we poked along slowly and cautiously, not knowing at what moment something might emerge from the pall that shut out the grand view that will be visible in July. Of course, the waterbars were in evidence—repeatedly crossing the road and repeatedly making one cuss the man who was responsible for their placing. Occasionally we caught glimpses of old stone and log houses, most of them uninhabited and more or less in ruins. Frequently we met lumber wagons, usually drawn by three teams of horses, and occasionally attached to traction engines.

Whenever the horses betrayed trepidation at the appearance of the unusual occupant of the road, "Phil," the horse tamer, tackled the task of subduing the fractious equines. His sonorous voice was as efficacious as Mrs. Winslow's soothing syrup is supposed to be for youngsters. Only once was the kindly aid of Mr. Flinn unrewarded, and that happened the next day and it carries a story with it, one that even now exasperates us.

From the summit to Shellsburg it was a nine-mile slide down the mountainside, with a series of ridges interrupting. First came Wolfsburg, and a couple of miles farther on was Bedford,



BESIDE THE RAYSTOWN BRANCH OF THE JUNIATA RIVER.



THEN WE PLUNGED TOWARD THE ALLEGHENIES, DESPITE RAIN.

where we put up at the Grand Central for the night. The Bedford Springs Hotel, two miles out of the city, had not been opened for the season, much to our subsequent regret.

Early the following morning we were again ready for the fray, though the overcast sky with its heavy rain clouds was not conducive to exuberant spirits. An inspection was made of the Springs hotel, its manager interviewed, and the place was O.K.'d as being a satisfactory stop for over Sunday.

On our way, we were soon in the valley of the Raystown branch of the Juniata, which with the sun lending its light and warmth will present as pretty a panorama of scenery as one could ask for. Fifteen miles had been traveled before we started the climb up Ray's Hill, which was much easier than the ascent and descent of Sideling Hill. Next came a ridge without a name, and then we negotiated Scrub Ridge, and three miles from its base ran into McConnellsburg. Soon after leaving McConnellsburg came a four-mile effort to the summit of Tuscarora Mountain. It was a road that alternated between bad and good, but possessed of those instruments of automobile torture known as waterbars. Still it seemed much easier in descending the three and a half miles, and gradually the pike improved in quality, and life was once more worth living, despite the beginning of the toll-gates, as we sped onward through Mercersburg, Greencastle and across the State line into Maryland, and were soon in bustling Hagerstown. Here we ran across Harold L. Pope, seated at the wheel of a Pope-Tribune, who was leaving in the evening for his new post at Toledo.

A Crawford demonstrator gladly guided us out of town. At Boonsboro, near which the battle of Antietam was fought, we started the crossing of the Blue Ridge. Less trying than the Alleghenies, the ridge supplied view after view of scenic beauty and possessed a roadbed superior to what had been traveled over in Pennsylvania. At Boliver we found ourselves on the other side



BEDFORD SPRINGS WILL SUPPLY A GOOD RESTING PLACE.



ON THE SUMMIT OF THE ALLEGHENIES, WE FOUND THE TREES STILL GAUNT AND BARE.

of the ridge, but we were still considerably above sea level, and from Braddock Heights, five miles before reaching Frederick, a sight of four States was possible. The "clustered spires of Frederick" were visible, and even the mountains of Virginia were to be seen far in the distance.

It was not far from Frederick that "Phil, the Horse Tamer," met with his single reverse in the way of appreciated courtesy. Noting the apprehension of a single rig that was approaching, "Engineer Teddy" hushed the noise of the big car and allowed it to coast down hill silently. The "Horse Tamer," who had sprinted ahead, took the bridle of the excited horse and led him past the car, despite the ungenerous comments of its owner. It is true that we exchanged compliments of a somewhat emphatic sort, and the parting shout of the stranger had something to say about "'tendin' to our case." As we drew into Frederick and stopped in front of the City Hotel, seeking information as to a gasoline replenishing place, a deputy sheriff and then the sheriff himself interviewed us in regard to the incident some eight miles back on the road. At first there seemed to be an inclination to cause us to await the coming of the horseman who had in mind the swearing out of a warrant for our arrest on the ground that we had caused some fancied damage to his rig. A plain statement of the case as it actually existed, a telephone conversation between the sheriff and the alleged plaintiff, and we were released from the alleged custody which was supposed to exist but which we declined to recognize except as a matter of courtesy. As a clincher, Spooner had taken a photograph as the horse was being led by in charge of our "Tamer." It was the single incident of unfriendliness that had been encountered on the way from Pittsburg.

For those who may have in mind the seeking of the house from the attic window of which Barbara Frietchie waved her country's flag, it should be here stated that the domicile is no longer in existence, though Dame Barbara's grave can be found in the cemetery, wherein Francis Barton Key, composer of the "Star-Spangled Banner," was also laid to rest. Frederick also gains celebrity through

being the birthplace of Admiral W. S. Schley.

The Frederick-Baltimore Pike is a pretty fair sort of road, and while one continues to cuss the waterbars, they are less troublesome than in Pennsylvania. A few miles from Frederick you cross the Monocacy river by the Old Jug bridge, built in 1808. Though we could have made Baltimore, we stopped for the night at Ridgeville and found good country accommodation at the Eagle Hotel. Our reason for lingering 31 miles from Baltimore was for the purpose of entering that city by daylight and being sure of the best route. Mr. Clark met us at Ellicott City, which is picturesquely located on the Patapsco river, and we were soon in front of the new Belvidere Hotel, where the tourists will stop on the night of July 22.

From Pittsburg to Baltimore exists the real picturesque and scenic part of the coming A. A. A. tour, and while the route is far from easy sledding, and will try the reliability of cars and the skill of drivers, there will be a welcome relief from the level roads of Ohio, Indiana and Illinois, a change from the monotonous succession of busy cities and sleepy villages—in fact, it will take one close to Nature, who exhibits her moods in variable forms in the miles that intervene between grimy Pittsburg and cleancut Baltimore. There is little in this world worth having unless it is fought for, and it must be admitted that there will be work for cars and drivers, but work that is within the capacity of both and well worth the scenic rewards that will be forthcoming. Springs and brakes and tires will be severely tried, and before leaving Pittsburg the wise participant will have reckoned with these items and be prepared for what will follow.

PIERCE PATHFINDER'S WORK IS DONE.

The Pierce "Pathfinder" reached New York City, Monday night, shortly after 6 o'clock, and Secretary D. H. Lewis had completed the mapping of the 1,500-mile tour, with the exception of a stretch between Canton and Pittsburg. The route covered between these two cities was found impossible for recommenda-



MANY TIMES PATHFINDER STOPPED TO HAVE HORSES LED PAST ITS SILENT CYLINDERS.



FREQUENTLY WE FOUND ROAD REPAIRERS AT SPRING WORK

tion, and Philip S. Flinn, the Pittsburg member of the Touring Board, will prepare another itinerary.

The tour will start from Cleveland, July 11, the first day's run being to Toledo, 121 miles; second day, Toledo to South Bend, 166 miles; third day, South Bend to Chicago, 101 miles. The tourists will rest in Chicago from Saturday night to Tuesday morning. South Bend will be reached on Tuesday night; Wednesday will be a run of 148 miles to Indianapolis; Thursday the route calls for 174 miles to Columbus; Friday will be occupied in reaching Pittsburg, and the following night the tourists will stop at Bedford Springs for over Sunday. Monday, July 22, will come the long run of 140 miles to Baltimore; from this city to Philadelphia, the century of Tuesday, will not be very difficult, and the final day's run from Philadelphia to New York should not be particularly trying for the survivors.

Chairman F. B. Hower, who met the party of "Pathfinders," expresses himself as confident of the great success of the tour, for which he anticipates an entry list of a hundred or more for the two trophies.

N. J. COMMISSIONER TO INVESTIGATE RUN.

TRENTON, N. J., May 27.—J. B. R. Smith, Commissioner of Motor Vehicles of New Jersey, has taken prompt action in the case of the automobile smash-up which occurred near this city last Saturday night, when four men were seriously hurt as a result of speeding their car on an alleged record run from New York to Philadelphia. The Commissioner says that if he finds it to be correct that the men were employed by the New York branch of the Packard company to race the car through New Jersey, he will proceed against the company for violation of a State law, expecting at least to revoke its license in this State.

MEETING OF A. A. A. EXECUTIVE COMMITTEE.

The monthly meeting of the A. A. A. Executive Committee was held Tuesday afternoon at the Association offices, 437 Fifth avenue, New York City. President William H. Hotchkiss



PICTURESQUE SPOTS EXIST ALONG BALTIMORE-FREDERICK PIKE.

presided, others present being First Vice-President L. R. Speare, William K. Vanderbilt, Jr., George E. Farrington, Jefferson DeMont Thompson, A. G. Batchelder and Secretary F. H. Elliott. Chairmen Charles Thaddeus Terry of the Legislative Board, Frank B. Hower of the Touring Board, Robert P. Hooper of the Good Roads Board, and Mr. Thompson of the Racing Board all presented reports indicating the present substantial activities of the national organization. The Automobile Club of Washington was admitted to membership as a State association, its territory to include the District of Columbia.

C. R. MABLEY TO MANAGE IMPORTERS' SHOW.

Carlton R. Mabley has been selected as general manager of the Importers' Automobile Salon, and will take charge of the show of foreign machines in Madison Square Garden at the end of the year. The announcement was made at a dinner given to Mr. Mabley at the Café Martin by members of the New York Automobile Trade Association.

Among those present were: Paul Lacroix (Renault), Carl Page (White), Frank Eveland (Stevens-Duryea), E. R. Hollander (Fiat), E. S. Partridge (C. G. V.), A. J. Pickard (Stearns), Alfred Reeves (A. M. C. M. A.), J. S. Josephs (Rochet-Schneider), John F. Plummer (Locomobile), S. B. Bowman (Clément-Bayard), W. M. Harradon, Peter Fogarty, W. P. Kennedy, A. G. Hamilton, A. F. Camacho, L. P. McNamara, J. A. Coch, G. A. Hewitt, and C. Andrade.

In the course of the evening it was stated that the firm of Smith & Mabley would be discontinued.

A. L. A. M. INSTITUTES MORE NEW ACTIONS.

Following up the policy of beginning actions against independent makers and dealers recently inaugurated, the Association of Licensed Automobile Manufacturers has just filed four additional suits against the Mors Motor Car Company, the Daimler Manufacturing Company, Oscar Lear Automobile Company and the York Motor Car Company.

ENTRIES TO DATE 1907 A. A. A. TOUR.

Car No.	Entrant.	Club.	Car.	H. P.	Glidden.
1	N. H. Van Sleklen.....	Chicago Automobile Club	Apperson	40-45	Yes
2	K. R. Otis.....	Cleveland Automobile Club	Pierce Great Arrow	60-65	Yes
3	R. D. Garden.....	New York Motor Club	Pierce Great Arrow	40-45	Yes
4	Maxwell-Briscoe Motor Co.....	Westchester Motor Club	Maxwell	36-40	
5	A. L. Kull.....	New York Motor Club	Dragon	24	Yes
6	T. J. Clark.....	Chicago Automobile Club	Packard	30	Yes
7	C. A. Coey.....	Chicago Automobile Club	Thomas "Flyer"	60	Yes
8	Charles E. Finlay.....	Associated Automobile Clubs of N. J.	Pierce Great Arrow	60-65	Yes
9	George S. Salzman.....	Automobile Club of Buffalo	Thomas "Flyer"	60	Yes
10	The Dragon Automobile Co.....	Philadelphia, Pa.	Dragon	24	Yes
11	Montgomery Hallowell.....	Automobile Club of Buffalo	Thomas "Flyer"	60	Yes
12	R. D. Chapin.....	Automobile Club of Detroit	Thomas "Forty"	40	Yes
13	George M. Davis.....	Automobile Club of Buffalo	Thomas "Flyer"	60	
14	Philip S. Flinn.....	Pittsburgh Automobile Club	Pierce Great Arrow	40-45	Yes
15	H. P. Branstetter.....	Chicago, Ill.	Dragon	24	Yes
16	Orrel A. Parker.....	Automobile Club of America	Royal Tourist	45	Yes
17	H. E. Coffin.....	Automobile Club of Detroit	Thomas "Forty"	40	Yes
20	John Kane Mills.....	Chicago Motor Club	Pierce Great Arrow	40-45	Yes
18	H. Paulman.....	Quaker City Motor Club	Dragon	24	Yes

HOW THE AUTOCAR WON THE 24-HOUR RACE

PHILADELPHIA, May 25.—Autocar, first; Frayer-Miller, second; Dragons, third and fourth; Mitchell, fifth. That was the order of finish as announced by the officials in the big 24-hour Endurance Derby, which was concluded at 4:13 P.M. This order may be changed somewhat, as the Frayer-Miller, which, secure in its position from a mileage standpoint, had been withdrawn in the last hour, when its ignition apparatus had gone wrong, was pushed under the wire at the finish by control attendants. Quick to seize the opportunity, the Dragon people filed a temporary protest with Referee Overpeck on the ground that the contest, being one of endurance and not of mileage, the Frayer-Miller should be disqualified for not having been on the track for the full twenty-four hours. The impression prevails, however, that the ruling may be based on mileage, and that the air-cooled car will retain second place.

The mileage of the five cars which finished is: Autocar, 791; Frayer-Miller, 736; Dragon, 733; Dragon, 686; Mitchell.

Another incident of the finish which might have resulted awkwardly for the winner but for the thoughtfulness of a local newspaper man, was the withdrawal of the Autocar from the track when its lead was such that in the limited time remaining it became apparent that it could not be headed. Six minutes before the time limit set for the conclusion of the race a courier from the press stand dashed into the Autocar control and warned them to get the car on the track. The result resembled an alarm at a fire station. Resting drivers jumped into their coats; attendants took a hurried look over the car, "threw 'er over," and in two minutes the Autocar was chug-chugging around the track to the plaudits of 3,500 spectators.

Ten cars lined up to take the word from Referee Overpeck. They were:

C. A. Schroeder's 40 to 60-h.p. Darracq, driven by Wm. Wallace, Jr.

W. M. Cram's 35-h.p. Mitchell, driven by H. F. Greenwalt and Edwin Yost.

H. B. Stillman's 18-h.p. Mercedes, driven by himself.

Dragon Automobile Co.'s 24-h.p. Dragon, driven by George McKay and T. F. Randolph.

The same company's 24-h.p. Dragon, driven by Edward O'Donnell and John Haynes.

The Autocar Company's 30-h.p. Autocar, driven by Joseph L. Brown and Robert Maynes.

T. M. Twining's 40-h.p. Crawford, driven by himself and R. S. Crawford.

Philadelphia Motor Car Co.'s 50-h.p. Frayer-Miller, driven by Daniel Webster and W. H. Knepper.

Ralph Mongini's 60-h.p. Matheson, driven by himself.

Girard Motor Car Co.'s 30 to 35-h.p. Cleveland, driven by George Ruhland and M. La Roche.

Starter "Joe" Keir fired his pistol at exactly 4:13 o'clock, and then started a fight for the lead between Mongini and Crawford, which put their cars several miles ahead of the others at the end of the first hour, and which saw the old automobile manufacturer gain more than a mile on his big Italian adversary, incidentally raising the hour figures for a similar event from 41 to 44 miles. Comparison is made with the figures made by the Soules brothers at Columbus, O., July 4, 1905.

The end of the second hour saw the Frayer-Miller in the lead with 84 miles, one better than the Soules record. There was nothing more doing with the records until the completion of the fifth hour, when "Dan" Webster and the Frayer-Miller, still in the lead, added a mile to Soules' 198. Again at the seventh hour the Frayer was a mile better than the Soules record of 275, and from then on to the sixteenth hour—when the leader had covered 560 miles, seven better than the record (changing the card for all the intermediate hours also), and when Webster had a 20-mile lead on the nearest car—things had a decided Frayer-Millerish aspect.

Just here, however, a dump into the backstretch ditch and resulting magneto trouble lost the Frayer nearly all its lead, and early in the eighteenth hour it was passed by the Autocar, which secured a lead of over 30 miles before the Frayer got going once more. This lead was too much to overcome, and the Autocar crew, "playing 'em safe," took no chances, although a continuance of the Frayer's misfortunes rendered such caution unnecessary and widened the margin between the cars to 55 miles at the finish.

The ditching of cars, especially on the backstretch, was quite frequent during the race, fully half a dozen spills of this character causing cars not only to lose much valuable time, but in several instances put them out of the race. The Mitchell was the first to buck the rail, just about dawn on Saturday. Then came the Frayer's mishap. The Cleveland lost second position when, shortly before midday, it carried away six sections of the backstretch rail and plumped into the ooze, later withdrawing with 544 miles to its credit. A few minutes later one of the Dragons—No. 5—burst a tire and turned a complete somersault as it penetrated the fence at the first turn beyond the grandstand.

Strange to say, none of these spills produced a serious injury. Scratches and bumps are plentiful, but the Methodist Hospital ambulance, which remained on the ground during the race, had its trouble for nothing.

The Dragon mix-up gave the public an opportunity to admire the perfect arrangements made to cope with just such accidents. The car was towed back to the Dragon quarters in a most dilapidated condition. Thirty men set to work on it at once, and in



LINE-UP OF THE TEN CARS THAT STARTED IN THE 24-HOUR RACE AT POINT BREEZE TRACK, PHILADELPHIA.

an hour and fifty minutes No. 5 was back on the job—in time to prevent the Mitchell from pre-empting fourth place.

Mongini's car, a hopeless victim of ignition troubles, was taken from the track after covering 130 miles, much to the grief of its driver, who had prepared to run the car alone through the entire race, not caring to divide the honors he was sure would be his. The Crawford suffered from the same ailment, but hung on till after daylight, having 389 miles to its credit when finally withdrawn. The smashing of a clutch roller put Stillman's five-year-old underpowered Darracq to the bad, but when it was retired it had covered 485 miles and was in fourth position.

A surprising feature of the contest was the large crowd of spectators who found time to stay all night to witness the novel scenes in the various camps and on the track.



THE 30-H.P. AUTOCAR WHICH WON THE 24-HOUR.

The following table shows the leading car at the end of each hour, with the number of miles to its credit:

Hour	Leader	Miles	Hour	Leader	Miles
1	Crawford	44	13	Frayer-Miller	469
2	Frayer-Miller	84	14	"	498
3	"	123	15	"	529
4	"	155	16	"	550
5	"	199	17	"	579
6	"	231	18	Autocar	609
7	"	276	19	"	641
8	"	307	20	"	658
9	"	349	21	"	703
10	"	378	22	"	738
11	"	409	23	"	769
12	"	440	24	"	791

The fillers-in proved to be a farce. The curtain-raiser, a three-mile event for cars costing \$1,500 or less, brought two Model C Jacksons to the tape. The time trials for the track record were abandoned, the only possible entrants being too busily engaged tuning up for the big event to bother about them. The condition of the track after the conclusion of the twenty-four-hour race was such that the officials warned all starters that to attempt fast time on it would be a very risky undertaking. As a result, but one event was started, and in that but two cars—a Pope-Hartford and an Oldsmobile. The former won in slow time, the latter suffering a puncture.

YALE STUDENTS HOLD RACE MEETING.

NEW HAVEN, CONN., May 27.—Six events were contested at the Yale Automobile Club's second meet at Bradford Driving Park, summaries of which are as follows:

Three-mile Open, Autos.—A. Folberth (Oldsmobile), 4:25 3-5; L. C. Phipps (Stoddard-Dayton), 4:29; Walter Allen (Dietrich), 4:35.

Three-mile University, Autos.—L. C. Phipps (Stoddard-Dayton), 4:32; W. J. Morden (Berliet), 4:33 4-5; G. H. Townsend, 4:47 3-5.

Three-mile Small Car Open.—Charles S. Lee (Franklin), 4:41 4-5; R. G. Bigelow (Locomobile), 4:42 1-5; C. Bether (Franklin), 4:43 4-5.

Three-mile motorcycle races were decided as follows: Two-cylinders, E. L. Johnson, 5:13 3-5; single-cylinders, P. Cox, 4:52 3-5; university race, E. Coe, 5:33 4-5.

ENTRIES FOR 200-MILE ENDURANCE RUN.

Preparations are well advanced for the New York Motor Club 200-mile endurance run on June 6. Carl Page has consented to act as pilot and will distribute the confetti from his White steamer. Patrol service will be done by a Berliet machine supplied by the American Locomotive Company, and by William B. Hurlburt's Packard. F. J. Wagner is to act as starter, and Oliver A. Quayle, president of the New York State Association of the A. A. A., will check the cars in at Albany. Secretary Hakes, of the New York State Association, will be the Chatham checker. Others to act in this capacity are Chas. Dieges, of the Timers' Club of New York, M. C. Reeves, E. L. Ferguson, C. A. Woolson and Louis R. Smith. The interests of the tour will be looked after in Philadelphia by E. C. Johnson, of the Quaker City Motor Club; similar service will be rendered in Harrisburg by W. R. Douglass.

Among present entries for the tour are a 40-horsepower Berliet engaged by James Joyce, of the American Locomotive Company, two Dragons engaged by A. L. Kull and John Haines, a 40-horsepower Lozier by H. A. Lozier, and a 30-horsepower Franklin entered by Wyckoff, Church & Partridge. It is hoped that entries will be made as early as possible to facilitate preparations.

FURTHER ACTION ON THE PIER QUESTION.

Following out the systematic move undertaken by the American Motor Car Manufacturers' Association, through its general manager, Alfred Reeves, to overcome the opposition of certain steamship lines to the gasoline commercial vehicle, there was a meeting last week with the Local Freight Agents' Association of New York City, the New York Automobile Trade Association delegating its secretary, E. V. Stratton, to co-operate. L. B. Sanders, in charge of the new motor car department of the Fiss, Doerr & Carroll Company, also attended. The freight agents are entirely in accord with the trade associations on this point, even having gone to the extent recently of passing a resolution favoring the admission of gasoline trucks to the docks. The next step will be to bring the matter before the Trunk Line Association, and through the latter to the fire underwriters.

TRADE ASSOCIATION INCORPORATES.

At a meeting of the board of directors of the New York Automobile Trade Association in the latter's new quarters in the Motor Mart at 1931 Broadway, last week, the matter of organizing the association as a corporation under the laws of this State was taken up and completed. The Haynes Automobile Company, A. G. Southworth Company, D. P. Nichols & Co., and C. B. Rice, who handles the Baker electrics in this territory, were admitted as members. Matters of interest to the trade, such as the question of holding an automobile sale week, and the refusal of some of the steamship companies to allow gasoline trucks to run on their piers, were taken up and discussed. A proposal to establish a collection department for the benefit of the members of the association was also considered.

STEARNS TO BRING OUT A SIX-CYLINDER.

For the season of 1908 the ranks of the six-cylinder advocates are to have a new entrant in the shape of the F. B. Stearns Company, of Cleveland, O., who have decided to place a high-powered model of this type on the market for next year. No details as to its chief features are as yet forthcoming, though it is stated that a number of new ideas will be incorporated, as well as the fact that they are such as to make the six-cylinder car more popular. Owing to the press of other work at the factory the new car is not expected to be seen much before December next. The first order for a six-cylinder Stearns has already been placed, however, and calls for delivery January 1, 1908.

FEATURES OF RENAULT AND PANHARD RACERS

THE three Renault machines which will endeavor to again capture the Grand Prix of the Automobile Club of France are in all essential features similar to those of last year, the only changes being in minor details. They are, in fact, an enlargement of the 1907 models of Renault touring machines.



NEW RENAULT RACER HAS VERY FAMILIAR APPEARANCE.

Distinctive features of the racer are radiator behind the motor, tread exceptionally narrow, and absence of a differential. As to the mechanism of the racer there is nothing of an extraordinary nature or that could in any sense be considered as freakish. The placing of the radiator in the rear has numerous advantages; the motor is more accessible, the machine gains in elegance, and there is a diminution of the weight on the front axle, as the result of which there is better adherence of the driving wheels and more efficient utilization of the driving power. The relieving of the front axle gives excellent results on sharp turns. It is only with the radiator in the rear of the motor that thermo-syphon water circulation can be satisfactorily adopted. The abolition of the pump cannot be regarded otherwise than as a progress, for it simplifies the mechanism. It is interesting to note that last year's Grand Prix racers showed no signs of overheating under thermo-syphon circulation. The Renaults of the Auvergne circuit and the 1905 Vanderbilt, which were equipped with a pump, overheated enormously. The radiator, as is well-known, consists of a number of vertical tubes of small diameter with space between them for the passage of air. First adopted on the Paris-Berlin voitures, the system has now been developed to a perfect condition.

Four cylinders cast in pairs, bore 6.4 inches and stroke 5.9 inches, are announced as developing 100-horsepower; in reality the effective power is considerably in excess of this. Valve mechanism is as on the touring machines, a single camshaft operating valves all on one side. Although the Grand Prix is run with a limited allowance of fuel, the standard carbureter, with the improvements embodied in the 1907 touring machine, is employed. Ignition is by high-tension Simms-Bosch magneto with Renault mica spark plugs.

An inverted cone clutch is used on the three racing machines. The female member is cut in several places, forming a number of blades turned inwards, providing progressive friction on the male cone. Three speeds and reverse are obtained by sliding-

gear transmission, with direct drive on the high gear. The designers of the machine declare that the abolition of the differential is justified by the speed at which the car is intended to travel. At high speeds the wheels of a racing car frequently leave the ground. With a differential, when one wheel has left the road the other loses its propulsive action; thus for racing purposes the rear axle without differential is more efficient than one fitted with this organ.

Neither oil nor gasoline are under pressure on the racers. Renault liquid shock absorbers are employed, and it is very probable that Michelin dismountable rims will be used.

It is difficult to recognize the familiar Panhard in the three powerful racers produced from the Paris pioneer factory, for competition over the Dieppe circuit. Instead of a honeycomb radiator across the fore end of the chassis, this organ is now to the rear of the engine, about midway on the length of the frame. It is the position inaugurated by Renault, followed by Bayard-Clément on their cab chassis, and now taken up by Panhard. The four separate steel cylinders with copper jackets are 7.2 inches bore by 6.6 inches stroke, the largest displacement of any European machine in the race. Cylinder heads and valve pockets are of cast iron. Valves are on opposite sides, with integral cams. Ignition is by high-tension Eiseman oscillating magneto mounted in front of the engine on the forward cross member, and gear-driven off the camshaft. Spark plugs are on the sides, immediately over the inlet valves. Water circulation is assured by a centrifugal pump, the honeycomb radiator being of the type generally employed on Panhard machines. Owing to its new position a square opening has to be cut through it to allow of the passage of the steering column. A Krebs carbureter, with perpendicular currents and hydraulic regulator is employed, and is located on the right-hand side of the engine. All four exhausts are united in a common manifold, opening to the air



PANHARD MACHINE WITH MANY NEW FEATURES.

from a longitudinal pipe under the frame. Transmission and final drive show fewer changes; a Hele-Shaw multiple disk clutch as formerly; four speeds forward with reverse by separate lever, and cardan shaft to rear live axle. Krebs shock absorbers are used on all the racers; R. B. F. ball bearings are employed throughout in the transmission, and Michelin tires and dismountable rims have been adopted.

NEW YORK STATE "BLUE BOOK" ISSUE.

This week the Class Journal Company, publishers of THE AUTOMOBILE, issue the second volume of the 1907 series of the "Official Automobile A. A. A. Blue Book." This volume, which is No. 1 of the series, deals primarily with New York City and State, with a Canadian section, also with extensive routes into the Middle West. It is a book of 637 pages, illustrated with a large number of route maps, and in the neighborhood of 140 city and town maps, giving principal entrances and exits.

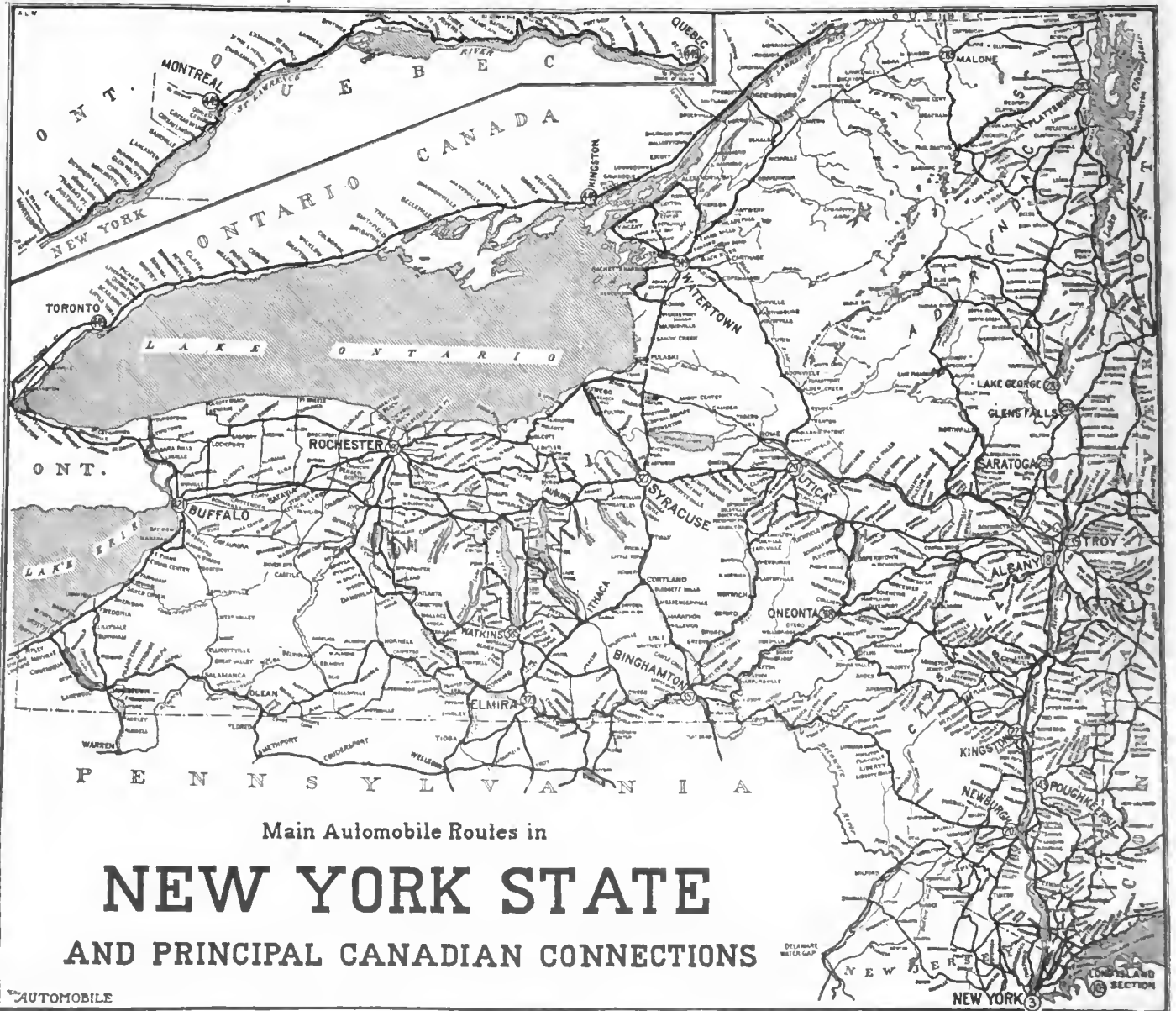
The accompanying map is a reduced reproduction of the New York State map in the front of the "Blue Book." In addition to New York State, it shows the principal connecting routes into New England, northern New Jersey, and upper Pennsylvania, also the Canadian route from the principal New York State waterway—Niagara Falls—to Hamilton, Toronto, Kingston, Montreal, and Quebec, with additional connections across the St. Lawrence from Thousand Island points and Ogdensburg to the route along the upper shore of Lake Ontario, connecting eastward to Montreal and Quebec, westward to Kingston, Toronto, and Hamilton.

The circles at the location of the most important cities represent centers of sections in the New York State volume listing *outbound* routes. The figures inside the circles represent the pages in the Blue Book where the title page of the different sec-

tions will be found, this map serving as a "graphic index" to the principal contents of the volume. For instance, the circle for Albany, N. Y., contains the figure "181;" turning to page 181, the tourist has the table of contents for the Albany section spread out before him. The same applies to all the other sections of the volume including the Canadian centers, Toronto, Montreal and Quebec.

For the first time the "Blue Book" has extended its compilations and map work into the West, the last seventy-five pages dealing with the principal through routes in Ohio, Indiana, and Illinois, with one route from Chicago to Milwaukee, Wis. Of course, the Western routes are fragmentary at this time, but Cleveland, Toledo, Detroit, Jackson, South Bend, Chicago, Milwaukee, Elgin-Aurora (Ill.), Indianapolis, Louisville, Cincinnati, Dayton, Springfield, Columbus, and several other important centers are connected by lines which will enable the tourist to plan his trips in that territory much better than has been possible before. All of these and numerous other cities in the Middle West have been mapped out with the same thoroughness that has characterized the work of the "Blue Book" in the East, and while the map work in the Middle West has only been begun, there are a few general maps that show the "lay of the land."

The New York State and Canadian volume, like the New England volume, sells for \$2.50 postpaid, by the Class Journal Company, Flatiron Building, New York.



MAP REPRODUCED FROM NEW YORK STATE BLUE BOOK, AND SLIGHTLY REDUCED IN SIZE.

SOME FEATURES OF AUTOMOBILE CONSTRUCTION*

By THOS. J. FAY, E.E.

THERE is still another grade of chrome nickel steel that is quite serviceable in motor car work for minor parts, an investigation of which exhibited qualities as follows:

Chrome Nickel Steel—"D."

CHEMICAL COMPOSITION						
Chromium	Nickel	Carbon	Silicon	Sulphur	Phosphorus	Manganese
0.63	2.19	0.39	0.19	0.034	0.021	0.19
to	to	to	to	to	to	to
0.71	2.09	0.36	0.24	0.039	0.026	0.16

PHYSICAL PROPERTIES—NORMAL

T. S.	E. L.	Ex.-2"	Con.-3"	Structure
110,000	90,000	16	64	} Close
to	to	to	to	
100,000	80,000	14	61	

QUENCHED AND ANNEALED

155,000	150,000	12	51	} Close
to	to	to	to	
145,000	144,000	10	56	

This product, while in no way equal to specimens "A" or "B," is distinctly superior to the product "C"; at the same time it costs no more than about one-half the price of the product "C."

- (a) The price of steel is no sign of quality.
- (b) Elastic limit and elongation in conjunction may be considered as a sign of quality if sulphur and phosphorus are low.
- (c) A marked difference between tensile strength and elongation point to "doctored" chrome nickel steel.
- (d) Good carbon steel at two cents per pound is better than bad chrome nickel steel at 20 cents per pound.

Having taken up the properties of chrome nickel steel, it may be well to say a few words about nickel steel.

Nickel steel, if free from seams and its most likely imperfections, would seem to be superior to carbon steel, provided the carbon to nickel relation is closely held; but every time the speaker has used nickel steel, a large percentage of it showed seams and cracks, and recently the speaker observed the utter failure of this product ere it could be put into the car for which it was intended; in other words, the forgings showed cracks, and on attempting "heat treatment" the cracks developed.

Nickel steel is notoriously hard to make, and while nickel steel holds good properties, it is the speaker's opinion that it is too uncertain to be advantageous for use in cars of pretensions.

Carbon steel, in spite of its well-known characteristics, will stand further investigation. Gears, for illustration, of low carbon steel below 0.10, even with high phosphorus and case-hardened, are far superior to gears of from 0.20 to 0.30 carbon acid open hearth steel, which, when case-hardened, shows a coarse crystalline structure, and the "armor" chips off like porcelain.

It would seem, then, for "cementing" case-hardening, gears must be below 0.15 carbon; that is, below the carbon that would show temper when quenched. If case-hardening is not desired, then carbon steel gears should be comparatively high in carbon, say 0.40 to 0.50 carbon, when the results would be as follows:

Carbon Steel—"E."

CHEMICAL COMPOSITION				
Carbon	Silicon	Sulphur	Phosphorus	Manganese
0.45	0.20	0.017	0.024	0.40

PHYSICAL PROPERTIES—NORMAL

T. S.	E. L.	Ex.	Con.	Structure
95,000	41,000	22	44	} Silky
to	to	to	to	
90,000	35,000	18	40	

*Paper read before the Society of Automobile Engineers. Continued from page 854, issue of May 23.

Oil and water-quenched to 850° C. and then annealed to 550° C.

160,000	95,000	12	58	} Close
to	to	to	to	
150,000	85,000	9	54	

In this we have a product costing but a small sum in comparison, yet, withal, quite as good or superior to the inferior grades of chrome nickel steel; hence it is really a question as to the advantage of paying a large sum for an inferior product or a small sum for a superior product, merely to change the name.

Of course, superior grades of chrome nickel steel are so far superior as not to be classed in any way with carbon steel, even when the carbon steel is skillfully treated, and the chrome nickel steel is employed in its normal state.

The speaker has for some time held some views about carbon steel that seemed to elude proof, mostly, perhaps, for lack of time to make curves, such as would bring out the true characteristics. It occurred to the speaker that this might be an opportune moment to air some views on this subject, and the chart Fig. 1 was constructed for the purpose. The chart in question shows several things, among which are as follows:

- (a) The theoretical tensile strength for the respective carbon values can only be attained in practice, for carbon, ranging between 0.10 and 0.40 per cent., unless by some especial attempt or in isolated instances.
- (b) The curve B shows the promised elastic limit of carbon

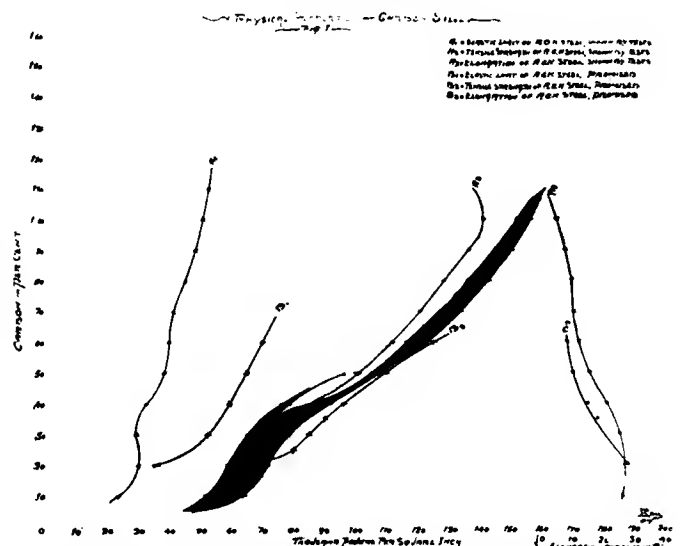


FIG. 1.—Chart illustrating physical properties of carbon steel.

steel,—acid open hearth—which is very much higher than the actual elastic limit, as given in curve A₁ for the carbon values.

(c) The curve B₂ of tensile strength is above the theoretical, whereas the curve A₂ of actual tensile values falls below, for all products above 0.40 per cent. carbon and for mild steel below 0.10 per cent. carbon, while in no case does the actual tensile values even reach the maximum theoretical values.

(d) The curve B₂ shows a lower elongation for the promised steel than that given in the curve A₂ of actual tests, thus showing an actual loss of value on the part of mills in their endeavor to attain a high tensile value and a corresponding elastic limit.

(e) The chart also shows very clearly that acid open hearth steel is superior to basic products, so much superior, in fact, that the minimum expectation with the acid process is the maximum expectation with the basic process.

(f) The curve A₁ shows that the elastic limit of steel, between 0.20 and 0.35 carbon, fails to increase by any well defined pro-

portional value. This is an extremely important matter, because it has been found by oft repeated attempts that gears, for illustration, ranging in carbon between 0.20 and 0.30 per cent., when case-hardened, are very frequently a flat failure,

of car, and very likely the designer figured on a much higher elastic limit of the carbon steel than the limits usually realized in practice; but before leaving this phase of the subject, it may be well to say, a design to be copied, *must include a copy of the materials as well as duplicating the dimensions*,—a Chinese copy—else the process augurs trouble for all concerned.

The question of machining chrome nickel steel is probably of greater interest than any question of details or design of parts that can be exposed at this time, and for brevity the speaker will quote the facts and let reasons stand as self-evident.

In experimenting upon this phase of the motor car question, three sizes of back-geared lathes were used, as follows: 30-inch swing, 20-inch swing, and 16-inch swing. The 30 and 20-inch swing lathes were heavy and rigid and furnished by Isaac Johnson & Son, Jr., of Philadelphia, Pa. Not believing that the smaller lathes were of any real value, they were not actually purchased, but the work was taken out to shops having them.

The relative value of the lathes was found to be as follows:

Thirty-inch lathes rated as 100.

Twenty-inch lathes proved to be 66.

Sixteen-inch lathes proved to be valueless.

The work was all regular automobile product, as crankshafts, connecting rods, and similar parts, of E. F. 60-0 Krupp chrome nickel steel, with a few exceptions, in which Bischoff special auto steel was used. The cuts taken on the 30-inch lathes are shown in Fig. 2 and Fig. 3, and here it may be well to say, forgings, when annealed, cut just as easy as "normal" product, and for the benefit of any who may now be in trouble with forgings, the speaker will be glad to extend further information about the annealing question. The time taken on the respective

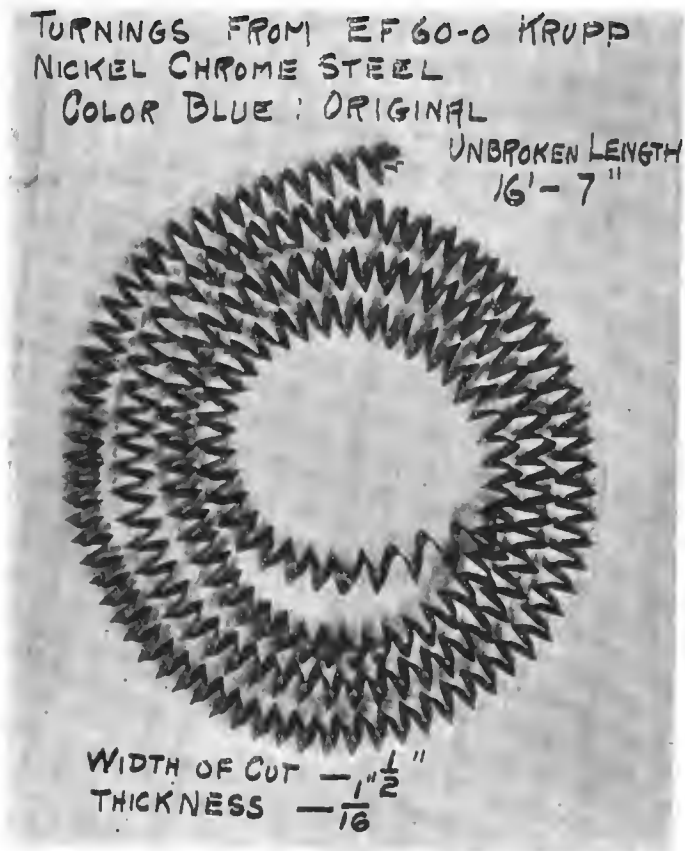


FIG. 1.—Cut from chrome nickel steel taken on 30-inch lathe.

and the only reason for selecting such high carbon is to attain a higher elastic limit than that done to a lower carbon range.

If, however, the gain in elastic limit can not be counted upon, then to risk attaining a crystalline structure is without a good reason, for, as no doubt is well known, steel below 0.20 per cent. carbon may be used without any chance of developing a coarse structure in the bent treatment, referring to good steel, of course. Many failures must be due to the proportioning of parts based on the elastic limit as given in the curve B₁, whereas the curve A₁ is more nearly the true guide. To cite an example for illustration, it is but necessary to put down the figures, viz.:

0.30 CARBON STEEL

A₁ elastic limit, 29,000 lbs. per square inch.

B₁ elastic limit, 52,400 lbs. per square inch.

Any engineer who figures on over 50,000 pounds elastic limit, and realizes less than 30,000 pounds, should stay awake o' nights and worry about the feature.

But a few days ago the speaker inspected a very high-priced foreign touring car, in which the carbon shaft "twisted." The conditions may be set down about as follows:

- Rating of motor..... 40 horsepower.
- Weight of car..... About 3,600 lbs.
- Diameter of shaft..... 1 3-8 inches.
- Material of shaft..... Carbon steel.

It is not the purpose here to "knock," or the question might come up as to why any one should go to Europe to get a car with a 1 3-8-inch carbon steel cardan shaft, to hold down a 40-horsepower motor, or drive a big limousine through a sea of mud.

This was a good case of using carbon steel, exactly the size of a chrome nickel steel cardan shaft in another foreign make



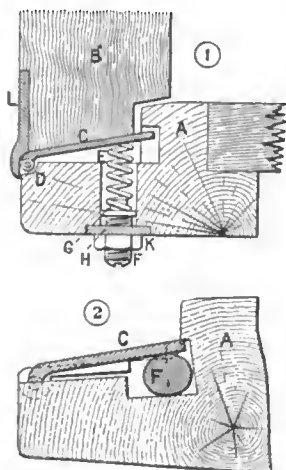
FIG. 2.—Another specimen showing capacity of heavy lathe on alloy steel.

lathes was carefully tabulated for similar parts, and there is no reason to doubt the accuracy of the ratings for the experiment has been going on for several months, and each day proves more conclusively that a large rigid and well-constructed lathe is the best for the purpose. (To be concluded.)

WHAT AUTO INVENTORS ARE DOING ABROAD

It is not necessary to have traveled much by automobile to know that doors have a tendency to rattle when going over an uneven road surface, or whenever the speed is more than a dog trot. Ferdinand Charron, the well-known French automobilist, has devised a simple little appliance to remove this annoyance.

An examination of the sketch, reproduced from the French automobile journal *Omnia*, will readily explain the nature of the invention. *A* is the frame of the door, *C* is the metal plate hinged at *D* and held against the door *B* by a coil spring *E*. The pressure exerted by the plate *C* against the door is sufficient to prevent all vibration. Provision is made for regulating the tension of the spring by means of the screw *F* passing through metal plate *H* and held in position by nut *K*. Fig. 2 is a variation of the first system, the spring being replaced by a rubber ball *F*. Of course the spring or rubber ball must not be too strong to make any difficulty in closing the door.

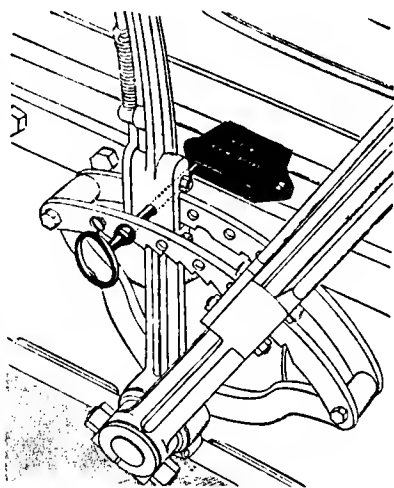


TO CURE RATTLING DOORS.

With the spring this can be regulated to a nicety, but with the rubber no adjustments are possible. A good point of this appliance is the ease with which it can be applied to any automobile body.

A Positive Car Locking Device.

Under the title of the "Autofreund," a German manufacturer has just brought out a novel means of preventing the unauthorized tampering with that most important essential of the car, the change speed lever. It is described and illustrated as shown by the accompanying line sketch in a recent issue of *Der Motorwagen*. There is nothing radically new or novel about the idea, but in view of the fact that even the average street gamin is becoming so familiar with some things about the automobile, that it is no longer safe to leave one standing at the curb unguarded, it would seem that some such precaution as this is necessary. The lever may be placed in the neutral or other notch and the lock can be used, and when thus held fast the key must be inserted through an opening drilled through the side bars of the gateways before it can be released. Lock switches, plugs and similar devices serve a good end by preventing the starting of the car, but it would seem that such an arrangement as this would eventually come in.

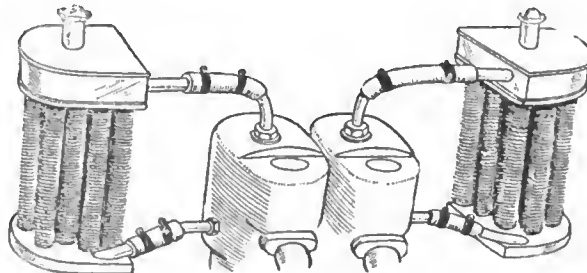


PREVENTS MEDDLING WITH THE GEARS.

A Light Car of Many Features.

The somewhat unusual idea of using an independent water circulating system for each cylinder, though not entirely novel,

is presented here as but one out of the way feature of a new English "light car" called the Phoenix, described in a recent issue of *Motor* (London). It will be recalled that the Swiss racers built by the Dufaux Brothers some two or three years ago incorporated the water-cooling system directly with the cylinder. The idea in this case is somewhat different, as not alone the radiators but all their parts are practically independent, almost the same as if two single-cylinder motors were placed side by side. The circulation is on the thermo-syphon principle and

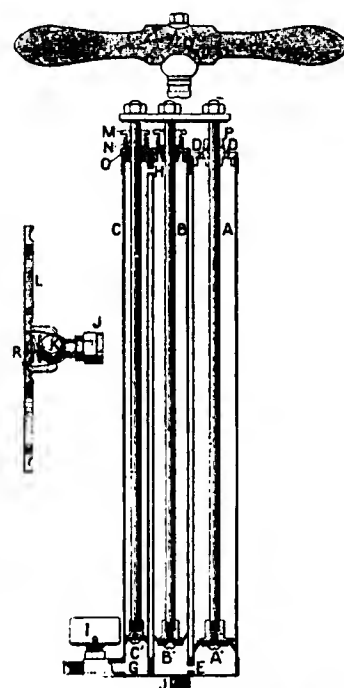


INDEPENDENT RADIATOR SYSTEM OF THE PHOENIX.

the two semi-circular radiators of vertical gilled tubes are placed on each side of the car, with the engine between them, somewhat like the barbettes of a man-of-war. This is not the only unconventional feature—bizarre would be a better characterization, as the vehicle apparently teems with things that are different. It is, in short, a sort of law unto itself. The old time idea of using a two-chain transmission—i.e., a chain drive from the motor to a planetary gear with a second chain from the latter to the rear axle, has been revived among others.

A New Triple Compression Pump.

A triplex pump which has the advantage of diminishing the labor usually attending the inflation of a big automobile tire has been produced by a French inventor. *Omnia* describes it as follows: There are three cylinders, *A*, *B* and *C*, of different diameters, the pistons of which are all operated by the same handle *Q*. The base of the pump is similar to those in general use; it is shown disconnected on the side sketch. When the handle *Q* is drawn up, the three pistons ascend together, air entering by the hole *D* of the guide *P* in cylinder *A*, passes around the piston and lodges below it. On the first down stroke the air is driven through the passage *E* into the connecting cylinder *B*. At the third movement the air compressed in *A* is compressed again by passing from cylinder *B* to *C* by the canal *H*, for the cylinder *C* is smaller than the others. The air having passed under the cylinder *C* is further compressed on the fourth stroke of the pistons. In this pump there is no lost stroke, for the operator compresses air on both the upward and downward movements.



LABOR SAVING TIRE PUMP.

SOME HINTS FOR THE OWNER-AUTOIST

BY THE MAN AT THE WHEEL.

WITH the advent of the summer touring season in full force, there will doubtless be a recurrence of the string of mishaps, many of them fatalities, that are made so much of by the daily press and in the accounts of which the "deranged steering gear" also figures so prominently. Of course, all automobile accidents of the class in question are not traceable to the steering gear by any means, any more than so many fires of unknown origin are caused by "defective insulation" of the electric-light wiring. Many a fire which the ubiquitous scribe has put down to this cause has been found to have taken place in buildings totally innocent of electric-light wiring of any kind; in the same way more than one fatal collision between an automobile and a wayside telegraph pole which has been attributed to a deranged steering gear, has, in some marvellous and unfathomable manner, left that same steering gear in perfect working order after the shock of the accident. Of course, it may be said that the shock righted it, which is not impossible by any means, but "deranged steering gear" may in numerous cases be liberally translated as "reckless speeding," frequently on an unknown road.

The moral is plain, however, for of all the highly important parts of the car, it is probably safe to say that the steering gear comes in for less attention in the way of inspection than any other which has equally vital functions to perform. It is subjected to severe shocks at all times and the wear on its working parts is considerable, but it is seldom dissected for inspection except when necessity actually demands it. No car should be put in commission for another season's running without having this properly attended to. The entire steering gear, connections and linkage should be dismantled, thoroughly cleaned, and any parts that show undue wear replaced. It should then be well oiled, the drag link packed with fresh grease and covered with pliable leather, all adjustments properly made and carefully reassembled. The opportunity should also be taken advantage of to test the front wheels to see if they track properly; this is not exactly a dangerous fault, but it is very hard on the tires and renders steering more difficult and it may lead to injury.

Give the Lubricating System a Good Overhauling.

Of course, there are always a great many things to be gone over in putting a car into commission for another season's use after it has been laid up for some time, and if it is possible to give all of them the proper attention, so much the better, but there are some that should never be overlooked on such an occasion, and it goes without saying that an overhauling of the lubricating system easily heads the list. This is more particularly the case where it is characterized by the use of a number of small bore tubes constituting the separate feeds. It is almost impossible to so place the latter that they will not have some part of their length horizontal, and any tendency of the oil to gum in the tubes or any sediment deposited will be concentrated at such points. Even though the tube be otherwise free, the film of oil that coats its interior surface when the feed stops may have hardened, thus reducing its bore considerably. These leads should be dismantled and, if possible, live steam blown through them. Where not available, plugging one end of the tube and filling it with gasoline which is allowed to stand in it some time will serve as an excellent cleanser. It should be supplemented in either case by shoving a piece of wire through the tubes to make certain that they are clear throughout their length. Similar attention should be paid the interior of the mechanical oiler and the sight feeds, while the crankcase should be drained and flushed with gasoline to clear out all traces of the old oil, the same process being applied to the cylinders, thus insuring a start at the beginning of the season with an absolutely clean lubricating system throughout. Proper attention in good season to such essentials as the steering gear and the lubricating system constitute insurance, the worth of

which is not to be underestimated. Neglect has to be paid for sooner or later, at a rate which causes many an autoist to decry the pastime owing to the heavy expense of keeping his car on the road. It is the old, old story of the stitch in time.

Know Your Own Car and Drive It, Too.

Next to knowing his own car down to the last detail, the owner-autoist who does all his own work should see that he alone does the driving, except when the wheel is turned over to a friend while he is in the car. The subject may appear somewhat outside the province of the present page, but a recent experience which is fresh in mind at the moment makes it opportune to digress a bit to consider whether an automobile is a proper subject to be loaned out at times. Whether he cares to do so or not must, of course, always be a matter for the owner himself to decide; the risk of acquiring some costly experience in this direction is what should prove the deterring factor. Speaking generally, an automobile is not a thing to be borrowed or loaned indiscriminately. No matter how good a driver an autoist may be, no one realizes the needs of a machine to quite the same extent as the man who owns it and takes care of it constantly. Some of these grandstand drivers who can make such an excellent showing before an admiring crowd are notoriously absent-minded when it comes to keeping an eye on the lubricating oil or the water. In the case referred to above as calling the subject to mind, one day's use of a light car by a would-be chauffeur resulted in a bill for repairs amounting to \$50. The engine ran very hot as a usual thing, and if kept on the low gear for any length of time boiled a great deal of water away. The usual thing happened; it is hardly necessary to go into details. Another case that resulted even more seriously grew out of the loan of a car to a friend by a city agent. The friend ran the car all day and part of the night—ran it, in fact, until it would run no longer, because the pistons had seized. In addition to losing the use of the car for a week or more while repairs were being made, the agent had the pleasure of towing it in some twenty miles from where it stranded, and the bill was not light.

An Opportunity to Economize on Lubricant.

While on the subject of the man who not only runs, but grooms his own car, it will be opportune to mention a method of effecting an economy, which, to judge from the majority of cars, is seldom taken advantage of. Of course, it is nothing one way or the other, to the paid driver, whether the lubricating oil put into the crankcase leaks out again half as fast as it is fed, or not. The "old man" pays for it, and, like as not, the driver curses the machine roundly for giving him trouble in this respect, whereas the only thing necessary to prevent this extravagant waste is a little adjustment in nine cases out of ten. It is always easy to detect a road where a number of automobiles have stood for any length of time, or where they pass constantly, even though it be smoothly paved so that no tracks would ordinarily be visible. The trail of lubricating oil that is over everything is as unmistakable a sign of the automobile as horsetracks on a country road are of the equine motor.

This is true of the older cars particularly; the adoption of the continuous engine pan on cars of later design has in most instances only effected one thing and that is to prevent the oil reaching the ground. It falls into the pan, where it is just as much wasted as if it fell by the wayside. Attention to the end bearings of the motor and gearcase and the joints of the crankcase where the oil-pan is bolted to the upper half, would do much to lessen this waste, though much of it is the direct result of an excessive supply. Remedying such a state of affairs is not alone an economy in oil, but it tends to keep things far cleaner, as a motor dripping with oil collects no end of dust and grit.

THE CHAUFFEUR VERSUS THE MOTORMAN

By GEORGE RICE

BOTH of modern creation, and each operating a machine of power and speed, the right of way is often questioned by the chauffeur and the motor car man. It is true that the motor car of the electrical street line is confined within its tracks. These lines of tracks are held as kind of sacred by many of the

motormen. But the inconsiderate chauffeur often fails to realize the importance and restriction of the same. He runs his speedy automobile over the line of tracks at will. He follows up cars to get in the suction of the same, thereby avoiding a head wind, provided that the trolley car goes fast enough to suit him. He crosses at critical points ahead of moving cars, and so on, and to counterbalance all this the motorman of the street car line does even worse things. He feels that he has the right of way between the tracks of his line along his route, and, as his car is pretty heavy and strong nowadays, he is liable to insist upon his rights with force. In fact, I have seen demonstrations of his

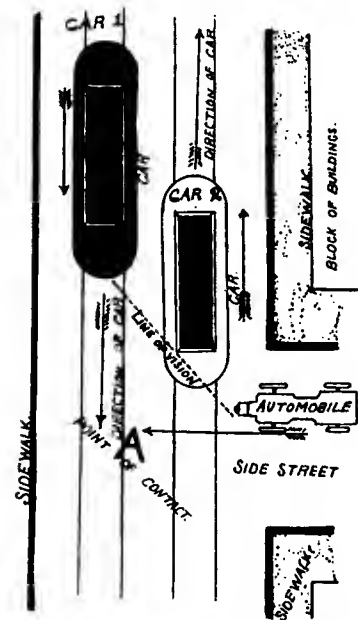


FIG. 1.—Where quick action is necessary.

tactics at various points along the car lines. I thought that a good way to get at the bottom of the thing would be to ride for some time on the front of some of the street cars in the congested sections, and likewise through the country, where automobiles were prone to speed.

Some of the Results of Observation.

I went further than this, and occupied a seat with a chauffeur or two, to get the other side of the question. I had not been on a car long before I observed the motorman apply the brake furiously, while he shut off the power with the other hand. While he pounded the bell, the car shot ahead, and we just barely missed smashing into an automobile which came out of a side street like a wisp-o'-the-hill. Had I been in the motorman's place I could not have done better. He worked quickly and prevented a disaster. The condition was as in diagram Fig. 1. I occupied the front platform of car 1. The car moved in the direction of the arrow. Car 2 moved the other way, and happened along just right to block the line of vision for the motorman of car 1, on the side street. Hence the automobile came out, and the juncture of the car and the machine almost happened at (A). The miss was a narrow one.

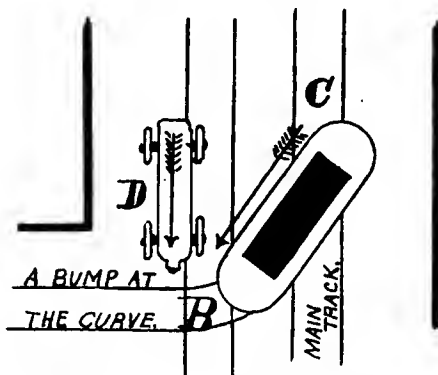


FIG. 2.—A quick turn and a collision.

Then I rode with an automobilist, and the circumstances illustrated in Fig. 2 came up. You can never tell just what a car is going to do. The modern electrical street car moves with considerable alertness in these days of improved mechanical devices. Even the big cars can make a pretty abrupt and quick turn on a curve. We were moving merrily along at good speed in our automobile, following along the line of the track. A car was speeding along in the same direction. Suddenly it turned from the main line (C) down to the cross street, making the curve sharply at (B). We hit this point at very nearly the same time. Our machine was at (D). In another second it was on the dashboard of the car. We got a very substantial bump. Both the car and the automobile came to a stop in the nick of time, otherwise there would have been some serious damage done. As it was, we got out of it with some scratches and abrasions on the machine and car, not overlooking a few on our own persons. After passing the usual compliments of the day with a varied assortment of cuss words, the conductor of the car took the event down in writing and inscribed the names and addresses of the interested witnesses, and then we passed on.

From Rear of Trolley.

Then I rode on the tail end of a trolley car, because I happened to observe a party of automobilists following it up. I had been told that it was dangerous business to follow close in the wake of a car. After the accident (for an accident happened this time) the chauffeur told me that he liked to get in the wind of a car and ride easily along without the breezes fanning his cheeks. I told him afterwards that he

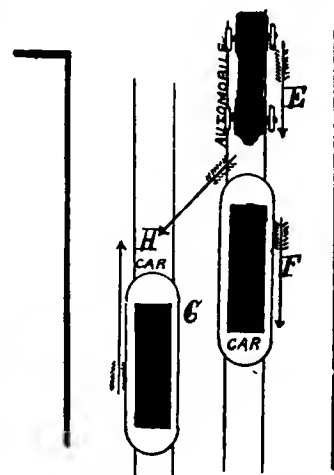


FIG. 3.—Just in time to meet head-on.

ought to put up a wind guard. A wind guard is safer, better and cheaper than utilizing car property for this service. Well, the chauffeur pushed on back of us. He seemed to be very placid. I wondered why the party in the automobile did not reach forward and give the fellow a punch. But he did not. Our car, marked (F) in Fig. 3, suddenly slackened. The chauffeur was on us in his automobile (E). He saw he could not check his machine quick enough to avoid a bump, and therefore he turned off to the other track at (H). Unfortunately, a car (G) was due at that point at that time, and the car was on time. The two came together with a bang. Fortunately no one was hurt badly. But the front of the car (G) and all of the forward end of the automobile was rendered quite unfit for future use. The conventional diarying of episodes was made. Names (most of them fictitious) were taken down for future reference in the courts in the event of claims for damages, and the wrecked machines were towed home very much the worse for wear.

The Menace of the Trailing Wire.

I thought that I was done, but there was more to come. A baby cyclone had struck town, and some of the poles of the power company were broken off as shown in Fig. 4. A lineman was up on one of these poles, with a long wire trailing to the street. The upper portion of the pole had been snapped off by the wind, the pole top being supported by the many wires. The trailing wire wound up on the hub of a driving wheel and pulled the tottering pole top down more and more, with the lineman

making timely remarks. It is very unsafe to run over wires hanging from poles. They might be charged and you might get a shock. It is best to avoid them.

The final incident to which I shall refer is exemplified in Fig. 5. We were scudding along in grand order, through a congested section, when a car came out of a cross street rounding a curve

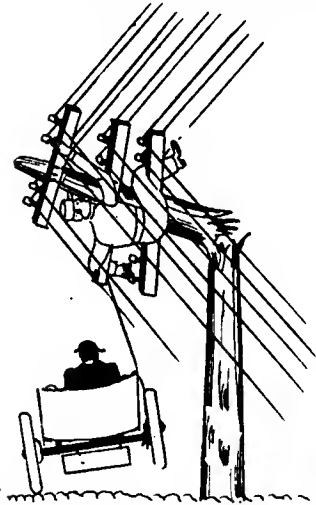


FIG. 4.—Illustrating the trailing wire and broken pole incident.

at our front. There seemed for all the world plenty of space between the fore end of this car and the side of a car which was passing on the other track. But the modern cars are long and the ends often reach far over the curve of the track when making a turn. So it happened in this case. The front of the car swung clear forward and out, and the machine got a good squeeze, as illustrated. I am inclined to believe that both chauffeurs and motormen do all they possibly can to avoid accidents. Nevertheless, in the rush for making time, the machines come into contact occasionally.

But both the modern trolley car and the automobile are heavy bodies, and the amount of energy stored up in them when they are moving even at a moderate rate of travel is only realized when they happen to strike an obstacle. Means of control are proportioned to the size and weight of the cars, but long familiarity with danger makes even the most careful of drivers, whether of automobiles or electric cars, a trifle reckless, and sooner or later they miscalculate. Of the two, it almost goes without saying that the motormen are far more careful as a class than the automobile chauffeurs. Anyone who rides on city street cars for any length of time, and carries his powers of observation with him, cannot fail to notice this at every turn. The instant response to the throttle and the absolute certainty with which the vehicle can be brought to a stop within an amazingly short space, make for a control on the automobile that is equalled by nothing else that travels on wheels. And it is in the mastery of his car in difficult situations that the driver delights. Running beside a trolley car at ten or twelve miles an hour, he spies a truck half a block ahead; a car bound in the opposite direction is coming along at full speed on the other track. Prudence would dictate a slow-down and a momentary

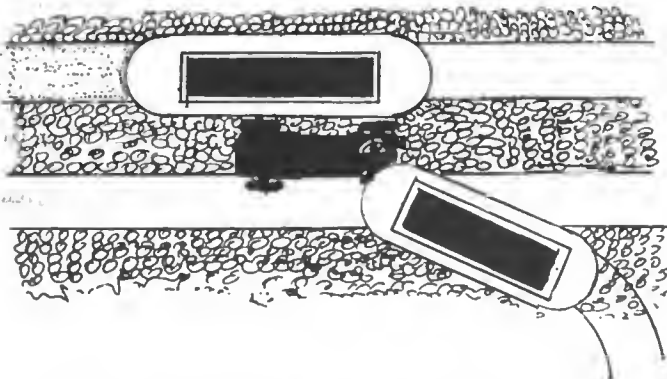


FIG. 5.—Caught between two street cars where one of them turns.

halt for a clear way ahead, but skill at the wheel and levers whispers "You can do it," and though the car is a long one, and there are women and children passengers in the tonneau, he whips the throttle lever down a dozen notches, a quick turn of the wrist on the steering wheel and the trick is done, with the automobile now traveling serenely in front of the trolley car and what appeared to be an impending tangle far to the rear.

THE AUTOMOBILE CALENDAR. AMERICAN.

Shows and Meetings.

- Oct. 31-Nov. 7...—New York City, Madison Square Garden, Eighth Annual Automobile Show, Association of Licensed Automobile Manufacturers.
- Nov. 30-Dec. 7...—Chicago, Coliseum and First Regt. Armory. Eighth Annual National Automobile Show and First Annual Commercial Vehicle Show, National Association of Automobile Manufacturers.
- Races, Hill-Climbs, etc.**
- June 6.....—New York City, 200-mile Endurance Run, under the auspices of the New York Motor Club.
- June 8.....—Cleveland, Third Annual Gates' Mill Hill Climb, Cleveland Automobile Club.
- June 12.....—National Orphans' Day, Instituted by the American Automobile Association.
- June 19-22.....—New York City, Sealed Bonnet Contest, under the auspices of the Automobile Club of America.
- June 20.....—Albany, N. Y., Annual Tour of the Albany Automobile Club; Route, via New York and Asbury Park, to Atlantic City.
- June 27-28.....—Chicago, Elgin-Aurora Reliability Run, Chicago Motor Club and Chicago Automobile Trade Assn.
- July 10.....—Cleveland, O., Start of Fourth Annual Tour of the American Automobile Association, for the Glidden Trophy. Finishes in New York City on or about July 23.
- July 13.....—Chicago, Race Meet for the Entertainment of the Glidden Tourists, Chicago Automobile Club.
- July 25-28.....—Providence, R. I., Annual Meet of the Federation of American Motorcyclists.
- Aug. 1.....—Algonquin, Ill., Hill Climb, Chicago Motor Club and Chicago Automobile Trade Association.
- Sept. 5.....—Chicago, Cedar Lake Economy Run, Chicago Motor Club and Chicago Automobile Trade Assn.
- Sept. 14.....—Albany, N. Y., 95-mile Road Race, under the auspices of the Albany Automobile Club.
- Oct. 19.....—St. Louis, Mo., International Aerial Race of the Gordon Bennett Prize. Aero Club of America.

Motor Boat Races.

- June 8.....—670-Mile Ocean Motor Boat Race, New York to Bermuda. Motor Boat Club of America and Royal Bermuda Yacht Club.
- June 15-28.....—Kiel (Germany) Motor Boat Races.
- July 20.....—New York to Marblehead, Mass., 270-mile Motor Boat Race. New Rochelle Yacht Club.
- August 22.....—New York to Jamestown (Va.), Annual Cruise American Power Boat Association.
- Sept. 2-6.....—Jamestown (Va.) Exposition, Motor Boat Races.

FOREIGN.

Shows.

- June 25-30.....—St. Petersburg, Russia, Automobile Show.
- Nov. 12-Dec. 1...—Paris, Exposition Decennale de l'Automobile. Grand Palais, Esplanade des Invalides, Automobile Club of France.

Races, Hill-Climbs, etc.

- June 3-12.....—Paris, Electric Vehicle Competition, Automobile Club of France.
- June 3-12.....—Herkomer Cup, Automobile Club of Bavaria.
- June 10.....—Pekin-Paris Automobile Tour, Start from Pekin, Inaugurated by "Le Matin."
- June 14.....—German Emperor's Cup, Taunus Circuit, Imperial Automobile Club.
- June 20-22.....—American Gold Cup, Start from New York of European Tour for American Cars, Georges Dupuy, secretary, 1402 Broadway, New York City.
- June 14-29.....—Scottish Reliability Trial, Scottish Auto Club.
- July 2.....—Grand Prix, Automobile Club of France.
- July 14, 1908.....—Paris to London, Aerial Race.
- July 15-18.....—Ostend Week, Record Trials, Automobile Club of Belgium.
- July 21.....—Ardennes Circuit (Belgium).
- July 31.....—Liederkerke Cup for Touring Cars, Ardennes Circuit, Belgium.
- July 31-Aug 8...—Belgium Regularity Contest for Touring Cars, A. C. of Belgium.
- Aug. 1-7.....—Criterium of France, 1,750 Miles Touring Competition and 250-mile Race for the Press Cup, A. C. of France.
- Aug. 11-29.....—France, Coupe de Auvergne.
- Sept. 1.....—Italy, Brescia Circuit, Florio Cup, A. C. of Italy.

LETTERS INTERESTING AND INSTRUCTIVE

That Old, Old Best Car Question Crops Up Again.

Editor THE AUTOMOBILE:

[764.]—I see in the issue of "The Automobile" of May 16, that a Thomas car holds the record for climbing Mt. Hamilton. Now, as my father owns a car of this make (Thomas), I am very anxious to learn what car held the hill-climbing record before the Thomas, and what car it offered to help tow on the way up.

I would also like to ask which make of the following is, in your opinion, the swiftest, the best hill-climber and the best car to maintain: Thomas, Packard, Pierce, Locomobile, Peerless, Matheson, Lozier and American Mors. Also the one that you favor most. Will you please tell me which type of brakes you favor most, the internal expanding or external contracting.

A quick reply will be appreciated. WALTER SELIGMAN.
Cornwall-on-Hudson, N. Y.

Our communication from which the article you refer to was taken was silent both as to the name of the car which previously held the record for the Mt. Hamilton climb, or the car that was found stranded half way up and a tow offered, so that we cannot assist you in clearing up those points.

Your question regarding the best car made is one that has been asked ever since there has been such a thing as an automobile. If a hundred autoists were asked this question, it is very probable that there would be pretty nearly ninety-nine different answers, and each would be quite as conclusive and convincing in the estimation of its giver as it could possibly be made, if care had been taken to choose a hundred people who owned as many different makes of cars. Take it the other way round, and select a number owning the same make of car, and in all probability there would be a considerable diversity of opinion as to its standing, particularly with regard to detailed features of design and construction, as there are many, many owner-autoists who could have built their cars so very much better than the man who was responsible for it—in their own estimation, of course.

Automobiles have now reached a stage where the saying about pretty girls applies to them with equal force: all girls are pretty and all girls are nice, but some more so than others. The same is true of automobiles, with the further distinction that there is "the best car for the price," the "best all round car" and several other kinds of best cars. But the distinction you refer to on the score of hill-climbing is entirely a matter of changing the gear ratio to suit the conditions involved. A car geared for very high speed will be slow on the hills and vice versa, regardless of its make. Your list includes a number of the most representative makes turned out in this country, and the choice of any one is purely a matter of personal preference. Regarding your inquiry on the subject of brakes, the majority of modern cars are fitted with both types of brakes, usually placed on the same drums, fixed to the driving wheels. The internal expanding brake is generally pedal operated and is known as the running brake; the external contracting brake constitutes the emergency brake and is operated by the hand lever.

Methods of Radiator Construction.

Editor THE AUTOMOBILE:

[765.]—To settle a difference of opinion, can you tell me whether there are any standard and well-known water-cooled automobiles on the market to-day, in which the radiators are manufactured by electroplating the copper onto molds or forms?

Santa Fé, N. M.

MANUEL GUITIERREZ.

So far as we are able to ascertain, there are none. The Dufaux cars, made in Switzerland, were turned out a year or so ago with electrolytically-formed radiators, but we understand this construction is now given up. The De Dietrich cars, however, still have radiators built up of soldered-together members which are separately formed electrically. The difficulty that seems to prevent the general manufacture of complete radiators in this way seems to be with the thickness of the metal deposited, which it is almost impossible to get uniform.

High and Low-Tension Ignition Sparks Compared.

Editor THE AUTOMOBILE:

[766.]—In a recent issue you expressed the opinion that the difference in sizes between a jump-spark and a make-and-break cannot be responsible for much difference in time, and gave some figures as to the time required for flame to propagate from a minute point to a size as large as a make-and-break spark. I feel that you do not grasp the situation properly. You can readily see that a fire kindled in the middle of a house may take half an hour or an hour to burn the house, but that when one house is well started, it may set fire to and burn the next one in ten minutes. I mention this simply to bring out the fact that flame propagation is not necessarily at a fixed rate, and that it takes decidedly longer to ignite with a small spark which is barely hot enough to support combustion at all, than it does with a large spark which sets the charge going without delay. I consider it the difference between lighting a fire with a match and scanty kindling in one case and with a torch and ample kindling in the other; and believe it may take as long for a jump-spark to ignite a sphere of gas as large as a pea, as it does to ignite the remainder of the charge after the flame has gained this size.

I believe, and authorities on explosives make similar statements, that there is also a difference between mere ignition and detonation. If a charge of dynamite or gunpowder gives more velocity when fired with a percussion cap than when fired by a fuse or match, why should not an explosive charge of air and gasoline do likewise? Certain it is that considerable difference in power results when a large spark is used. This may be supposedly explained in connection with the jump-spark by saying there is less lag to the coil, which acts quickly with a strong current; but this explanation does not hold good with the make-and-break spark, which acts in the same time, regardless of strength of current. A make-and-break, as ordinarily constructed, must be connected long enough to give a full spark at the highest possible speeds of the engine. This means that it is connected too long with speeds lower than this, so there is no question about the coil being fully saturated, whether the current is full strength or not; and since the spark must occur at the same time, we can only assume that the strength of the spark affects the power of the engine, for there seems to be nothing else to account for this decided difference.

You mention that one spark may be hotter than another in some way not understood. I think the hottest spark propagates most swiftly, and that this partly explains, if not wholly, the difference. A comparison of size of the two sparks may interest your readers. It is well known that compression decreases the size of the jump-spark, but that the make-and-break arc follows the points as they separate and preserves the path for itself, so that it is not decreased by the compression. Also, whereas an engine with a weak jump-spark may refuse to fire at high speeds because of higher compression and yet fire readily at low speeds when the compression is less because of some leaks; the make-and-break spark shows the opposite tendency, and fires best at higher compressions. This simply proves that high compressions do not lessen the make and break spark, and shows that to properly compare without compression, the jump-spark should have its points widely separated, say one-fourth inch. With such points draw a sheet of paper between them while the spark is passed and hold it to the light so the minute holes burned by the spark can be seen. The amount of paper burned by each spark is the correct measure of its heat value. The make-and-break cannot be tested without a contact, so fasten a sheet of paper about 1-32 inch above a metal plate and with a sharp point like a pin make contact with the plate through the paper. Then suddenly, the quicker the better, break the contact and a large spark will follow the pin up from the plate, burning a hole in the paper 1-8 inch in diameter and frequently continuing to burn. When the length as well as the cross section is considered, judging from the comparative holes, it will be seen that the heat of the make-and-break spark is simply enormous as compared with the jump-spark.

Reading, Pa

CHARLES E. DURYE.

We take pleasure in publishing your comparison between the jump spark and the make-and-break or low-tension spark, together with your reasoning and deduction that the latter is the more efficient owing to its much greater size and consequent increase in heat. This with regard to the inquiry of Ralph Walker, letter No. 745, in the last issue of THE AUTOMOBILE. While the test you describe would appear to be conclusive as to the matter of the ignition capacity of the two types of sparks—or, in other words, their relative ability to set things afire, we think there is

considerable difference of opinion on this point when it comes to exploding the charge in a gasoline motor. It is conceded that the heat of the spark, whether at the primary or secondary terminals, increases proportionately with an increase in the current, from which it should follow that the greater the current used in the case of a jump spark system, the better the results to be obtained from the motor. But according to those authorities who have investigated the subject (the most recent and exhaustive report being that of W. Watson, D.Sc., F.R.S., whose paper read before the Royal Automobile Club, was published in *THE AUTOMOBILE* on March 21, 1907), this is not the case. It was there shown that apart from the greater magnetic lag in the core of the primary coil and the consequent need for more advanced timing, the use of a weak current short of one insufficient to fire the charge at all, had little or no effect on the indicator diagram given by the motor. Nor did the width of the gap between the spark plug points have any apparent effect on the power, the net result of the extended experiments made being that the power developed was the same whether a greater or less amount of current was used; or, in other words, whether a large or small spark fired the charge. There is a great deal to be learned on the subject, and we should like to hear from others who have made similar experiments or who hold theories of their own in the matter, as it is one of considerable general interest.

A Rather Puzzling Refusal to Start.

Editor *THE AUTOMOBILE*:

[767.]—I am enclosing a question for your valuable department "Letters Interesting and Instructive," and would be pleased to see an answer printed in that column in the near future.

I have a two-cylinder runabout that I have run for three years, with perhaps less than the usual share of trouble. But last fall it became so that I was unable to start the motor without pouring hot water over the carbureter, and that trouble has continued up to the present, in spite of the change in the weather, which is now warm. Even on a good warm day it is impossible to leave the car standing for an hour without having to warm the carbureter again in order to start. Squirting gasoline into the cylinders when only partially cooled off will start it, but in the morning this is not the case, for as soon as what has been injected is used up the motor comes to a stop. But once started, the motor never ran better than it does to-day. Before I could always start with a little extra cranking, even in winter weather. A reply will be greatly appreciated by
JAMES P. MELZER.
Milford, N. H.

Granting that there has been no change in the character of the fuel you have been using during the period in question, it would look as if the trouble you are experiencing was due to some carbureter derangement, such as the dropping of the float on its spindle, thus reducing the fuel level in the float chamber to such a point that it is impossible for the motor to draw any through the spray nozzle of the carbureter until it has been running some time, which would account for your inability to start by cranking. The effect of heating the carbureter would be to raise the level of the liquid and also to vaporize considerable of it which would then be forced through the nozzle, creating a mixture. The fact that you can always start by injecting gasoline through the petcocks shows conclusively that the failure of the motor to start on the crank is due alone to the lack of fuel. Exactly what constitutes the moving cause of the latter is somewhat difficult to say with certainty, though there appears to be little doubt but that the dismounting and thorough inspection of the carbureter should reveal it. Our opinion that it may be due to the cause outlined can naturally only be a theory under the circumstances, but it is probable that something similar will be found to be at the root of the trouble, though as a matter of fact, the action of the motor, as you describe it, coincides very closely with what would occur where kerosene or other heavy fuel is being employed instead of gasoline. If there are any of our subscribers who have experienced trouble similar to the foregoing and are, as the result, of having successfully overcome it, in a position to shed any light on the matter, we should be pleased to give their views space in this department. We would also be pleased to

learn the result of any experiments you make with a view to overcoming it, as the case is an unusual one and, accordingly, of general interest, particularly as difficulty in starting is generally the bugbear of the average autoist.

FOR AUTOISTS ENTERING AND LEAVING PARIS.

Editor *THE AUTOMOBILE*:

[768.]—Francis Miltoun's excellent articles on touring in France give a wrong impression of the highways around the French capital. Automobilists visiting Paris are apt to give a cursory examination of the map, select the widest and most direct road into the city, and curse all Parisian inlets ever after. I have had occasion to journey by bicycle, motorcycle and automobile on the highways around the fortifications too often to propose a benediction on their behalf. Certain stretches tackled in a light car with a dare-devil French driver at the wheel provide more sensations in five minutes than any other known sport in five days. But everybody who is more than a passing stranger to Paris knows that the paved highways need never be traveled over in leaving or arriving at the city. Francis Miltoun says that it is twenty kilometers of shockingly bad roadway to St. Germain, mostly pavé. True, if you take the main road along with the wheezy local train and the market carts. Wise motorists, however, leave the city through the Bois de Boulogne, cross the Seine at Suresnes, climb the Suresnes hill, turn sharp to the right under the railway, pass behind Fort Valérien, and reach St. Germain by a road comprising twenty feet of pavé and as many kilometers of excellent macadam. When advising travelers to stay at Versailles in order to avoid the twenty kilometers of nerve-racking road into the capital, Francis Miltoun must be thinking of the old highway via Viroflay and Sèvres. That too has been abandoned to the steam car and market cart, the modern road from Versailles to Paris being by the Côte de Picardie, Ville d'Avray, St. Cloud, Suresnes, and Bois de Boulogne. It is a hilly road, but, excepting the short Suresnes hill, has an excellent macadam surface, not an inch of pavé, and is moreover perfectly dustless, the entire twenty kilometers having been recently treated with tar. Rambouillet pavé is all Mr. Miltoun designates it; but there is a loop road at Rambouillet, all macadam, which removes the necessity of jolting yourself and your car to pieces through the old hunting town. A Taride detailed map of the environs of Paris will show how to get into the capital from almost any point without suffering pavé tortures. Any well-informed Parisian chauffeur will point out a score of routes which would have saved Mr. Miltoun unpleasant sensations on his journey into Paris. Good work has been done by the Touring Club of France in opening loop roads through or around pavé-stricken towns. Examples of this are to be found between Paris and Fontainebleau, the macadam loop roads being indicated by conspicuous sign posts. The loops vary in length from a couple of hundred yards to several miles.
W. F. B.
New York City.

A CHAUFFEUR AGREES WITH MR. ATKINSON.

Editor *THE AUTOMOBILE*:

[769.]—In this week's "Automobile" an article on "How to Extend the Life of an Automobile," by A. S. Atkinson, fully confirms what I have found out. I am a chauffeur driving for a private party, and by following the same kind of rules suggested by Mr. Atkinson I have found I have more time to myself and no road repairs to speak of; the car is always ready to go out at a moment's notice, and is in first-class shape. The following are a few rules that have helped me, and might be of service to others:

Always inspect the car at the end of a run, tighten nuts, etc. See that the oil is at the proper level and the grease cups are full; also that the gears have the right amount of oil and grease mixture.

See that batteries are connected and if the plug connections are tight, and once a week test batteries to see if they need recharging. Fill the tank and always strain the gasoline, using chamols or gauze; also strain all water that is put into radiator.

See that the tires are hard enough, and if there is a small cut in the shoe, fill same up with cement, for if you don't it will increase until a blowout is the result. A good plan is to put fresh air into the tires once a month and shift the shoes a bit, as they will not be so apt to rub in one place, and if my car has had hard driving for any length of time I shift the shoes, putting the front ones on the driving wheels.

Never leave the car with its gears in mesh. Always have the lever at the neutral point, making it foolproof.

The above rules have been invaluable to me, and may help some one else.
M. W. BATES.

Nutley, N. J.



RAMBLER MODEL 245 IS A SOLID LOOKING CAR.

AMONG the special designs listed by the makers of the Rambler cars at the opening of the season was their Model 24, embodying several distinguishing features, particularly in its transmission mechanism and rear axle unit. So successful has been the reception accorded this car that Thomas B. Jeffery & Co. have recently placed on the market two additions to their already complete line. These are known as Models 147 and 245, respectively, and are distinguished by the same features of construction and equipment as the Model 24, referred to above. The Model 147 has been designed particularly to fill the demand for a modern four-cylinder car with a comfortable seating capacity for five persons, to list at a very low figure. It will be evident from the following description of this car that its makers, with their tremendous facilities for turning out vehicles in quantity and their well organized purchasing and manufacturing departments, have scored very heavily in the production of Model 147. Neither quality of material nor workmanship has been sacrificed to make the lower price possible, the difference between it and the Model 24 being due solely to its smaller size, decrease in power; though it is, on the other hand, sold with a more complete equipment in that the selling price covers a cape top complete, with the usual front and side storm curtains.

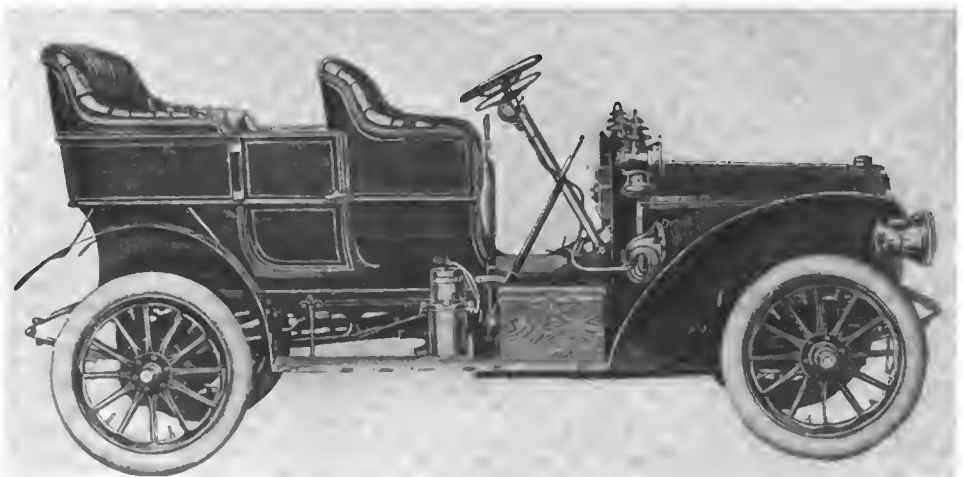
Details of Model 147.—The chassis consists of a pressed-steel frame, strongly cross braced and supported on a suspension distinguished by the use of full elliptic springs in the rear and long semi-elliptics forward. The front axle is of seamless tubular construction reinforced by a solid bar, while the steering knuckles are extra heavy and are supported on ball bearings. The rear axle is the same as that used on the Model 24, the axle housing being of heavy seamless tubing made integral with the differential housing of cast aluminum by a special process controlled by the makers. The differential is of the spur gear type and is distinguished by the use of large pinions made integral with their supporting shafts. End thrust is taken up by means of a large ball bearing placed on either side of the differential case. The axle is of the floating type with the wheel ends of the shafts supported on roller bearings placed outside of the tube.

The motor has separately cast cylinders measuring 4 by 4 1-2 inches bore and stroke, respectively, and develops 20 to 25 horsepower at a moderate normal speed. The valves are located in the cylinder heads and

are placed in removable cages, thus facilitating their removal for inspection and repairs; they are operated by rocker arms actuated from a single camshaft, thus simplifying the design, while their placing is conducive to greater efficiency by facilitating the scavenging of the cylinder and reducing the area of the combustion chamber. This car lists, complete, at \$1,750, and by complete here is meant a full-sized cape top of good quality, side curtains and storm apron in addition to the regular equipments of lamps, horn and tools.

Rambler Model 245.—This is a 35 to 40-horsepower car which is distinguished from the model just described principally by the fact that it is equipped with a larger motor, and the car itself is made proportionately larger throughout to correspond. The motor measures 5 by 5 1-2 inches bore and stroke, respectively, and is of identically the same type as the one already described. It embodies a number of special features of design and the motor as a whole has been evolved by the Jeffery designers as the result of several years' experience in turning out a large number of cars, the majority of which are purchased by owners who drive their own cars, so that simplicity and accessibility have been held paramount. The matter of economy of maintenance and ease of handling have also been considered at length in order to meet the needs of this particular class of buyers as much as possible.

One of the features of chief interest about this car is to be found in its system of transmitting the power. It is provided with the new Rambler type of change-speed gear located on the forward end of the propeller shaft, thus dispensing with the use of a cardan joint at that point, while its position also brings the weight of the gear-set on the frame instead of the rear axle. It is of the progressive type of operation, but trouble from this source has been eliminated by the use of a balanced gear on the lay shaft. The driven pinion at the forward end of the lay shaft is not keyed direct, thereto, but is seated on the hub of a pair of radially extending arms. This member is keyed to the shaft and the arms project into openings in the web of the driven gear with a play of about 10 degrees. A pair of oppositely disposed springs in each arm serve to hold the latter normally in a balanced position midway between the two bearing faces in the web of the gear, so that in engaging the shaft is allowed to yield slightly, thus permitting the easy meshing of the shifting pinions.



MODEL 147 OF THE RAMBLER FAMILY, ANOTHER NEWCOMER.

NEW LINE OF CONTINENTAL MOTORS.

In order to meet the demand for a high-class motor to be used on high-powered cars, the Continental Engine Company, 503 Fisher Building, Chicago, has just brought out a new type, 45-50-horsepower motor, designed along lines favored by the best engineering practise of the day. It has been carefully tested and thoroughly tried out on the seven-passenger Pullman cars, built by the Pullman Motor Vehicle Company, Chicago, so that the makers are now putting a large lot through their works, an elaborate set of jigs, dies and templates being employed for exact duplication.

The cylinders, which measure 5 by 5 1-2 inches, are cast independently, the 13-4-inch .40 point carbon steel crankshaft being supported on five long bearings, the end ones of which are fitted with oiling rings. The cylinders are offset on the crankcase in order to reduce the thrust on the power stroke, and the same is true of the camshaft, which is offset from the plunger rods. This gives an improved balanced action, the roller type of plunger rod having

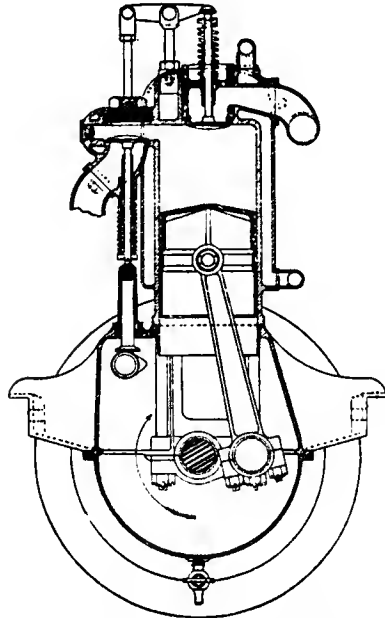


FIG. 1.—End elevation showing offset.

been superseded by a new disk revolving plunger rod which gives a positive action with a minimum amount of wear. The camshaft is a hollow piece of tool steel and is supported on three ample sized bearings of white bronze, the latter also being used in the main bearings of the crankshaft, all being of the die cast type.

The crankpins are hollow and the crankshaft as a whole is balanced after the flywheel has been bolted to the six-inch integral flange, the cranks being carefully aligned centrally with the connecting rods and cylinders. The connecting rods are of die-forged steel and are of I-beam section, with large light bearings at each end, closely fitted at the low or big end, and with provision for side play at the wrist pin. The pistons are care-

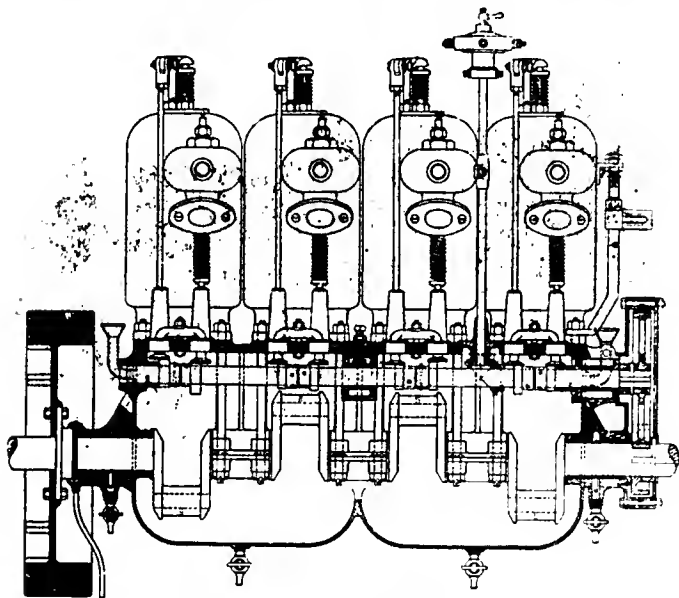


FIG. 2.—Side elevation of Continental motor, camshaft side.

fully ground in taper all over and only tip the scales at five pounds complete, the grooves and rings being carefully ground to a gauge sidewise to prevent any leakage. The piston pin is a hollow piece of hardened steel 1 1-8 inches in diameter, and is retained by a hardened steel snap ring in a groove about the piston so as to clear the cylinder, beside serving as an oil reservoir for the piston pin bearing. It will be noted that the exhaust valve is placed in the head centrally, while the inlet is at the side, though both are operated from a common camshaft. The former is seated in a removable cage, both this and its location adding greatly to the efficiency and convenience of the motor, as it provides a direct exit for the exhaust beside permitting the placing of the inlet and exhaust manifolds on opposite sides with but a single camshaft.

REMINISCENT OF MEDITERRANEAN BOAT RACE.

Discussing the seaworthiness or otherwise of motor boats, Georges Prade relates an amusing incident, not previously made public, of the Alger-Toulon motor boat race, in which it will be remembered all the boats but one finished their cruise at the bottom of the Mediterranean. The big automobile cruiser *Malgré-Tout* was towed out to Alger by a British craft which demanded \$10,000 for this little service. The motor was mounted on carriage springs, which broke during the voyage, placing the motor much lower than the propeller shaft.

The day of the race the engine was cranked with the shaft disconnected, and the boat went out of the harbor under sail, with the roar of the motor in a metal hull as an accompaniment. There was little wind, and the passage out of the harbor was so slow that when she reached the open sea the only craft visible was the torpedo boat destroyer appointed to act as escort. The skipper of the motor boat was an intimate friend of the commander of the torpedo craft.

"Where are the others?" he shouted.

The commander pointed to a few black specks on the horizon.

"All right, pass us the end of a tow rope. Make yourselves comfortable, boys."

The boys did make themselves comfortable; one took a violin, another squeezed and stretched an accordeon, and a third busied himself in the galley with the bouillabaise soup, in which the garlic was not spared.

Mahon was reached at night.

"Stand by to cast off; hawl on the main sheet, up with the jib; crank the engine," were the orders that rang out with a snap and a true accent of the Midi.

With her engine roaring, and her shaft as useless as a log, the craft entered harbor, where the enthusiastic population gave a true Southern welcome to the glorious but modest heroes of the sea, the victors of the trans-Mediterranean race.

TOLD TO ILLUSTRATE ABSENCE OF VIBRATION.

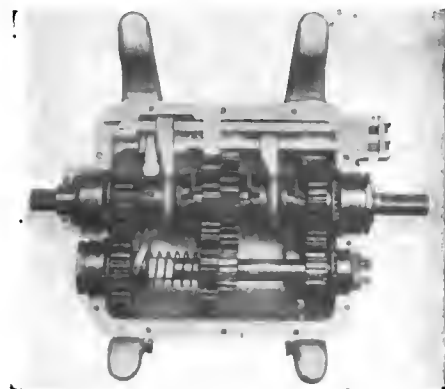
Here is a good and interesting story from the indefatigable press agent:

"Wm. H. Moffitt's 40-horsepower Lozier car left Islip, Long Island (forty miles from New York), one day last week, and before starting, the driver in searching through his pockets for a tool-box key, took out three coins and laid them on the running boards. One hour and forty-five minutes later, what was the driver's surprise on stopping on board the ferry at Long Island City to find these same coins on the running boards where he had left them.

"A story of a similar nature is told by Mr. Michener, demonstrator for the Lozier Motor Company. He, during the winter while taking a photograph of a Lozier car in a winter snow scene on the shore road, twenty-five miles north of the city, left a camera on the running board and did not discover it until pulling into the garage in New York City, it having remained in the same identical spot where it was left, not having moved during the entire trip of twenty-five miles over roads of snow and ice."

NEW JAW CLUTCH SLIDING GEAR-SET.

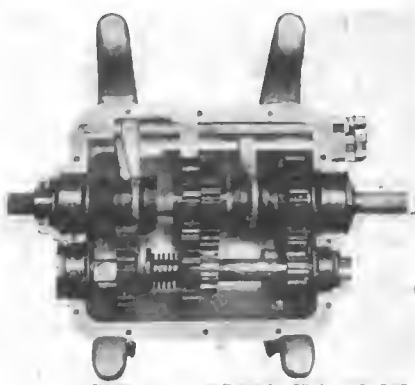
Endless schemes and innumerable modifications of the sliding gear idea have been created. An improved form of gear-set has been invented by Charles Cotta, of Rockford, Ill., who is now placing it on the market. The inherent limitations of size and space naturally restrict the amount of material that may be put



FIRST POSITION.

in the pinions themselves, so that no matter how good that material may be, the teeth of the gears always represent the weakest point of the entire device. To avoid the necessity of bringing the pinions together as much as possible, the selective type of gear-set in which there are two sliding spools, has come to

be the most generally used, and in designing his improvement the maker of the gear-set shown in the accompanying illustrations has taken advantage of this fact and still further improved on it as shown by the accompanying illustrations. This new gear-set provides three forward speeds and a reverse, while on the high-speed the drive is direct with all gears and the lay shaft idle. The pinions of the intermediate, slow and reverse speeds remain permanently engaged with the corresponding gears on the countershaft. They are bushed with bronze, and rotate loosely on the driven shaft. This does away with the necessity of constantly shifting them to effect the different changes of speed, and instead of the relatively small amount of working surface afforded by the gear teeth, sliding jaw clutches are provided as being much better adapted to withstand the shock of engagement, the maker's aim being to place a maximum amount of material where it is most needed in order to withstand the severe service required of a gear-set. The speed ratio is so arranged as to be uniform between the slow and intermediate and between the intermediate and high speeds. The highest grade of steel is employed and both shafts are supported on Timken roller bearings to minimize friction.



SECOND POSITION.

THEORY AND PRACTICE NOT IN ACCORD.

Many interesting calculations have been made as to the striking force of an automobile traveling at various speeds, a favorite being the mile-a-minute clip. According to these nimble figurers, the impact is so terrific as to be practically inconceivable, a car meeting an obstacle at this pace stopping with a force of several million foot pounds. Another has it that such a collision would be equivalent to dropping a car off the roof of a skyscraper. Taking these calculations at their face value, there should not be "a whole bone" left in the car, but this has seldom if ever been fulfilled in practice, as many of the cars that have made these sudden and unexpected stops have survived as far more than the assortment of disintegrated atoms pictured by the calculator.

UNIFORM COMPRESSION IN CYLINDERS.

As the design of multiple-cylinder engines for automobile service becomes better understood, and their use more general, the demand for smoothly running engines has increased, says E. J. Bartlett in *The American Machinist*. This is causing some manufacturers to devote more attention to uniform compression in the different cylinders. Unless the entire combustion space is accurately machined, which is usually impracticable owing to the valve and igniter cavities, there is liable to be enough varia-

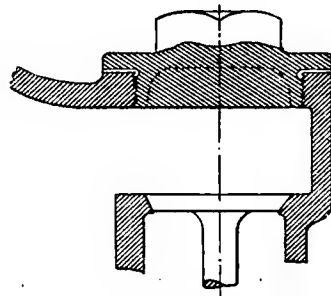


FIG. 1.

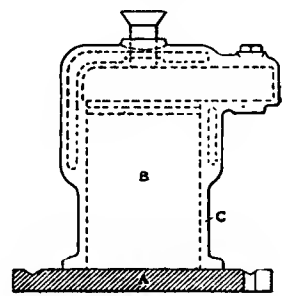


FIG. 2.

Method of machining to obtain uniform compression space.

tion in the cylinder castings so that the power developed in the different cylinders varies to a noticeable extent. During recent tests on some medium-sized four-cylinder engines the fact was brought out that this variation may be several cubic inches in the different cylinders of the same engine.

When one considers that the explosive power is perhaps roughly four times the compression, as registered by a gage, it is not difficult to see that this variation should be guarded against.

A convenient way to overcome the difficulty is to design some of the inserted parts, such as the cylinder-valve plugs, so that more or less of the surplus metal may be machined off as required, as indicated by the dotted line in Fig. 1.

To avoid unnecessary fitting on the engine-assembling floor, several varieties of the plugs, taking up more or less of the compression space, may be machined and used as found necessary. Probably a limit of one-half cubic inch less or more than the normal capacity would be permissible.

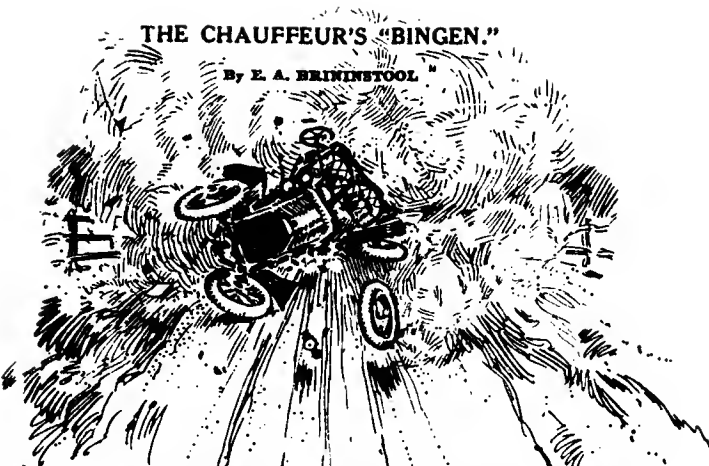
For testing, a simple fixture like Fig 2 will be found advantageous. This may consist of a flat plate A, on which is mounted a dummy piston B of such length that when the cylinder C to be tested is set down over it and on the plate the top of the piston is in the proper relation to the top of the cylinder for the end of the compression stroke. A carefully measured amount of liquid, corresponding to the cubical contents of the compression space desired, may then be poured in through a funnel screwed into the plug hole in the top of the cylinder, and the plug adjusted until the liquid just fills the compression space.

SOME OF THE CAUSES OF RUST.

The rusting of iron is accelerated by the presence of copper, and retarded by such metals as tin, lead, zinc, manganese, aluminum or magnesium; the phenomena are to be attributed to the hydroxide of the metal, which dissolves in the water, for similar stimulating or paralyzing effects are produced on the iron by water which has been in contact with the metal, says *The Electro Chemist*. Arsenic and its compounds exercise a paralyzing effect on the rusting of iron, and when present in large quantities stop it altogether; in this case the dissolved iron hydroxide forms colloidal, ferrous, or ferric arsenite. Soluble salts such as the chlorides and sulphates of the alkali metals have a stimulating effect on the rusting of iron, probably due to their electrolytic dissociation, while among organic substances such compounds as sugar, phenol, or resorcinol stimulate the formation of rust; alcohol or methyl salicylate has a retarding effect, and acetic or salicylic acid dissolves the iron as rapidly as it is oxidized.

THE CHAUFFEUR'S "BINGEN."

By E. A. BRINNSTOOL



A speed-crazed automobilist lay groaning 'midst the wreck,
There were wheels and spokes about him and a tire adorning his neck.
A policeman stood beside him, while reporters, like a flash,
Gathered 'round with ready pencils as he told about the crash.
That nifty chauffeur faltered as he grasped that copper's hand,
Murmuring: "Just how it happend I can never understand;
Bear a message to my company and tell them of my fix,
And don't forget to say I went a mile in twenty-six.

"Tell the house for whom I travel of the daisy run I made,
That I kept the buzzer open and was not a bit afraid;
That I made four laps a-whizzing, and would sure have won the cup
If I hadn't had a puncture and the tire not blown up.
And oh, be sure you tell them of the five or six I killed,
Just before my tire exploded and I skidded and was spilled;
And if they want my record just before I made the mix,
'Tis here on my speedometer—a mile in twenty-six.

"Tell my mother though disfigured I am still within the ring;
That I made the run a-flying like a bird upon the wing.
For my father drove a trotter, and when I was but a child,
I remember how he told me of his races fierce and wild.
And when father died and left me I determined that my plan
Would be to follow after and become a racing man.
I have broken countless records—that was one of father's tricks,
But my Waterloo has met me in this mile at twenty-six!

"There's another—not a sister, but a pretty girl I know—
Who advised me when I started that I'd better go it slow.
And I thought about her caution when I crashed into this fence,
And I reckon she will score me for my lack of common sense.
Just say I couldn't help it, for I'm in the biz for cash,
And I have to take some chances and expect a frequent smash.
She may think that I am suited to be classed with lunatics,
Even though I broke the record by a mile in twenty-six!"

His voice grew faint and hoarser and his grip was limp and weak;
They poured some brandy down him, but he sighed and ceased to speak.
The "cop" bent down to lift him, but he only gave one glance,
Then telephoned the station to send out the ambulance.
And the soft moon rose up slowly and in pity it looked down,
As they dumped him in the wagon and then trotted back to town.
And his ante-mortem statement, just before he crossed the Styx,
Was: "Carve on my headstone simply:



BOOKS ON AUTOMOBILING.

A European Romance of the Automobile—Collectively, it is the usual plot of a villainous foreign count, a pretty girl and a brave Englishman which has been wound round "The Lady of the Blue Motor." If the descriptions of foreign scenes fail to arouse any vivid recollection of Paris and London, and the liberties which the author takes with foreign proper names, sometimes exceed ordinary limits, there is, however, the satisfaction of following the unwinding of a fairly good plot. Why the author should persistently make his characters pronounce "Monsieur" as if they were *faubourgien voyous*, or why he should tamper with the title of the world-renowned Café de la Paix, is not easy to understand. Though G. Sidney Paternoster cannot claim to have produced a masterly sketch of European automobile and racing scenes—and there is abundant raw material available for the word artist capable of handling it—he has the lesser satisfaction of spinning around the Lady in the Blue Car a romance of sufficient interest to hold the attention of the reader to the end of the volume. The book is published by L. C. Page & Co., of Boston.

A Handbook of Gas Engine Design.—The small volume compiled by Sanford A. Moss, M.S., Ph.D., under the title "Elements of Gas Engine Design," gives in a condensed form all the fundamental principles with which the designer of gas engines should be familiar. No attempt is made to go into mathematical or constructional details. In the opening chapters is given a general outline of the physics and chemistry of the gas engine and a discussion of gas engine fuels, followed by a table giving the relative power yielded by various fuels in a given engine. Other chapters give a discussion of the action in a gas engine cylinder from the designer's point of view, methods of finding the size of cylinders for a given power, rational formulas for most parts of a gas engine, with constants derived from modern American practice. Most of the work deals with the four-cycle engine. The work is published by the D. Van Nostrand Company, New York.

Homan's Work Brought Up to Date.—In order to keep abreast of the rapid and constant changes in design and construction that are taking place in the automobile, it is absolutely necessary for any work on the subject to be revised from time to time, as it would otherwise very soon be entirely out of date and merely of interest from a historical point of view. This has been done in the case of *Self-Propelled Vehicles*, by J. E. Homans, and the publishers, Theo. Audel & Co., in announcing the fifth edition, state that it has been thoroughly revised and brought down to date by the addition of a considerable amount of text and illustrations covering the advances made since the appearance of the previous edition, thus making it the most complete work of its kind extant. It is a neatly-bound volume of 600 pages, profusely illustrated with drawings and halftones, and covers the automobile of every type from every conceivable point of view.

New Road Maps for Travelers in Italy.—Valuable work for the convenience of the automobilist and general tourist is being performed by the Italian Touring Club in the publication of a series of fifty-eight road maps of Italy and adjoining islands. The first four of these are already out, and the remainder will appear at intervals, 60,000 of each being printed, making a total of three million and a half copies. Notwithstanding the large number of tourists who annually travel through Italy by automobile, no reliable road map drawn to scale had previously existed. This series is therefore particularly welcome, for it gives all the information required by tourists, such as distances, grades, curves, crossings, monuments, and interesting viewpoints. The maps are printed in seven colors, with all the mountains clearly defined, the work being executed by the Geographical Institute De Agostini & Co., of Rome.



BERLIN'S STREETS NOW SPRINKLED A LA MOTOR.

AUTOMOBILE FOR WATERING GERMAN CAPITAL.

BERLIN, May 1.—A new type of automobile street sprinkler has been added to the street department of the Berlin municipality. The wagon is driven by a gasoline engine carried forward, and has a huge metal tank with two powerful sprinklers in the rear. The throw of water outwardly is calculated to water the full width of the average street at one passage. Being as rapid as the average street vehicle, the automobile water sprinkler does not obstruct traffic, as is done by the horse wagons. As will be seen from the illustration, the capacity of the tank is at least four times that of the old type of vehicle.

MALAY PENINSULA AS A TOURING GROUND.

Automobiling in the Malay Peninsula is far from being an unknown art, writes J. H. Robson, a medical practitioner of Kuala Lumpur, in the State of Selangor. Mr. Robson was the first medical man in the Peninsula to use an automobile as a means of getting backwards and forwards to his home and office. Among the many machines which he has used in the Peninsula are a Stevens-Duryea, a four-cylinder Ford, a Cadillac, a Maxwell, and an Oldsmobile, all of which have given good service.

Perak, Selangor, and Negri Sembilan, the three States on the west coast of the peninsula have excellent roads, flat on the coast and hilly in the interior. A very interesting visit could be made to the peninsula by visitors to the Far East, by landing at Pinang from any of the steamers from Colombo, Madras, Calcutta or Rangoon, and overstaying fourteen days for the next steamer for China. This would give sufficient time for a detailed visit of the peninsula and would allow the tourist to see something of the rubber estates and tin mines. There are fully furnished rest houses, with boy and cook in attendance, at all the places a traveler would care to stay at.

Landing at Pinang, a very interesting trip may be made right through the States as far as the old British territory of Malacca, to the south of Negri Sembilan. The trip could be spread over four days as follows: First day, Pinang to Taiping, capital of Perak; second day, Taiping to Ipoh (Perak), a tin mining center; third day, Ipoh to Kuala Lumpur (Selangor), the Federal capital; fourth day, Kuala Lumpur to Malacca. The distances average about one hundred miles a day. Steamers do not come alongside at Malacca, so that, except in the case of small light cars, it would be well to work back again from Malacca to the chief port of Selangor (Port Swettenham). If arriving at Singapore, it would be necessary to tranship into a local steamer for Port Swettenham, for there are no roads up north through Johor, the mainland opposite the island of Singapore. There are no custom duties on automobiles. Gasoline costs about 80 cents a gallon, 100 cents equalling 2s. 4d. English money. A tourist would probably not be asked to take out a license if he had papers with him. At Kuala Lumpur, the Federal capital, there is an automobile garage. About twenty miles from the town is a very famous sulphur spring and public baths. From K. Kubu, twenty miles north of Kuala Lumpur, there is a railroad to Raub, in Pahang, crossing the main ridge of mountains and ascending for twenty miles at a gradient of one in twenty. The road is narrow, with many sharp curves, but a public automobile passenger service is running over the route. There is a gold mine at Raub.

A uniform automobile law applies to the four States of the Federation, and is largely based on the automobile regulations in use in England. There is, however, no speed limit, the rules stating that no automobile shall be driven at a greater speed than is reasonable or proper, having regard to other traffic on the thoroughfare. As in England, vehicles keep to the left-hand side of the road and pass to the right.



FIGHTING JAP SAILORS FROM THE WARSHIPS OF THE EMPIRE OF RISING SUN SEEING NEW YORK ON THE "RUBBER-NECK" AUTOS.

DARRACQ OFFICIALLY ABANDONS RACING

PARIS, May 21.—There has been a violent thunderstorm in French automobile circles, without any more serious results than usually accompany a summer disturbance. Wagner's departure from the Darracq factory to form one of the Fiat team in all the important European racing events this season was the primary cause of the trouble. Probably all would have passed off with a harmless rumble had not Smith Winby, the president of A. Darracq, Limited, written a letter to M. Darracq, in which he voiced his indignation at the news that the Fiat firm had seduced Wagner, their best driver, on the eve of important races in which their cars were to compete. According to Mr. Winby, the action of the Fiat company was so disloyal, and revealed an intention to conquer by every possible means, good or bad, legitimate or illegitimate, that only one course remained open, namely to withdraw all Darracq racing cars from every event in which they are engaged.

The move was of such an astounding nature, and so contrary to the general principle of the Darracq firm, the creator of racing, first in cycling, later in automobilism, that the public refused to believe it until M. Darracq himself gave confirmation in an interview with press representatives. "Wagner, our first conductor, the winner of the Vanderbilt Cup, in which he defeated all three Fiat machines, has been stolen from us by the Fiat firm, only a month from the German Emperor's Cup race, in which event he will be used against our team," declared the French constructor. "We can easily obtain other drivers, if not for the German event, at any rate for the later races, but I must protest against the spiriting away of our men on the eve of a race. If this is to continue, we shall see our drivers bribed over to a rival firm on the very morning of a race. For this reason we have decided not to race at all this season. Our cars will be offered for sale, and whoever likes to buy them will have the right to run them in the events for which they are already engaged, at their own risks."

A reply was immediately forthcoming from the Fiat firm, signed by Chief Engineer Marchesi, in which he declared that no attempt had been made to seduce Wagner. The Italian declared that Wagner had offered his services, and that there was no special monetary attraction, the salary paid him being that given to all their drivers. Wagner's proposition was accepted on May 1 because a few days previously Dr. Aldo Weillschott had announced his intention of no longer taking part in races.

Neglect of Signed Agreement Caused Darracq-Fiat Dispute.

It should be pointed out that the Darracq company is entirely to blame for any loss it may have incurred. Apart from the contract usually uniting a driver to an automobile firm for one or more seasons, and which would prevent such an occurrence as this, the rules of the Grand Prix stipulate that a written agreement should be drawn up between constructor and driver as soon after the engagement of the car as possible, and lodged with the Sporting Commission. Although it was understood that Wagner should drive for Darracq, no formal agreement had been lodged with the club, and he was consequently free to offer his services to any rival firm or to accept any offers.

Officially the Automobile Club of France and the German Club ignore the decision of the Darracq company. Three machines are entered for the Grand Prix, two for the Sporting Commission Cup, and three for the German Emperor's Cup race, entrance fees totalling 6,650.

Fortunately the Darracq machines will not be absent from this year's races. Hanriot, who entered the Darracq employ last year, has bought his Grand Prix racer, and will drive it in that event on his own behalf. Gustave Caillois, who had been engaged to drive for Darracq this year, and who was to have been entrusted

with a Sporting Commission racer, will very probably buy Wagner's machine and drive it in the Grand Prix, and the third, which should have been in charge of Demogeot, will doubtless go to Lee Guinness, the English brewer, owner of the eight-cylinder Darracq racer. Nothing is yet decided regarding the two Sporting Commission racers and the German Emperor's Cup racers, but it is certain that they will figure in the events for which they are already entered.

Wagner Explains and Protests.

PARIS, May 22.—Additional light on the Darracq-Fiat dispute is obtained by a letter from Wagner. The Vanderbilt Cup champion declares that he signed a contract as racing driver with M. Darracq on July 1, 1905, at a salary of \$60 a month, with a stipulation that the engagement could only be cancelled on either side by payment of \$2,000 indemnity. "April 27," says Wagner, "the Darracq firm proposed that I should sign an engagement to drive in the Grand Prix. I refused, for since my return from Sicily I had decided to leave them, and had already entered into negotiations with Fiat. On May 1 I told M. Darracq that I should leave his service, and immediately handed over the indemnity of \$2,000, as stipulated, this being a larger amount than I had earned in his service in two years. I have not compromised the firm's interests by leaving a month before the German Emperor's race, for at the time of my departure the car was not complete and I know nothing concerning its construction.

"On this occasion my reputation as a driver has been attacked by insinuations regarding the regularity of my stop in the Targa Florio. I was not able to finish because my machine broke down on the third round, while I was leading, as the result of a broken road wheel bearing. Hanriot had to stop for the same reason. I cannot allow it to be said that I have betrayed the firm, and I protest against calumnies calculated to injure my career as a driver. I shall ask the Sporting Commission of the A. C. F. to make an inquiry into my case and verify if it is not absolutely correct that I abandoned the race as the result of a mechanical defect."

CHRISTIE TAKES EARLY MORNING EXERCISE.

Since his first try-out on the Jericho turnpike, Walter Christie has made a few changes in his Grand Prix racer, and is now practising daily on a quiet stretch of road on Lang Island. By special permission he has the exclusive use of a four-mile highway every morning from 4 to 6 o'clock. The machine shows remarkable speed, and Christie is confident of securing a good position in the French race. Experiments are just about to be made to determine exactly the fuel consumption, the Grand Prix, as is well known, being run on a limited supply of gasoline.

FOURNIER RETURNS TO RACING GAME.

PARIS, May 21.—Unable to resist the fascination of racing, Henry Fournier, the victor of Paris-Bordeaux and Paris-Berlin, announced that he will pilot an Itala car in the German Emperor's Cup race on June 14. Fournier abandoned the racing game some years ago, after winning numerous events, introducing the first De Dion motorcycle into the United States in 1896, and later establishing a mile record in the neighborhood of New York. Of late years he has managed the Paris-Automobile garage in the Rue d'Anjou, one of the most important of Parisian swell garages, and certainly the one most frequented by American visitors. Before taking up the Itala agency Fournier did good business as the exclusive Paris agent for Oldsmobile runabouts.

PLEASURES OF AN AUTOMOBILE CAMP

By A. S. ATKINSON.

T IRED of the regulation vacation of a few weeks at seashore or mountain hotel, we decided last year to follow the gypsy plan and establish ourselves in an automobile camp. My wife demurred at first, as wives sometimes do when convention is to be trampled under foot, but two youthful chips of the old block cast the deciding votes.

"We'll go, and if mother wants to go to the hotel——"

But mother didn't want to be separated at vacation time from her brood. So she fell in with our plans and willingly assisted in the preparations. There were no particular plans. In fact, everything was rather indefinite so far as the route was concerned. We were simply to follow the life of the gypsies, substituting the motor car for the regulation gypsy wagon. We had no particular destination in mind, and we intended to live on the road for a few weeks either in camp or in riding.

"We'll be real gypsies, won't we, dad?" queried the youngest

phernalia showed us jointed poles which could be taken apart and stowed away in a three-foot space our difficulty was solved.

But a camp needs other things besides a shelter from dews of night. There was bedding to be provided, cooking utensils, and similar household equipments. The boys compromised on two hammocks—said they preferred hammocks to cots, and all Indians slept in hammocks slung from trees. I didn't know, and yielded to their wishes, but for myself I wanted a cot. The two hammocks were folded up and stowed away under one of the seats. Two cots and mattresses fitted snugly on top of the car with the tent, and, when neatly tied down, with blankets and linen, they were not very noticeable. Over all we stretched a waterproof blanket to protect the bedding from rain and dust.

The next problem was to find a place for the cooking utensils. My wife said we had to have a frying pan, a cooking pot and kettle, a broiler, tin pans, cups, saucers, plates, knives, forks.



ONE OF THE CHARMING CAMPING SPOTS WITH WHICH NORTHERN NEW JERSEY ABOUNDS.

of the boys. "Real gypsies are those who live in wagons and tents, and go about from place to place, ain't they?"

"We can't trade horses and tell fortunes, and gypsies all do that," replied the elder brother, scornfully.

But we did about everything that gypsies do that summer except trade horses and tell fortunes. Our auto was a good type of the touring machine, with seats for five, and amply supplied with lockers, hampers and ice-chest. It was made for long-distance touring, and when fully equipped we could cut loose from civilization for a considerable period of time without suffering any hardships.

But there were other things that we required besides the ordinary equipments for a regulation tour. The boys wanted to camp by the roadside—no hotel for them. They ruled the day, and we finally purchased for \$50 a tent large enough to accommodate four comfortably, with an additional wing for cooking in rainy weather. This tent, when rolled up, took considerable space on top of the car, but when folded neatly it could be concealed from view very well. The poles for the tent were the part of the freight which caused some discussion. I did not care to advertise our intention by sticking eight-foot poles from behind the body or top of the car. But when the dealer in camping para-

poons, and two dozen other articles. After much arguing the number was cut down one-half. She proved a good buyer, for she understood the economy of space as well as the economy of expenditures. She bought pans which fitted snugly into each other, and a kettle which neatly held all the cups and saucers. The plates just filled the bowl of the frying pan, and the knives, forks and spoons made the coffee pot full to the brim. When through with this sort of packing we had only five articles to stow away in the car. We decided to use the body of the car for these ungainly, but very essential, articles and the extra seat for our coats and wraps.

Then the hamper and ice-chest were filled. A small portable gasoline stove fitted snugly under one of the seats. A few dry groceries, such as tea, coffee, sugar, salt and pepper were kept in one of the scat lockers. We decided to do our marketing for the more bulky food as we moved along.

When we crossed the ferry for the shores of Jersey, we felt like an itinerant peddler ready to go on the road with a load of tinware to exchange for old rags and bottles. I listened to every jar, expecting to hear the tinware rattle and give us away. But I gained reassurance when I noticed that no one displayed any special interest in our outfit. Indeed, we did not look over-

loaded or much different from any of the other automobiles with us on the ferry boat.

We were filled with no vague forebodings after we struck the country road. Once away from the city, we bowled along happily, and spent the forenoon in enjoying the fine air and delightful scenery of the fresh fields and hills. We stopped at one of the small towns and purchased supplies for our first dinner. Then we scurried along to find a secluded place for the first camp.

In the hills of northern New Jersey there are many ideal spots adapted to such temporary camps. We found one late in the afternoon on the edge of a pretty little lake, with a stretch of woods back of it. Here, hidden away from all passers, we stopped, and the boys busied themselves in putting up the tent. I collected a few leaves and boughs for reclining seats, while my wife started the gasoline stove and prepared the supper.

Within an hour after we stopped the tent was up, beds made, hammocks swung, and supper ready. Hungry? We were literally starved, and food never tasted better. We ate so much that my wife looked anxiously at the remains, and remarked:



WHERE THE YOUTHFUL ANGLERS CAUGHT THE FISH.

"At this rate it will cost us nearly as much as if we put up at a first-class hotel."

"But the boys enjoy it, and they will gain a pound a day if they eat like this."

We had some nervous misgivings, my wife and I, during that first night in the tent. But the boys slept like tops, and in the morning they said their hammocks were the best beds they'd ever slept on. No strangers or prowling beasts disturbed our slumbers, but a few buzzing mosquitoes did trouble us. The next night we fortified ourselves against these pests by netting all the openings to the tent.

In the morning the boys plunged into the lake and had a bath that made them fit for any troubles and difficulties that might arise. Breakfast was prepared more leisurely than supper. There was no hurry, and the sun was hours high in the sky before the dishes were washed.

"Where shall we motor to-day?" I asked them.

"Why, I thought we were to play gypsies," replied the boys in a breath. "Gypsies don't move every day. They camp out, and then go on when they're tired of the old place."

"Want to stay here longer?"

"Yes, for I think there's good fishing in this lake."

So we decided to spend another night in the camp. The boys went fishing, and in the afternoon my wife and I motored to town to buy more of the necessities of life. We brought back so many that we were dismayed at their bulky appearance. We were really provisioned for several days. The boys had a fine mess of fish for us, and this added to our stores. They had already cleaned enough for supper, and fresh pickerel never tasted better than those which the boys prepared for us.

We lingered three days and nights at the edge of the lake. The boys were interested in the fishing and in exploring the woods. My wife and I took side trips, and spent the rest of our time idly reading and sleeping in hammocks stretched under the trees. Our camp was so secluded that we were not annoyed by any visitors, and when we finally decided to move on we actually felt a sense of disappointment.

We got an early start and covered a hundred miles before night, passing through picturesque, hilly regions and picking up our midday meal from a farmhouse, where fresh milk, eggs and fruits could be obtained in abundance. When night began to approach we found ourselves in a low, flat country, and there seemed no desirable camping place. Finally, in desperation, we struck camp near the roadside in a deserted field. That night our slumbers were disturbed by the croaking of frogs and the hum of hosts of insects. When morning dawned no one made a request to stay longer than necessary. We passed on gladly and made good progress toward more promising scenery.

We crossed Jersey and entered Pennsylvania. The country grew hilly and rougher, and the roads made our progress slower. At times we got lost and had to retrace our steps. But that did not annoy us. We had no objective point, and it all had its amusing side. We struck a small hill town and purchased more goods, and filled our supply tanks with fuel. We made inquiries about the mountain roads, and finally learned that we could strike an ideal camping place, thirty miles beyond, which would give us a beautiful view of three States—Pennsylvania, New Jersey and New York.

Fortune smiled upon us, and we pitched camp in an ideal nook under great spreading oak trees, with green moss for carpet, and a view from our front door that made the heart jump with pleasure. A trickling spring of water a dozen yards away made us feel at home. I knew that we were to stay there for some time, and so unpacked some of my books and papers. My wife was charmed with the view and insisted upon doing some painting. The boys wanted to play Indians and climb some of the neighboring hills and cliffs. I yielded to their wishes, and our camp became an abiding place for nearly a week. I suggested that we were not making the most of our opportunities for motoring, but I was silenced by my wife's remark:

"What's the use of making ourselves a slave to the automobile. We're here to enjoy ourselves."

Our wanderings that month were but a repetition of these few experiences. When we found a camp that particularly appealed to us we stayed until we had exhausted its pleasures, and if we camped in an uncongenial place we left it early the following morning. There were no restrictions to our going or staying.

It was this idle, unconventional life which made the whole vacation a series of pleasant impressions. Each member of the family dropped easily into the free life of the movable camp, and no grumblings came from any lips. The only protests were made when it was decided to head about and return home.

"What, so soon!" exclaimed the boys, who now looked more like two wild Indian lads than school boys.

Only business could break short such an ideal vacation. I yielded a little to their wishes by returning in a roundabout way, so that the trip was prolonged another week. Then we slowly trundled homeward, brown as berries, and so outrageously strong and healthy that we wondered what we would do to find an outlet for our animal spirits in the city.

As to the cost of the trip, I can only refer to my wife's remarks. She was the custodian of the funds, and kept the only accounts of expenses.

"Why, it has cost us a ridiculously small sum. It would have cost us twice as much if we had gone to a hotel for the summer, and the boys have lived in their old clothes. I haven't needed anything new, and what we've saved will fit me out with two new gowns, and there'll be something left for that pair of new lamps for you. And the boys were never so healthy! Look at them!"

I looked, and agreed with her. That fall I had my new lamps, and my wife had her gowns.

CLUBS PREPARING FOR THE SUMMER SEASON

Grand Rapids Club Has Tripled Its Membership.

GRAND RAPIDS, MICH., May 25.—If the Glidden tour doesn't come by way of Grand Rapids, local autoists will meet it in Chicago. They are now planning a tour to Milwaukee by boat from Grand Haven, thence by the Sheridan road to Chicago, to be at the latter place on the date set for the arrival of the tour. Probably 100 members of the club will make the trip.

The new country clubhouse at Cascade is to be open Decoration Day. The clubhouse has undergone extensive repairs to be put in readiness, and a manager has been engaged for the season.

The local club is keeping up its activity in fostering the State organization which has lately been formed. Among the tours that are planned for the summer are one to Kalamazoo and one to Muskegon, when special efforts are to be made to get those clubs into the organization. The club has made itself popular with the public by its stand on reckless driving. At its last regular meeting it appointed a committee to co-operate with the police department in its efforts to stop reckless driving, and the committee was instructed to draw up and have printed a set of rules for driving in the city streets. Everything possible is to be done also to discourage the driving of cars by children, which has been the cause of a number of accidents this season. Twenty new members were admitted to the club at its last meeting, making the total now 175. At the beginning of the season the list of members contained only 58 names.

More Cars Needed for Orphans' Day Parade.

NEW YORK, May 27.—It has been decided that the route for the Orphans' Day parade, to be held on June 12 next, will be from Seventy-second street, at or near Broadway, down the latter to the Brooklyn bridge, and from the other end of the bridge to the Ocean parkway, passing through Prospect Park en route, and ending up at Coney Island, where all the joys of Dreamland will be thrown open gratis to the children. Police Commissioner Bingham has offered the services of a number of mounted men in relays to convoy the parade, and it is probable that he may attend himself, using the big car that he has employed in testing the motorcycle policemen. It is understood that a well-known merchant has offered to supply luncheon to the party. Though a large number of cars have been offered, Chairman S. A. Miles, of the committee of the New York Motor Club, having the affair in charge, states that at least 100 more cars are needed to accommodate all the children from the institutions that have signified their intention of participating. Offers of cars should be sent to S. A. Miles, chairman, 7 East Forty-second street, New York City.

Long Island A. C. Will Locate Village Boundaries.

BROOKLYN, May 27.—Charles Jerome Edwards, chairman of the touring committee of the Long Island Automobile Club, has addressed letters to the presidents and boards of trustees of the different villages of Long Island, asking them to send an official statement of the boundary lines of their village corporations, as related to the main traveled highways, and if they are properly marked by warning signs. In connection with his letter, Chairman Edwards takes occasion to state that the Long Island club does not countenance excessive speeding of automobiles, or the violation of speed regulations, and has no sympathy for the persistent violator who drives his car at a 30 to 50-mile gait on the highways. On the other hand, it is the club's wish to protect, as far as possible, the careful driver, who may innocently exceed the legal speed, and pass into village boundaries without the knowledge of having done so. Mr. Edwards presumes that all of the villages have erected proper signs marking the boundary limits, but states that it is the wish of the club to erect such signs on its own behalf where they are missing.

Worcester Club Will Increase Membership Limit.

WORCESTER, MASS., May 27.—The Worcester Automobile Club will have its monthly meeting June 4. Plans are being made to have a change in the constitution and by-laws relative to the membership limits. At present the active membership limit is 250, and with the present list and the prospects which are in sight for active members there will have to be a change in the limit or there will be a waiting list of actives.

Members of the club and autoists in and out of the club all through Worcester county and city are to be invited to assist with their presence and cars in a parade June 20 in connection with the Old Home carnival which Worcester Merchants' Association will have June 17, 18, 19 and 20.

Word received at the Worcester clubrooms to-day was to the effect that Worcester will be one of the cities in Massachusetts where examinations and tests will be made under the legislative act which was signed by Governor Guild yesterday providing for a more rigid examination as a prerequisite for a chauffeur's license. This will do away with the present practice of making application for the licenses by mail.

Owners and chauffeurs both express themselves as satisfied to have a more rigid examination for the drivers of cars. Instances of cases where accidents have been caused by ignorance of the cars and their mechanism by their drivers were told by the owners, and the general sentiment was fairly expressed by President A. E. Bliss, of the Malden club, who was a caller at the clubrooms to-day, when he said there should be an issue of licenses similar to the licenses which are issued to engineers of stationary engines. These are on the basis of special licenses which permit the holders to run certain engines, and no others, and from that up through engines of different powers to the first-class license which allows the holder to run any kind of an engine.

President John P. Coghlin, of the Worcester club, is doing his short trips around the city in a new Studebaker electric runabout, and is leaving his big Aerocar for the longer trips.

CLUB DOINGS IN GENERAL.

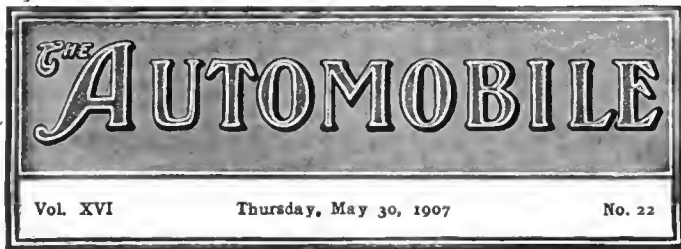
Montclair, N. J.—The Montclair Riding, Driving and Automobile Club was organized recently. L. L. Chinn was elected secretary *pro tem.*, and other officers will be named at a later meeting.

Berkeley, Cal.—An automobile club has been born here. One of its main objects in life will be to obtain good roads and to assist the city superintendent of streets in keeping the thoroughfares in a worthy condition.

Chicago.—Mrs. E. V. Johnson has succeeded Mrs. C. H. Foster as president of the Chicago Women's Motor Club. Other officers are: Mrs. A. F. Chase, vice-president; Mrs. N. J. Boardman, secretary; Miss Anna M. Andrews, treasurer.

Davenport, Ia.—Good roads, reasonable legislation, a State association and some attention to social matters have been decided upon by the Davenport Automobile Club as lines of immediate conduct. It was also resolved to endeavor to obtain the services of Barney Oldfield at a race exhibition in August.

Omaha, Neb.—At the recent annual meeting of the Omaha Automobile Club a number of schemes were discussed for future activities. Good roads were decided upon as the most profitable field, and every effort will be made to improve the streets of the city. Present officers of the club are: Dr. F. N. Conner, president; Gould Dietz and Louis C. Nash, vice-presidents; Lee McShane, secretary, and Emile Brandels, treasurer.



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Is It Possible to Eliminate the Change Speed Gear? This is a question that has been asked ever since the internal combustion motor was first adopted as a prime mover for road vehicles and there appears to be very little doubt that it will continue as a thorn in the side of the automobile engineer for a long while to come. For very obvious reasons it is one of those questions that simply will not down. Much has been done, it is true, but, in a certain sense, what has been accomplished has actually tended to leave matters further from the realization of this ideal than was the case at the outset. The necessities of the situation have been appreciated and a practical change speed gear developed from extremely crude beginnings; during the same period the motor itself has undergone a marvelous amount of improvement, but this has stopped far short of the culmination desired, and its shortcoming still looms up as large as ever.

There are occasional sporadic outbreaks on the part of the publicity man in organizing direct drive "stunts" to show the automobiling world in general that the change speed gear is no longer an absolute necessity on such a paragon of all the automobile virtues as he lauds—it is merely an emergency reserve and a friend in need for the inexperienced driver. But the manufacturer he represents and the majority of others still continue to put a four speed gear-set on their cars where formerly three were considered sufficient. Such performances as those referred to show what can be done by a skillful driver with a clear road, but forcing a motor of the present type until it is ready to gasp its last will not benefit it nor bring the sought-for result any nearer.

Cylinder multiplication has appeared to offer a quasi remedy for the evil, and so far as the use of the six and the eight-cylinder

motor has made it possible to do a much greater proportion of the driving on the high-gear, it may be said to have accomplished the object in view, but considered as a whole the problem remains practically unaltered. It is quite evident that the ability to start under load is an eradicable defect of any internal combustion motor of whatever type, and viewed at the present stage of development, it appears very likely that the need of an intermediate step between the motor and its load, constitutes a short-coming that falls in the same category, in any such exacting and variable service as that called for by the automobile.



The Overgrowth of an Interesting Principle.

"Shall we soon be running about the country on two-wheeled motor cars?" asks an English contemporary with all due seriousness, referring editorially to an invention involving the use of the gyroscopic principle to maintain a two-wheeled vehicle upright, which has been much exploited in the over-seas automobile press recently. "That such vehicles are possible has been proved," it goes on to say. "By means of two gyroscopes placed side by side, and revolving in different directions at enormous speed, the balance is maintained. The gyroscopes work on ball bearings in vacuo, and require little power to operate them."

Since the time when the gyroscope first saw the light in 1832, its possibilities as the basis of a wonder-working discovery have appealed very powerfully to the inventor. In practically the form that it has been known during the interim, it was originally invented as an educational device to demonstrate the principles of rotation, and the only other practical use to which it has been put beside this is in the gyroscopic top—familiar to the majority of schoolboys. Its applicability to the matter of rail transportation is something that falls outside of our province, though even in this field we seriously doubt if it will meet with any greater degree of success than would appear to be in store for it in connection with the automobile. To quote again: "If the new vehicle proves a success, there is no reason why we should not have motor cars with two wheels placed bicycle fashion."

There were those who ridiculed the idea of a man balancing himself on two wheels. That was a mere matter of trying and only the wheels were required; it does not require an engineer to realize that there are several "disturbing factors" in this new proposal. That it is possible, goes without saying, but the history of mono-rail schemes has been discouraging, particularly where they contemplated the balancing of a vehicle at high speeds. We already have plenty of two-wheeled motor vehicles in this country, but we doubt very much if we shall ever see any of the type our English contemporary so optimistically depicts.



Recognition of the Automobile by the Engineer.

For the first few years of its existence the automobile was a source of much comment, supposedly humorous, by the engineering profession, barring those particular engineers who were engaged in its construction, though no one within the charmed pale would ever admit that technical skill entered into the design or construction of an automobile in the early days. Then the profession began to think that probably there was something of merit in the alleged amateurism after all—at least, the success achieved compelled its own change of opinion. The culmination has come within the past year or two, for now the engineer engaged in other lines casts an envious eye on the automobile and hopes for the time when he will be able to specify "jewelry" steel for some of his constructions, such is the respect engendered by the great progress in steel making brought about by the automobile.

Probably the general change of opinion is best reflected in the fact that the American Society of Mechanical Engineers now deems the subject of automobile engineering of sufficient importance to devote an entire session of its semi-annual meeting to the consideration of some details of construction, on which papers prepared by well-known engineers were read.

A. S. M. E. HOLDS AN "AUTOMOBILE SYMPOSIUM."

INDIANAPOLIS, IND., May 29.—At its semi-annual meeting which is being held here this week, the American Society of Mechanical Engineers has devoted an entire session to the reading of papers on automobile construction. The meeting is a four-day affair and began yesterday with formal exercises in the auditorium of the Claypool Hotel, Prof. F. R. Hutton, of Columbia, making the opening address. This afternoon the engineers and their friends went in a body to make a round of inspection of the plants of the National Motor Vehicle Company and the Nordyke & Marmou Company. At this evening's session the following papers on different features of automobile construction were read, some of them, notably that by Mr. Hess, being profusely illustrated with lantern slides. "Air-cooling of Automobile Motors," by John Wilkinson, of the H. H. Franklin Manufacturing Company; "Bearings and Moving Mechanism," by Henry Hess, of the Hess-Bright Manufacturing Company; "Materials for Automobiles," by Edwood Haynes of the Haynes Automobile Company; "Special Automobile Steels," by Thomas J. Fay, and a paper on the "Railway Motor Car" by B. D. Gray. The automobile session filled the big auditorium of the hotel to overflowing and the papers aroused a great deal of interest. A large part of the remaining session is to be devoted to papers on superheated steam practice, including such phases of the subject as its use on American locomotives, its action in an injector, performance of superheaters and the determination of entropy lines.

SEARCHMONT CASE AGAINST A. L. A. M. DISMISSED.

On the ground that the plaintiffs had failed to establish a cause of action, the suit brought by the trustees in bankruptcy of the defunct Searchmont Automobile Company, against the Association of Licensed Automobile Manufacturers, was dismissed by Justice O'Gorman last week, sitting in Special Term, Part VI., of the Supreme Court, in New York City. In its ruling, the court states that, to all intents and purposes, the association is a co-partnership and subject to all the laws governing this relation—a decision that is bailed with considerable satisfaction by the plaintiffs, in that it definitely establishes the status of the defendant. However, as the latter complied with all the rules of the association in declaring the Searchmont Automobile Company no longer a member, the latter's rights were thereby forfeited, and cannot be revived. There is considerable interest in the decision on the part of the members of the American Motor Car Manufacturers' Association, as should the Selden patent not be upheld, and actions for damages be instituted against the licensed association, each of the latter's members, it is claimed, could be held separately liable.

PLANS FOR INDEPENDENT SHOW IN PALACE.

At a special meeting last week between the representatives of the American Motor Car Manufacturers Association and the Automobile Club of America, definite plans were agreed upon for the latter's eighth annual show to be held in the Grand Central Palace at Lexington avenue and Forty-third street. This is the extent of the information, however, as no details whatever have been made public as yet other than the fact that the Aero Club exhibit will also be a feature as at the past three shows.

NO CAR FOR THE NEW JERSEY COMMISSIONER.

TRENTON, N. J., May 24.—Governor Edward C. Stokes of New Jersey has vetoed the automobile appropriation bill, which gave \$4,500 to Commissioner J. B. R. Smith for the purchase of an automobile for his department. The Commissioner had the machine in this city and was operating the same in enforcement of the Frelinghuysen law. The car will now be returned to the manufacturers and a proposition is afoot to purchase motorcycles for the use of the Automobile Department.

TAXIMETERS HAVE NOW REACHED NEW YORK

New Yorkers will make their first acquaintance with the taximeter, the European instrument for measuring distance and recording the legal fare to be paid, on the morning of June 1, on the familiar electric automobiles owned by the New York Transportation Company. With the news that all causes for dispute between cabby and fare are to be removed comes the official announcement that the company will put fifty French gasoline taximeter cabs into service within ninety days. As to the nature of the vehicles the Transportation Company is mum; we are told to wait and see what we shall see.

It is only after a number of experiments that the Cosmos taximeter has been selected as the most suitable for New York condition. It is of German manufacture, and is mechanically very similar to all the instruments of this nature in use in Paris and London. A metal box with a large glass face, with openings on which appear the tariff, fare to be paid and extras, internal clockwork, and a flexible cable communicating with one of the road wheels, constitute the make-up of the apparatus.



"DISENGAGED" AND "ENGAGED" VIEWS OF TAXIMETER.

When a cab is hailed the driver lowers his metal flag surmounting the instrument, and causes either tariff 1 or tariff 2 to appear. The action of lowering the flag registers 50 cents on the payment opening, this being the minimum fare. At the end of the first mile the figures advance to 60 cents, and continue to advance at the rate of 10 cents per one-fifth mile. Should the cab be kept standing after being engaged, the instrument, by means of the internal clockwork, registers 10 cents for every six minutes. Tariff 1 is used when one or two passengers are carried. Tariff 2 is for more than two passengers. Under the higher tariff the rate of pay is 10 cents per one-tenth mile.

Extras are charged when a cab is called from the company's headquarters to any given address, the rate being 20 cents a mile. This is registered by the driver turning a small handle at the rear of the apparatus. In addition to informing the passenger how much he owes the cabman, the taximeter records, by means of a number of totalizers at the rear of the apparatus, the number of individual fares, individual amounts and total amounts earned, and total distance traveled by the vehicle. Thus not only is any dishonest dealing between driver and traveler an impossibility, but the company has a complete control.

Obviously the instrument is hermetically sealed and cannot be tampered with in any way. Excepting that the driver has to wind up the clock once a day, the apparatus is entirely automatic. On the hansom cabs the taximeter is placed near to the driver's right hand, the face being visible to passengers.

Judging from European experience, the initiative of the New York Transportation Company will be rapidly followed by existing rival cab companies, and the numerous automobile cab concerns at present in a nebulous state.



A YOUNGSTER WHO DRIVES HIS FATHER'S CAR.

Warren Willey, of Earlville, Ill., eleven years old, starting on his recent trip from Chicago to Fremont, Neb., in a two-cylinder Reo touring car. Although he can scarcely reach the pedals in sitting on the regular seat, he drove his father's Reo car during all of last season.

THOMAS DETROIT CO. TO ERECT NEW PLANT.

DETROIT, MICH., May 26.—Another great automobile plant is to be built in Detroit. The E. R. Thomas Detroit Company has announced the purchase of twelve acres of ground on the south side of Jefferson avenue, adjoining the new belt line, as a site for a new factory. All the preliminary arrangements have been worked out quietly, and the formal announcement was deferred until the first anniversary of the organization of the company. The E. R. Thomas Detroit Company began business a year ago, and during that time has marketed 500 cars. The new site for the company is four miles from its present location. The buildings will be constructed entirely of reinforced concrete.

The officials of the E. R. Thomas Detroit Company are: E. R. Thomas, of Buffalo, president; H. E. Coffin, first vice-president; R. D. Chapin, treasurer and general manager; J. J. Brady, second vice-president; F. O. Bezner, secretary.

Contracts for the new buildings have been let, and the factory will be occupied September 1. The cost of the plant, fully equipped, will be \$250,000. The old plant will be used temporarily as a storage place for stock.

H. S. HOUP TO HAVE QUAKER BRANCH.

PHILADELPHIA, May 27.—There was a brace of mild sensations in local automobile trade circles last week. The first of them was the announcement of the Harry S. Houpt Company, of New York, that it would about June 1 open a salesroom at 139-141 South Broad street, a stone's throw from the Union League and the Bellevue-Stratford Hotel. Andrew S. Robinson, a former Philadelphian, and later connected with the company's New York establishment, will be in charge. The entire Thomas line will be handled. The selection of the South Broad street location is looked upon as a master stroke.

The second sensation was the closing of a deal whereby the Keystone Motor Car Company, local Packard and Buick agents, will handle the Corbin car here.

THE WELCH COMPANY JOINS A. M. C. M. A.

With the admission of the Welch Motor Car Company, of Pontiac, Mich., to the ranks of the American Motor Car Manufacturers' Association, the membership list of the latter organization now boasts a total of forty-three automobile manufacturers. The latest entrant was long identified with the manufacture of gas engines before taking up the making of automobiles.

NEW COMPANY ORGANIZED AT JACKSON, MICH.

JACKSON, MICH., May 12. Jackson capitalists have organized the C. V. I. Motor Company, and will put a high-grade six-cylinder automobile on the market. The incorporators are W. S. Kessler, president of the Albion Malleable Iron Company; W. M. Thompson, president of the Jackson City bank; P. H. Withington and Winthrop Withington, of the Withington & Cooley Manufacturing Company; H. S. Reynolds, of the Peoples' National Bank, and H. L. Smith, of the Novelty Manufacturing Company and the Metal Stamping Company.

They will equip the car with an engine designed by C. C. Cutting and O. J. Porter. Some new ideas are embodied in the motive power. An experimental engine has been thoroughly tested out, with most satisfactory results. Messrs. Porter and Cutting are stockholders and will have charge of the mechanical end of the business. The company has rented the Hutchison factory at the east end and has placed orders for machinery and materials. It will put out a car which will sell for \$4,000.

THE 1907 PACKARD OUTPUT FINISHED.

DETROIT, MICH., May 27.—The last of a year's output of 1,129 motor cars finished and tested May 23, 1907, twenty-nine days ahead of schedule; "Bill" Birmingham, head tester, the happiest man in Detroit, and every Packard man, from the manager down to office boy, proud as there can be pride of accomplishment—this is the story of the wind-up of the manufacture of 1907 Packard cars.

When this last 1907 Packard "Thirty" had been tested, tuned and adjusted to its smallest detail; had passed the scrutinizing judgment of the head tester, and was ready to be washed and painted, the small army of hypercritics who compose the Packard testing corps roughly painted the rig in national colors, decorated it with all available flags and banners, crowded themselves into it, and paraded the streets of Detroit.

Each season the Packard company has progressed in the working out of a policy of one model a year, a definite number of cars of that model, and a definite schedule of manufacture and delivery. Last winter it worked against weather conditions which seemingly made the testing of cars on the road impossible. Drivers were compelled to face 10-below-zero cold snaps and all other forms of inclement weather that would seem naturally to retard such work. Back of "Bill" and his testers, however, was a system, with Henry B. Joy at the head, S. D. Waldon in charge of the sales organization, and Factory Manager Moore, with his assistants, working out the designs of Engineer Huff.

The Packard factory gradually turns from old work to new. Four experimental 1908 cars are on the road, going through a trial of many thousands of miles.



"BILL" BIRMINGHAM AND HIS CORPS OF PACKARD TESTERS.

THE GROWING GARAGE LIST.

A Modern Garage for Worcester.

WORCESTER, MASS., May 27.—An important addition has been made to the garage list of the city by the opening of the new Pilot garage, between Commercial and Mercantile streets. The building is absolutely fireproof, is built of brick, iron and glass, with granolithic floor, and has separate entrance and exit doors, avoiding the annoyance of turning cars round. The equipment consists of electric light, compressed air plant for inflating tires



WORCESTER'S LATEST UP-TO-DATE AUTO REPOSITORY.

and cleaning cars, electric polishing machine for brasses, electric motors, and a thoroughly equipped and up-to-date repair shop. A special waiting room with toilet has been provided for ladies, complete with writing tables, chairs, etc. There is a private telephone for the convenience of patrons. The Pilot garage is the local agent for Pope-Hartford, Pope-Tribune, and Pope-Toledo automobiles.

Cleveland's Latest and Most Modern Garage.

CLEVELAND, May 27.—Owing to the pressing demand, several departments of the Metropolitan Motor Car Company's new garage on East Nineteenth street, near Euclid avenue, were opened in advance of the completion of the building. The latter is 140 feet square and two stories high, both of which are exceptionally well lighted. An elevator runs from the basement to the second floor. The entire ground floor is an open cemented space, plugs for charging thirty electrics simultaneously being provided, as well as washing racks for five machines. Dry steam is piped from the heating boiler in the basement for removing oil and grease from running gears, thus avoiding the use of gasoline for this purpose, while compressed air is employed for cleaning upholstery. The upper floor houses the machine shop, tool room, woodworking, painting and varnishing departments, automatic fire doors being provided between all the departments. Two 250-gallon tanks underground outside the building, piped to automatic measuring pumps, constitute the fuel supply equipment. The company handles the Pierce Great Arrow, Stearns, Cadillac and Babcock electrics. The officers are W. C. Anderson, president, and J. Theodore Tehen, vice-president, both of whom have been connected with the auto trade in Cleveland for several years past.

Minneapolis Adds a New Garage to Its List.

MINNEAPOLIS, MINN., May 27.—The Evans Motor Car Company has just removed into its new garage at 522-24 Tenth street, S., within easy reach of the finest residential district of the town. The new garage, which is fireproof, built of reinforced concrete and steam heated, has a frontage of 45

feet and a depth of 100 feet. On the first floor are the stock rooms, office and garage. A fully equipped machine shop and storeroom occupy the second floor. Agencies are held for Mitchell, Wayne and Jewel automobiles.

Two New Garages for Asbury Park, N. J.

ASBURY PARK, N. J., May 27.—F. Engelsberg and R. Boone, both of New York, have leased the building on the corner of Lake avenue and Heck street, and will conduct a first-class garage this summer under the name of the Asbury Park Garage Co.

C. R. Zacharias has maintained his garage on the corner of Main street and Sewell avenue. Ker's garage is a new one opened on Main street, while Mark Guy still has the place at 21 Main street.

IN AND ABOUT THE GARAGES.

Cheyenne, Wyo.—A second garage has been opened here at the corner of Nineteenth and Ferguson streets. Fred Voss is the proprietor.

Pasadena, Cal.—John D. Laing intends to erect a large auto garage on East Colorado street, specially equipped for handling high-priced vehicles.

Algona, Ia.—Harry Wilson and Charley Lampright have opened an automobile garage here, and are prepared to do an auto livery business.

St. Paul, Minn.—In a few days the new garage for the Bazille Auto Company on East Ninth street will be completed and open for business.

Ottumwa, Ia.—Don P. McClure, of Oskaloosa, has opened a new garage 66 by 55 feet on Green street, with ample storage room and complete repair shop.

Buffalo, N. Y.—The Starin Company has removed from North Tonawanda, N. Y., to larger and well equipped premises at 1094-1100 Main street, in this city.

Topeka, Kan.—The Topeka Automobile Company is about to commence the construction of a two-story garage, at a cost of \$7,500. The dimensions are 75 by 50 feet.

Crawfordville, Ia.—Robert Irwin will open a garage on North Green street very shortly, where he will have automobiles for hire and additional space for storing machines.

Green Bay, Wis.—The Hoberg Livery & Auto Garage has just been opened for business in Main street. All modern appliances are to hand for storing and repairing automobiles.

Fargo, N. D.—The contract for the erection of the John Haas automobile garage, on the site of the old Columbia Hotel, at Broadway and Second avenue, has been awarded to Bowers Brothers, at \$7,992.

Winona, Minn.—Edgar Spence, of Indianapolis, Ind., has opened a new automobile garage on Center street, between Third and Fourth streets. The new business has been named the Winona Auto & Electric Company.

Seattle, Wash.—The new garage of the Seattle Automobile Company, on Tenth avenue, near Pike street, is nearing completion. The garage has a floor space of 36,000 square feet, and will be fitted with private stalls.

Allegheny, Pa.—The Allegheny Automobile Company has been incorporated and has opened a big garage at 915-919 Irwin avenue under the management of Walter G. Reineman. Glide and Austin touring cars and Rapid commercial vehicles are handled.

NEW YORKERS CAN SECURE OLD NUMBERS.

ALBANY, N. Y., May 27.—At the session of the legislature tonight the Assembly passed the bill of Senator Davis, which Buffalo auto owners wanted so that they might secure old registration seals and numbers. It is one of the few bills affecting motor vehicles passed this session.

BRIEF ITEMS OF NEWS AND TRADE MISCELLANY

A Pope-Hartford Model L has been selected as the official car of the Automobile Club of America.

An electric machine shop for the repair of automobiles has been opened by Mosley-Haigler Electric Company, at 308-310 Lee street, Montgomery, Ala.

A contract has been signed by the White Company for the equipment of their cars with Triumph gages made by the Boston Auto Gage Company of Boston, Mass.

J. D. Maxwell, president of the Maxwell-Briscoe Company, declares in favor of limiting the piston displacement of racing cars as the proper basis for handicapping.

King Alfonso of Spain has added a 22-horsepower Berliet victoria to his automobile stable. The machine will be used by the Queen and the recently arrived heir to the throne when they are able to ride out in the air and sunshine.

The Delphi Machine Company, of Delphi, Ind., has completed arrangements to increase its capacity to five times its present output, and a large building will be erected at once. The company has contracts for a large quantity of automobile parts on hand.

Los Angeles local dealers gave a royal entertainment to the public at its recent track meeting, the feature of which is reported to have been the performance of Harris Hanshue's 32-horsepower Reo Bird, which covered two miles in 1:59 3-5 and five miles in 5:4 1-5.

Foundations are now being laid for a new building adjoining the present Rambler factory, at Kenosha, Wis., to cover an area of 35,000 square feet and ten acres of land. This ground extension makes a total area of forty-five acres covered by the Rambler plant.

F. C. Gilbert, sales manager for the Pope-Toledo automobiles, says it is quite the fad now for purchasers to come to the factory when their car is ready, and drive it home, instead of having it shipped by rail. Distance makes no difference; in fact, the longer the journey home, the more enjoyable the drive.

The Byrider Electric Auto Company has been organized at Cleveland, O., by John and William A. Byrider, of Akron, O., to manufacture electric vehicles. The plant formerly occupied by the Williams Electric Company, at 1948 East Fifty-fifth street, has been purchased, and Fred B. Duncan, of Akron, installed as manager.

The car that was purchased by Motor Vehicle Commissioner J. B. R. Smith, of New Jersey, to run down speed violators was a Type XV Pope-Toledo. Mr. Smith states that "the car is not an extravagance, but an absolute necessity, and will give the department an immense advantage over the automobilists who insist on transgressing the law."

The plant of the Union Automobile Company, in Homewood avenue, East End, Pittsburg, Pa., was damaged to the extent of \$25,000 by a disastrous fire last Saturday. Small boys playing with matches near a lot of gasoline are supposed to have started the blaze. Of eleven automobiles in the garage two were completely destroyed. The garage will be rebuilt at once.

A large plant for the manufacture of denatured alcohol will be built at Cortland, Ohio, fifty miles north of Pittsburg. Twenty-five people will be employed, and the company, in which are included several Pittsburgers, expects to have the product on the market by midsummer. Machinery is being installed and large contracts are being made with farmers for potatoes, fruit and grain. The site is about midway between Pittsburg and Cleveland on the main line of the Erie Railroad.

At the first directors' meeting of the Carter International Automobile Manufacturing Company, Inc., of Detroit, held last week, the following officers were elected: President, Howard Carter; first vice-president, Louis Rosen; second vice-president, J. F. Crotty; secretary, G. F. Dueweke; treasurer, J. E. Winney; general manager, H. F. Koehler. The company manufacture the Carter two-engine car, which was originally produced in Milwaukee. Under the new corporation all interests are centered in Detroit.

Under the title of the Fargo Automobile & Brokerage Company, an organization has been incorporated in Fargo, N. D., with a capital of \$50,000, to do a general agency and garage business. The incorporators are Arthur Gehm, Fargo, president; Fred Lang, Grand Forks, vice-president, and E. H. Probstfeld, Fargo, secretary, treasurer and general manager. The company is already doing business, and handles the Thomas Flyer.

A remarkable automobile performance is reported by A. J. P. Bertschy and George Bertschy, of Reno, Nev. With a 1904 two-cylinder Winton runabout which had been exposed to the weather for twelve months outside a garage, a run was made to the mining camps over very heavy roads. The machine traveled to Boyer's Ranch, passed over Cobalt mountain, a rise of 6,600 feet, and reached Lovelocks in good condition. This is the first auto trip from Fairview to Lovelocks. The buckboard stage which makes this trip uses four horses.

In a letter just received by President Hartford, of the Hartford Suspension Company, from Chas. F. Hart, superintendent of the mechanical department of the Brooklyn *Daily Eagle*, he orders a new set of suspensions for its 1905 Pope-Toledo. In his letter, he states that the old set of suspensions has been on the car for 27,000 miles, of which 9,000 miles were over the roughest streets of Brooklyn delivering newspapers, with never a broken spring. This car has made some record runs in catching newspaper trains.

W. C. Price, 2222 Michigan avenue, Chicago, has just brought out a runabout equipped with a Beaver two-cylinder horizontal motor, with cylinders 4-inch bore and 4 1-2-inch stroke, driving to rear axles by means of a belt transmission from motor to jack shaft, and single chain to sprocket on rear axle. Variable speeds are arranged by tightening or lessening the tension on the belt. Solid tires are used, with 34-inch wheels, and the car complete weighs but 750 pounds. The maker claims great efficiency on all kinds of roads, and expects to form a company to put the cars out in quantity at an early date.

The Gemmer Engine Works, of Wabash, Ind., devoted to the manufacture of motors and steering gears, have been acquired by E. P. Hammond, A. Skae and E. Gemmer, all of Detroit, from the former owners, George Barcus and A. B. Rowley, the purchase price being reported as \$50,000. The business will be transferred to the latter city and will be housed at 741-747 Merrick avenue. Manufacturing will begin immediately, the plant occupying 200 hands in turning out the Gemmer steering gears, of which Mr. Gemmer is the inventor. The company has been incorporated with A. Skae as president; E. Gemmer, vice-president, and E. P. Hammond, secretary-treasurer.

RECENT TRADE REMOVALS.

The Duplex Ignition Company, makers of the Duplex spark plug, has removed from 1555 Broadway, New York City, to larger quarters at 307A West Thirty-sixth street.

The Rainier agency at Pittsburg, Pa., has removed its showroom to new and larger quarters at Seventh and Bedford avenues, and an ample garage will be operated in connection therewith in the future. B. F. Benson, who formerly handled the American Mercedes, has been appointed manager. In locating in the downtown section, the Rainier agency made a new departure in the Pittsburg automobile field, all of the others being located in the East End district of the city.

NEW AGENCIES ESTABLISHED.

The Pope Automobile Company, of Washington, D. C., has been given the agency in that city for the Autocar. The company's line now consists of the several Pope productions, the Locomobile and the Autocar.

A. W. Kirk, who formerly traveled in the South for the Hartford Rubber Works Company, will soon open a store at Atlanta, Ga., for the Hartford tire makers, and carry a complete line of its goods at that point. Mr. Kirk states that the demand throughout the South for the new Hartford Clincher and Dunlop tires with the Midgley Anti-Skid tread is exceptionally large.

The following new agencies have been established by the Corbin Motor Vehicle Company, of New Britain, Conn.: Charles Hanauer Automobile Company, Cincinnati; Flatbush Motor Car Company, Brooklyn, N. Y.; Keystone Motor Car Company, Philadelphia; Arrow Automobile Company, New Haven, Conn.; R. R. Kimball, Omaha, Neb.; Allen, Asten & Co., Greenwich, Conn.

The marketing of the Triple Action spring, the new spring for automobiles invented by D. R. Close, of the Garden City Spring Works, of Chicago, will be done by the Triple Action Spring Company, with headquarters at 1254 Michigan avenue, that city. S. Furmidge is the president of the new company; D. R. Close, vice-president, and Oliver G. Temme, secretary and treasurer. The spring was illustrated and described in *THE AUTOMOBILE* of April 25, page 727.

Cockcroft & Ballou, a newly established firm, have closed a contract with the K-W Ignition Company, of Cleveland, O., to act as American and foreign distributors for K-W ignition outfits. The firm has established headquarters at 122 West Thirty-fourth street, New York City, in a part of the store occupied by the Racine Boat Manufacturing Company as its New York branch, and will carry a complete line of the K-W ignition systems for automobiles and motor boats. The New York store will be in charge of J. D. Cockcroft, who will handle the eastern and foreign end of the business, while F. A. Ballou, with headquarters at 879 Main street, Buffalo, N. Y., will handle the middle western territory.

PERSONAL TRADE MENTION.

Charles B. Shanks, general sales manager of the Winton Motor Carriage Company, of Cleveland, is making his regular semi-annual visit to the Pacific Coast agencies.

H. L. Moody, formerly manager of the American Napier Company, of Boston, has joined the selling forces of the American Locomotive Automobile Company, at 1886 Broadway, New York City.

E. B. Blakely, the former Harvard student, who captured the 100-mile and other prizes at the Ormond Beach meet last winter, is now affiliated with the Electric Vehicle Company, and his future efforts will be devoted to Columbia cars. All the finished Columbias are passed along to Mr. Blakely for a final test before shipment.

Orrel A. Parker, president of the Newmastic Tire Company, Broadway and Sixty-eighth street, New York City, also a charter member of the Aero Club and a member of the committee on streets of the A. C. A., celebrated his marriage with Miss May Robertson Gibson a few days ago. The honeymoon took the shape of an automobile tour from New York to Chicago and back, largely over the route of the Glidden tour.

J. D. Maxwell and Benjamin Briscoe, of the Maxwell-Briscoe Motor Company, Tarrytown, N. Y., left last week for Newcastle, Ind., to inspect the erection of the new Maxwell plant in that city. Before leaving they stated that a circular half-mile track, heavily banked for testing the cars for speed, and an artificial hill with a maximum grade of 30 per cent. for hill-climbing tests, would be a part of the factory's equipment.

Robert L. Winkley, general manager of the department of publicity of the Pope Manufacturing Company, Hartford, Conn., has been visiting the Pope-Toledo factory at Toledo, Ohio. While there Mr. Winkley devoted a considerable portion of his time to riding with Herbert Lytle, the Pope-Toledo driver, over the excellent northern Ohio roads. In speaking of the healthfulness of automobilism, Mr. Winkley states that Lytle is a living exponent of it. He is up at break of day and on his machine, has an appetite that is the envy of his fellows, and looks like the fountain of perpetual youth.

GEO. C. JOHN'S CHANGE OF BASE.

George C. John is to become sales manager of the Pennsylvania Auto Motor Company, Bryn Mawr, Pa., and July 1 will assume his new duties. In the near future Mr. John is to leave the St. Louis Car Company, makers of the American Mors, of which concern he has been sales manager.

NEW TRADE PUBLICATIONS.

An advance 1907 accessories catalogue has been received from the Bishop Auto Supply Company, St. Louis, Mo.

"How Josh Lost and Won" is a story of—well it would be better to leave the reader to find out what it is about. The Columbus Buggy Company, Columbus, Ohio, will supply the booklet free on request.

Messrs. Adam Cook's Sons, 313 West street, New York City, the makers of Albany grease, are sending to the trade a new booklet, giving a considerable amount of information on the lubrication of machinery.

An eight-page folder from the Electric Vehicle Company, Hartford, Conn., supplies specifications and illustrations of the firm's six models of Columbia electric commercial vehicles. The illustrations on the folder are all made from photographs of Columbia vehicles in actual use.

A new booklet has been issued by the Diamond Tire Company, Akron, Ohio, giving descriptions and illustrations of the various types of Diamond tires, and paying particular attention to the Marsh rim. A series of illustrations show the mechanical parts of the rim, method of mounting, dismounting, etc.

Jones speedometers are presented in a dainty little brochure issued from the company's headquarters at Broadway and Seventy-sixth street, New York. The various types of speedometers for automobiles and bicycles are illustrated, and a colored engraving is given of the Jones triplet combination.

"The Why of It" is a folder from the S. F. Bowser & Co., Fort Wayne, Ind., telling the why of the well-known Bowser gasoline tanks. A further booklet deals with the Bowser system of factory oil storage; still another describes in detail the Bowser system for storing and handling gasoline and lubricating oils.

Voluminous, carefully compiled and well printed, the catalogue of the Auto-light and Motor Supply Company, 506-508 North Broad street, Philadelphia, contains all the multitudinous articles which the modern automobile demands. Everything from a cotter pin to powerful headlights has its place within the covers of the 140-page book.

With a closely printed volume of over two hundred and thirty pages, the automobile man should find everything he needs in the way of supplies and accessories. The big volume is issued by the Excelsior Supply Company, of Chicago, and contains descriptions and prices of everything likely to be of use or adornment to the chauffeur or his machine.

The Servitor model C automobile, constructed by the Barnes Manufacturing Company, Sandusky, Ohio, is the subject of a new catalogue just sent forth from the firm's headquarters. The machine is a 20-horsepower air-cooled run-about, full particulars of which are given in the catalogue in addition to illustrations of the interior and exterior of its birthplace.

With the regularity of rent day the Silent Partner appears. Volume two, number two, is as full of thought as its predecessors and will be read with as much interest. Its nature is too well

known to need comment. Those who have not studied its pages can remedy the defect by writing to the Globe Machine & Stamping Company, Hamilton avenue, Cleveland.

The annual catalogue of the Purdue University at Lafayette, Ind., is a 300-page volume forming a thoroughly complete guide to the equipment and courses of study at the university for the 1907-1908 session. It comprises a full list of officers, professors and assistants, an account of the material equipment of the institution, courses of study, and description of courses.

The new catalogue of automobile and motorcycle sundries which has just been issued by the New York Sporting Goods Company, 17 Warren street, New York, is a big book of one hundred pages, brimful of illustrations and descriptions of all sorts of motor fixings and accessories, with a few pages devoted to marine engines and boat supplies. A copy will be sent free to anyone who applies by letter.

There is something of real practical interest to the automobilist in Bulletin No. 20, issued from the Coates Clipper Manufacturing Company, Worcester, Mass. It describes in detail the construction of the Coates steel, ball socket joint, unit-link flexible transmission. In addition, drill presses, breast drills, buffing outfits, portable motor trucks, radial drills, etc., all equipped with the Coates flexible transmission, are described and illustrated in the catalogue.

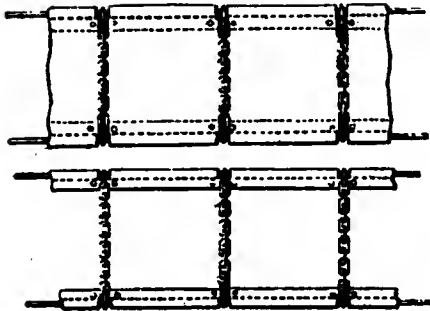
From the Bayard-Clément headquarters has been received the firm's complete catalogue, in French, illustrative and descriptive of the wide range of automobiles produced in the modern factories at Levallois, near Paris, and at Mezieres in the Ardennes. There is a short sketch of the head of the firm, Gustave Adolphe Clément, the "industrial giant who says little but thinks much," and a description with illustrations of the main factory at Levallois, on the banks of the Seine.

Owing to the rapid development of the automobile and the radical changes from earlier models, it is a difficult problem to systematize and present in catalogue form all the multitudinous parts in regular demand. A work of this nature has been produced in an exceptionally simple and yet complete manner by the Pope Motor Car Company; Waverley Department, Indianapolis, manufacturers of the Pope Waverley electrics, in their catalogue of parts just received. The arrangement is excellent; illustrations are used throughout; parts are divided into groups, and are also indexed and numbered, so that any particular part can be readily found.

An exceptionally interesting and attractive book has been produced by the Continental Caoutchouc Company and forwarded to us by the New York agency at 43 Warren street, dealing with Continental tires in the Herkomer and other European contests. As a souvenir of the great German touring competition, the book will be welcomed by all automobilists, for it consists of over one hundred and twenty pages, each one bearing a half-tone engraving of some scene in last year's competition. The artistic cover bears a realistic photogravure of a speeding machine on the Herkomer course, and the frontispiece consists of an engraving representing Professor Hubert von Herkomer, donor of the trophy.

INFORMATION FOR AUTO USERS.

New Tire Tread Chain.—From the southwest, namely, Corsicana, Texas, comes another invention of the type designed to give traction at the driving wheels without grinding the tires to pieces in the operation. Its sponsor is



THOMAS' TIRE TREAD CHAINS.

J. Clarence Thomas, who is a Texas "auto-doctor," and he has made application for a patent on the device. As shown by the accompanying cuts of it, there seems to be every reason why it should successfully fulfill its mission, and no doubt it is the result of Dr. Thomas' ripe experience on the muddy roads of the southwest country. It is made in several forms, to suit the nature of the roads on which it is to be used; one of these not shown is in the form of a combined studded tread and set of chains, the latter fastening to side wires by means of hooks, as shown in the lower lefthand cut reproduced herewith, the side wires themselves also being fastened together with a small hook. The second of the three sketches shows a chain grip and smooth tread, and the lower or last figure a plain chain grip, all of the different types using the same method of side-wire fastening. Mr. Thomas has tested his invention over some of the choice samples of road that Texas has to offer and has found them to work very well.

Toggled Top Oil Cups.—Four types of Bennett toggled top oil cups are manufactured by the Bay State Stamping Company, 380 Chandler street, Worces-



STYLE A.

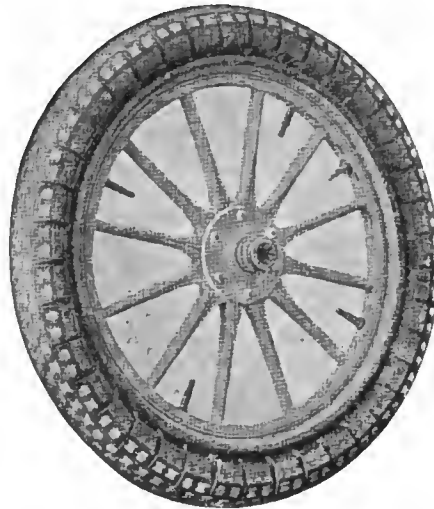


STYLE B.

ter, Mass. The two illustrated, Style A and Style B, are made to screw into the bearing with a threaded cover, with packing to make it perfectly oil tight. The

only difference between the two is in the cap, this screwing down in one case and slipping over the cup in the other. Two other styles are made plain to drive into the bearing. The cups are manufactured in three sizes, 3-8 inch, 1-2 inch, and 5-8 inch diameter of the cup. Prices vary according to size and method of construction.

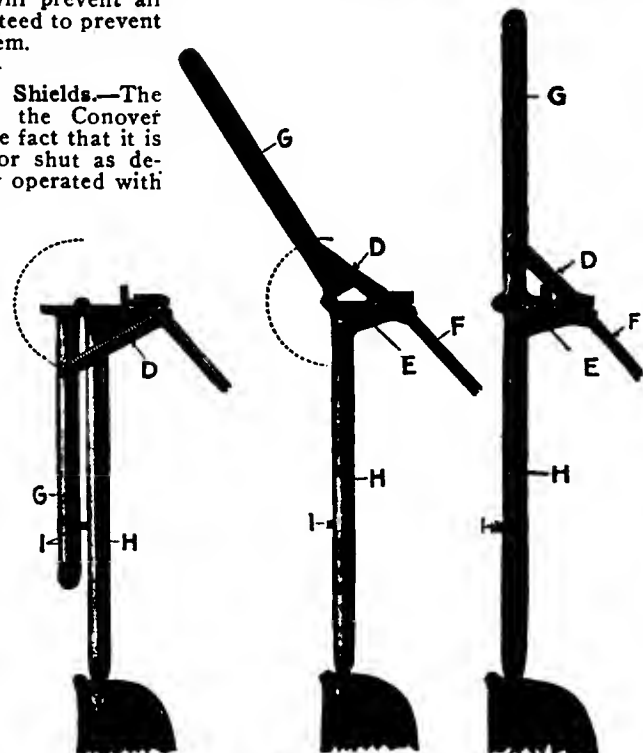
A New Leather Tire Cover.—The Maplebay Manufacturing Company, of Crookston, Minn., has produced an automobile tire cover made of waterproof leather specially tanned for the purpose and guaranteed not to shrink or harden. The edges of the cover as well as the tread of same are protected from wear by steel plates, and the cover is fast-



MAPLEBAY LEATHER TIRE COVER.

ened to the wheel by steel clips which go under the edge of the clincher, making a very neat attachment. It is not claimed that the cover will prevent all punctures, but it is guaranteed to prevent a large proportion of them.

Conover Folding Wind Shields.—The distinguishing feature of the Conover shield is to be found in the fact that it is automatically held open or shut as desired, and can be instantly operated with one hand without the necessity of stopping the car, as is necessary where there are a number of nuts to be loosened and retightened. Just how this is accomplished will be clear from the three side views of the shield showing it in different positions. The first pictures it upright or in the usual running position; the second part way open, and the third, folded down. The spring D serves to control the upper half, whether in place or folded, while the catch E effectively prevents rattling when the shield is up. The rubber bumper I serves the same end when it is folded. The former fastening is made with rounded corners, so as to permit of its opening under



THREE SIDE VIEWS OF CONOVER FOLDING WIND SHIELD.

a sharp pull, so that all that is necessary to shift the position of the shield is to take hold of it. The shield is of 3-16 inch plate glass, while the frame and all the fittings are of polished brass, making it very attractive in appearance. It is made in three sizes, 24, 30 and 36 inches wide by 29 inches high, and readily adaptable to any of the standard forms of dash employed, and requires very little fitting. The Conover Motor Car Company, Paterson, N. J., are the makers.

Green Oil Soap for Automobile Cleaning.—So much expense and labor is lavished on the exterior finish of an automobile body that it is small wonder that the average owner soon becomes disgusted with the result of applying the so-called cleaning compounds to this brilliant surface after a short time. No varnish finish is ever subjected to more severe duty than that of an auto, and in consequence, much greater care is necessary if it is to preserve a semblance of its original brightness after a few months' use. The same care that keeps the varnish of milady's brougham gleaming bright day after day in all kinds of weather is necessary if the auto is to present the same appearance, so that the Monahan Antiseptic Company, 123 Liberty street, New York, who have been making green oil soap for the past fifteen years to keep varnish clean, know the requirements of the case pretty well. Garage keepers have come to recognize the efficacy as well as the economy of this soap for keeping cars clean and it is largely used in this city. It is put up in packages convenient for all users, viz., in 5, 10, 25 and 50-pound pails, and kegs, half-barrels and barrels.

Firestone Dismountable Rim.—The advantages to be derived from the use of a well-designed dismountable rim, are well known to automobilists, theoretically at least. Annoying delays on the road from punctures, and the risk of pinched tubes

from hurried wayside mounting are removed. The Firestone Tire and Rubber Company, of Akron, O., has recently produced a dismountable rim which will appeal alike to racing men and tourists. Safety is assured by a complete bearing surface, and a mechanical fastening which prevents creeping and absolutely locks the rim in position. To remove the rim, all that is necessary is to loosen the six nuts, allowing them to remain on the bolts, turn clips



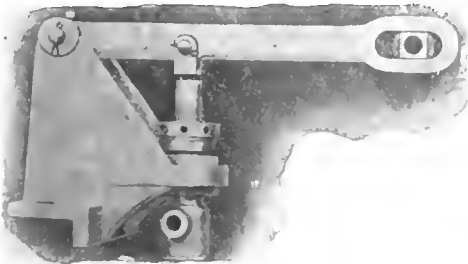
FIRESTONE DISMOUNTABLE RIM.

FIRESTONE DUAL TREAD TIRE.

in the opposite direction, then tighten nuts to hold clips in that position; the rim may then be slipped off with ease. To adjust the extra rim with its inflated tire, this operation is merely reversed. A socket wrench is the only tool required. A feature of the Firestone is that should it be necessary the tire can be inflated without removing rim. In some makes the valve is cut so short that it is impossible to inflate, except when the rim is dismounted. The Firestone dismountable may be used in connection with all standard clincher tires and rims on any automobile wheel, the expense of changing being nominal.

Another new feature from the Firestone factory is a dual tread tire which provides the best non-skid feature in rubber, affords an added wearing depth, gives an additional protection against punctures and a wider surface contact with the road. The dual tread is somewhat thicker than the ordinary tread and consists of two ridges of rubber about 5-8 inches high and from 1 1/2 to 2 inches apart, extending around the tire. It is adaptable to tires of 3 1/2-inch size and upwards, and may be incorporated in any type during manufacture.

Hill Climbing Pump.—The Clark hill climbing pump, produced by Edward S. Clark, of 272-278 Freepoint street, Dor-

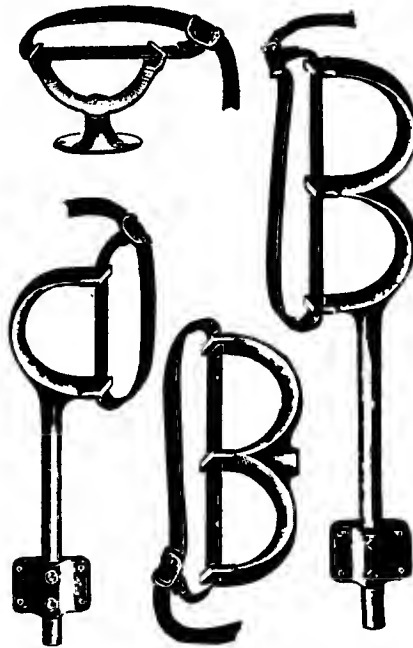


CLARK HILL CLIMBING PUMP.

chester, Mass., is designed to be fitted to White steam cars, model 1903 and 1904. The pump is shown in accompanying il-

lustration. The by-pass valve is fastened to the dasher. Pump bracket is made to bolt on to the frame that supports the engine lugs, only two bolts being required for this. The sliding block on the pump lever is hardened and is made to fit the pin that drives the air pump. It sets close to the engine and does not interfere with the regular pump connection. All the parts are sent with pump ready to apply, with exception of threading pipe, which has to be cut to fit the car.

Victor Adjustable Tire Holders.—The Manhattan Storage Company, of 1611 Broadway, New York, is now marketing a series of adjustable tire holders to fit any car and any size tire. One arm reaches forward and is fastened to dash, the other going to the end side of the front seat projection. They can be carried any distance apart to accommodate

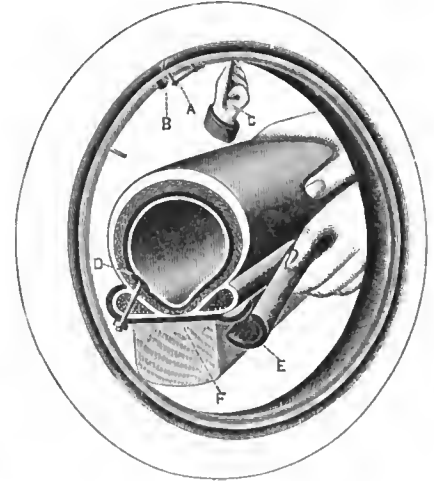


SINGLE AND DOUBLE VICTOR TIRE HOLDERS.

the space on any car. Two qualities of the Victor adjustable tire holder are made, one of the best quality yellow brass composition, finely finished and highly burnished, the other finished in black japan. Each set is composed of three pieces, with straps, as shown in illustration.

Padgett's Detachable Rim.—The object of this invention is to provide a simple and mechanically dependable method of affixing a pneumatic tire to a wheel rim so that it may be readily removed and replaced with a minimum of time and exertion. James M. Padgett, of Topeka, Kan., is the inventor and patentee, and also has other inventions concerning the automobile to his credit, such as the "Stitch-in-Time" vulcanizer for road repairs to tires. As shown by the illustration of the rim, it consists of a band *F* with one outwardly curved edge on one side and regulation clincher retainer on the other, the latter being concaved and having two holes or recesses and a spring and pin *A*, integral therewith. A convex split ring *E* is adapted to engage the bead of the tire on this side, and is provided with a lug *B* at one

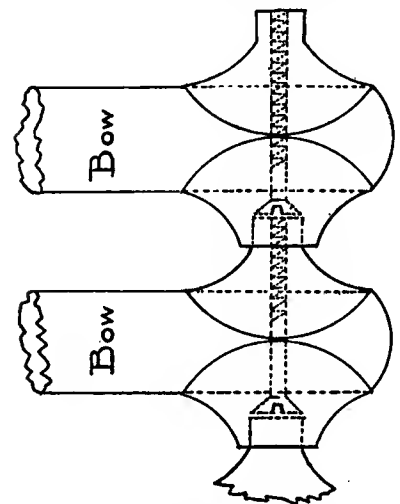
end and a corresponding hole in the opposite end. The operation of removing a tire from this rim simply consists in pressing on the point of the pin *A* until the end of *E* is freed; the latter is then lifted out of the concave recess and the tire may be



DETAIL OF THE PADGETT RIM.

slipped off with the hands. In replacing the tire, the lug *B* is first placed in the recess in the rim, and the flange *E* drawn together when the pin *A* springs into place. The bolt *D* is inserted from the inside of the tire, two or more being used to prevent creeping when run deflated.

Improved Bow Separators.—Under the name of "Stik-Tite," the Michigan Top Company, 14-16 Duffield street, Detroit, Mich., has just brought out a new form of bow separator that is said to be a great improvement over the devices now in use for this purpose. It is the invention of J. W. Decker and consists of two specially shaped pieces that are bolted directly to the bow, so that there is no possibility of their jarring loose or twisting away from the latter. The method of attachment to the bows is shown by the accompanying rough sketch; when the top is not in use and



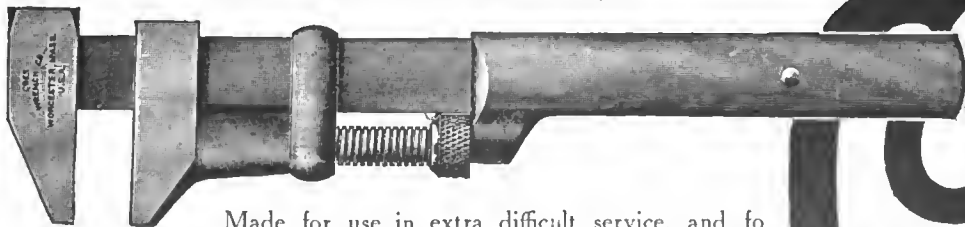
THE "STIK-TITE" BOW SEPARATOR.

the bows are folded back on one another, the use of this device prevents their rattling and banging together and avoids any danger of breaking them in passing over rough roads.

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	Jones, Wm. S. 66	Quinby Co., J. M. 50	Wyman & Gordon Co. 46
	Kalamazoo Spring & Axle Co. 51	Quincy, Manchester, Sargent Co. 54	York Motor Car Co. 52
	Kansas City Motor Car Co. 98		

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COES WRENCH CO., Worcester, Mass.

COES
STEEL HANDLE MODEL
WRENCH

THE AUTOMOBILE



Jersey's Big Club
 Finds Jersey's Roads
 Too Good
 BY
 A. G. Batchelder

A TYPICAL NOONDAY CONTROL—THIS ONE WAS AT FREEHOLD, N. J.

FOR three days the New Jersey Automobile and Motor Club required the participants in its endurance test to keep moving from early morn until late afternoon, but the conclusion found a dozen cars with perfect scores, several with minor losses of points, and only three obliterated from the 26 participants.

Of these, 14 belonged in the touring car class and contended for the possession of the William C. Shanley trophy. Seven survived flawlessly: Matheson, Stoddard-Dayton, Oldsmobile, Grout, National, Knox, and Winton. Incidentally the big National kept its hood on during the entire three days.

In the runabout brigade five of a dozen remained at the head of the class: Stoddard-Dayton, Corbin, Buick, Jackson, and Dragon, the latter handled by the experienced John Haynes and also having come from the factory without the semblance of an innings of testing—green and unlimbered.

It must be confessed that New Jersey's roads average exceedingly well, and, in fact, it is difficult at the present time, while observing the legal limits of speed, to give the present day automobile a question that it cannot successfully answer. Several years ago it certainly would have been another story.

On the first day of the Jersey event the motor-driven vehicles were asked to make the climb of Schooley's Mountain, and none faltered in making the ascent. On to Hackettstown the stone roads were excellent, and the route continued good to Washington, which served as the noon control and replenishing place both for man and machine. Between Washington and Somerville the road was a disgrace to the State Highway Commissioner, but from Somerville back to Newark nothing better could be asked for. The predicted rain failed to materialize, and the day's

enjoyable sort. Perhaps more so to the occupants of the non-schedule-following Frayer-Miller press car, handled expertly, even if occasionally somewhat recklessly, by Raymond Joo, who, I fear, at times slightly exceeded 20 miles an hour.

The return to Newark on Saturday was via Toms River, Lakewood, Freehold, and New Brunswick—139.5 miles—and it was just as thoroughly satisfactory and as completely within the power of the cars as on the previous two days. There were stretches of road with houses few and far between, which made one realize very keenly what a good Vanderbilt Cup course could be obtained in the confines of the "Mosquito State." But we saw no mosquitoes, possibly owing to the fact that the weather was a bit nippy but distinctly bracing for automobilizing. Truly it must have been somewhat irritating for the contestants to observe the exact letter of the law on those long stretches of highway where nothing moving was encountered except the auto in front that gave you its annoying dust.



BONNELL, DIRTY BUT VISIBLY HAPPY.

work summarized found only two missing of the 26 that started in the morning on the 121.9 miles circuit. This was on Decoration Day, which, being a holiday, found the people along the route in a receptive mood for the motor army.

From Newark to Atlantic City via Trenton stretch 154 miles of rattling fine road, and really it was so easy on Friday that it seemed a shame to consider that the task represented by many degrees what might be expected of the up-to-date automobile. Of course, President Walter E. Edge, Chairman Harry Cook, Secretary Johnston, and other members of the Atlantic City Automobile Club, in company with Mayor Stoy, were on hand to give greeting to Chairman Horace A. Bonnell and the pleasure party from Newark, for the day's run had been of the most



"JACK" MASON, ONE OF THE STODDARD-DAYTON PILOTS.

But we of the "press car," unshackled and taking advantage of the situation, passed the whole line, not once but repeatedly. There was Ralph Owen, he of Florida pathfinding fame, complacently jogging along with his Oldsmobile, in the tonneau of which were R. A. Greene and other subdued scorchers. Boland's big National was an unwilling monster held in leash, and "Jimmy" Ryall regretfully kept his Matheson in subjugation. "Dick" Newton, with Mrs. Newton pluckily occupying the rumble seat of the runabout—the observer being alongside the driver—pretended to be pleased with the leisurely pace, and John Haynes, of Vanderbilt Cup notability, waved a smiling salutation, though he must have itched to give his Dragon its head as we flew along. "Jimmy" Ferero, the kid of the run, handled the larger Matheson with a skill that evoked chunks of admiration from hundreds of youngsters, who enviously watched him with wistful eyes. "Jack" Mason had a hard struggle to keep his Stoddard-Dayton in check, and there were a dozen others who suffered similarly. Now and then there would be a burst of speed, but the offender knew that it would mean a funereal pace for him in the last mile before the end of the control, and this thought soon cured the contestants of any "speedstorm."

Infrequently we would run across Chairman Wiss and his Packard, which was a signal for our impatient driver to attempt a demonstration of air-cooling. Since we had a little more horsepower and our pilot had less regard for the law, it usually meant that our next mark was on ahead in the shape of the Thomas car containing Committeemen Wood, Kimber, and Cook, but because it was necessary for them to stop frequently to place road signs, they hardly gave us a run for our money. Vice-President Shanley, donor of the touring car cup, on the previous day had come in contact with a ditch which placed his Mercedes *hors du combat*, but in some miraculous manner the worst that befell us was a couple of tire punctures. Yes, the Frayer-Miller had speed to burn, and a good share was burned.

One of the features of the run was the Holsman, which completely answered the description of a horseless carriage in the



C. H. PECKWORTH WITH A LOAD OF KNOX TRAVELERS.

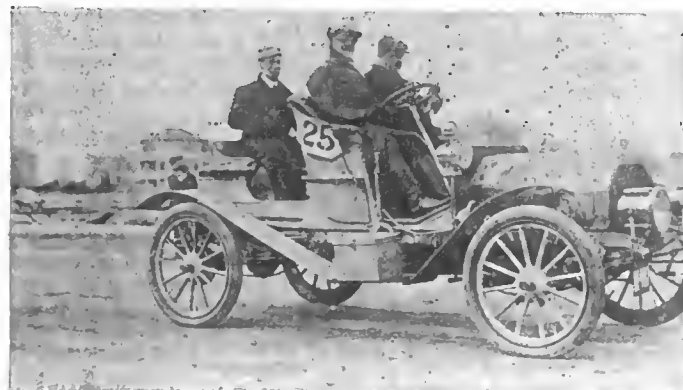
minds of the public, and its appearance was ever a source of deep interest to the farmers who viewed the auto procession. Though it accumulated a loss of points, the total was exceedingly meager, and on the concluding day it reached the finish line half a minute too early.

TOURING CAR CLASS FOR W. C. SHANLEY TROPHY.

Car.	Entrant	Driver	Points Lost.
Matheson	J. D. Ryall	James Ferero	0
Stoddard-Dayton	J. W. Mason	J. W. Mason	0
Oldsmobile	R. A. Greene	Ralph Owen	0
Greut	P. H. Johnston	P. H. Johnston	0
National	F. E. Boland	F. E. Boland	0
Knox	C. H. Peckworth	C. H. Peckworth	0
Winton	C. S. Calvert	C. S. Calvert	0
Maxwell	J. W. Mason	Arthur Durham	2
Autocar	P. H. Seery	Clarence Fisher	10
Thomas Forty	Geo. Paddock	Geo. Paddock	15
Dragon	Henry Setlow	Henry Setlow	50
Cadillac	W. V. Snyder, Jr.	James Ward	122
Doison	W. H. Fulper	W. H. Fulper	D.O.
Corbin	H. J. Koehler	F. L. Apgar	D.O.

RUNABOUT CLASS FOR ANGUS SINCLAIR TROPHY.

Car.	Entrant	Driver	Points Lost.
Stoddard-Dayton	R. T. Newton	R. T. Newton	0
Corbin	H. J. Koehler	J. F. Corbett	0
Butck	H. J. Koehler	M. F. Atgar	0
Jackson	C. W. Oathout	C. W. Oathout	0
Dragon	Henry Setlow	John Haynes	0
Knox	W. H. Ellis	W. H. Ellis	3
Maxwell	J. W. Mason	L. R. Hunt	7
Hewitt	Dr. J. F. Bell	Dr. J. F. Bell	21
Matheson	J. B. Ryall	W. D. Gifford	48
Holsman	S. W. Case	S. W. Case	56
Reo	A. J. Pionnie	Fred Stowers	84
Rambler	C. E. Beach	C. E. Beach	D.O.



JOHN HAYNES WITH THE DRAGON, FRESH FROM THE FACTORY.



THE SEASIDE, ATLANTIC CITY, WHERE THE PARTY RESTED.

Of course, it will not be possible to divide the Shanley trophy into seven parts, nor saw the Sinclair cup into five pieces. Therefore it has been suggested that the names of the winners in each class be engraved on the trophies and certificates be given to the clean score performers. Possibly the two sets of tied contestants may be assembled and a vote taken as to their wishes.

The three-day affair reflected much credit upon the endurance contest committee, and while Chairman Bonnell carried the bulk of the burden he was capably assisted by Committeemen Wood, English, Shanley, Kimber, Wiss, and Cook.

The total mileage of the three days was 415, and the schedule was carefully figured out and made to conform exactly with the requirements of the law. While rainy weather might have interfered to some extent with the most excellent showing, it is pretty good guessing that the tied cars might have been as numerous, for, as has been remarked before, the Jerseymen know the value of good roads, and they have been building them for some years.

fiscal year the effectiveness of this branch of the work may be increased by emphasizing the educational part of the work and increasing the mechanical facilities. To do this it will be necessary for the Government to own the road machinery and have such transportation facilities as to permit an accurate schedule to be followed in carrying on work at different places.



RALPH OWEN, THE OLDSMOBILER.

A plan will then be put into operation by which all of the road overseers in a given county will participate in the object-lesson work at stated times, and a series of practical lectures setting forth the elementary principles governing road construction, as applied to the particular locality in question, will be delivered during the



THE BIG SIX-CYLINDER NATIONAL PASSING THROUGH A CONTROL.

Observing to the letter the present—but some day to be obsolete—speed limits, it would appear to be practically impossible to evolve an eliminating endurance run over as many miles of Jersey road as can be traveled between sunrise and sunset by most autos.



FRAYER-MILLER "PRESS" CAR, WHICH ENJOYED THE FINE ROADS UNHAMPERED BY SCHEDULES

WHAT THE OFFICE OF PUBLIC ROADS IS DOING.

WASHINGTON, D. C, June 1.—Logan Waller Page, director of the Office of Public Roads, has given THE AUTOMOBILE corerspondent an outline of his plans and recommendations for 1908. While the object-lesson method has been in use for some time by the office, it is hoped by Mr. Page and his associates that by the next

construction of each object-lesson road. An estimate has been made for eight additional engineer students. The benefit, both to the government and to the individual student, are so decided as to justify increasing the scope of the work as far as possible.

NATIONAL GOOD ROADS BODY PROPOSED.

A movement is on foot for the formation of a strong national association to deal with the good roads problem, incorporating all existing associations paying any attention to this matter. A preliminary meeting was held last Tuesday at the offices of the National Association of Licensed Automobile Manufacturers, attended by representatives of the A. L. A. M., A. A. A., A. C. A., American Motor Car Manufacturers' Association, and the National Association. Only routine work was done, but it was decided to call a representative meeting at the same place on June 27. There is entire unanimity on the proposition to form a strong representative body, which would be infinitely more powerful than the numerous associations at present working individually on this question.



YOUTHFUL MATHESON "JIMMY" FERERO.

HOW THE LONG ISLANDERS TRIED OUT THE AUTOS *By W.F. Bradley*



SPEEDING ALONG THE ROAD THAT SKIRTS THE SHINNECOCK HILLS—CANOE PLACE INN AT THE RIGHT.

“A GOOD machine that is certain to finish?” repeated the Long Island Automobile Club official.

“Take the Pope-Hartford; Mr. Arnold will be sure to come through with a good score.”

Three minutes later the red machine from Connecticut, with C. G. Arnold at the wheel, a speed-loving architect beside him, and the tonneau occupied by an enthusiastic tire man and a breakfastless representative from *THE AUTOMOBILE*, was running down Cumberland street, Brooklyn, leaving a round dozen cars to follow in its rear.

It was an easy matter to select a car that would finish, and finish without a black spot against it, for of the twenty autos that set out for the club's endurance run only a sprinkling fell by the roadside. To select the one that would comply with all the conditions of the test and finish the run ahead of all competitors in its own and higher classes displayed an acumen on the part of that official which many a racing man would give his shirt to possess. Out through the Plaza, Eastern Parkway and Highland Park the police had not got up, but they had rolled a few boulders into the middle of the highway as a friendly invitation to the autoist that he might speed round them if he wished. It is an excellent idea for obtaining a vicarious service and reflects credit on the bicycle “cop.” When Flushing had seen our tail number the Pope-Hartford began to stretch out to such an extent that the “fifteen an hour” which the regulations demanded appeared as if framed for a cross-town horse-car. Columbia, Aerocar, Thomas, Queen and Olds, in our own class, and Cadillac and Maxwell in Class A, were successively left behind by the Pope-Hartford and its strenuous driver. The last to be overtaken was the Holsman buggy, an early starter which had plodded along with remarkable regularity.

Down Manhasset hill, where the two-wheelers were preparing for their onslaught on speed records, through Roslyn, Glen Cove, Oyster Bay, Cold Spring Harbor, Northport, Stony Brook, then a sharp dip down into Port Jefferson, where our early arrival caused us some difficulty in finding the Miss Smith who had been delegated to feed the troupe. After running right through the village, returning, and taking the ubiquitous small boy on board as official guide, Miss Smith's hotel was discovered where it would have been found at first glance had we not been too eager to arrive first. Hardly had the Pope-Hartford checked in than the Olds, the Thomas, the Cadillac and a number of others lined up. When the hurried lunch had been disposed of and the first arrival was ready to resume its run eastward, all had arrived within the regulation time except F. Rockliff's Aerocar. Rough handling when hard pressed by an inconsiderate buggy driver had caused a smash-up of the transmission and a forced abandonment of the contest when it was barely begun.

We were badly placed for observing the afternoon run. The leading car, our driver was determined to retain his position of honor and left no opportunity of lingering over the beauty spots or going softly where the highways were abandoned for the dirt roads. The route was direct east by Wading River, Riverhead, Mattituck, and Southold to Greenport, where the Pope-Hartford made its first stop of seven minutes to fill up with gasoline and lubricating oil.

Out to Orient Point was a wild rush in which the chickens suffered. The checker was shaving upstairs when we ran into his rear garden, and it was five minutes before he dropped the lather brush to sign the control card. When we turned westward again for the night control at Greenport the most formidable of the competitors, Oldsmobile, Thomas and Columbia, had crept nearer and



WHERE A BREAKDOWN WOULD HAVE BEEN AWKWARD.



AEROCAR STARTING ON THE TWO-DAY RUN.



AIR-COOLED FRANKLIN REACHING GREENPORT.

were passed by us between the two towns. At 1:52 we were checked in at Hedges garage, Greenport, the 139 miles having been covered in 4:51:7. When the others arrived and times were compared, the Pope-Hartford had to abandon its proud position to its half cousin, the Pope-Toledo, which finished in 4:03. Twenty had started out from Brooklyn; nineteen had finished, all of them well within the time limit allowed, and quite a number with clean scores. Their names are:

CLASS A, COSTING UP TO \$1,500, 12 MILES AN HOUR.

Holsman, 10-horsepower; driver, W. J. Hunt.
Cadillac, 10-horsepower; driver, J. D. Rouk.
Maxwell, 16-20-horsepower; driver, I. C. Kirkham.

CLASS B, COSTING \$1,500 TO \$3,000, 15 MILES AN HOUR.

Pope-Hartford, 30-horsepower; driver, Chas. G. Arnold.
Oldsmobile, 40-horsepower; driver, R. E. Pardee.
Thomas, 40-horsepower; driver, W. H. Bower.
Queen, 30-horsepower; driver, A. D. Corwin.
Aerocar, 40-horsepower; driver, A. M. Robbins.
Columbia, 28-horsepower; driver, E. H. Barnum.
Haynes, 30-horsepower; driver, John Sleber.
Franklin, 20-horsepower; driver, R. G. Howell.

CLASS C, COSTING \$3,000 UP, 18 MILES AN HOUR.

Pope-Toledo, 50-horsepower; driver, A. N. Wilcox.
De Luxe, 50-60-horsepower; driver, Chas. Beach.
Matheson, 40-horsepower; driver, R. G. Kelsey.
Packard, 30-horsepower; driver, S. H. Burns.
Pierce Arrow, 40-50-horsepower; driver, A. B. Coles.
Dolson, 60-horsepower; driver, F. A. Cole.
Welch, 50-horsepower; driver, E. L. De Camp.
Winton, 40-horsepower; driver, C. A. Carlson.

Stories over drinks failed to bring any more exciting incidents to light than the sinking of R. G. Kelsey's car into the sand near Fort Salonga, from which position it was rescued by the Welch;

the carrying away of a couple of carriage wheels by R. G. Howell's Franklin, and a might-have-been upset of the Pierce and the Columbia when avoiding other users of the road.

The Homeward Second Day's Journey.

All observers were turned round before the homeward journey began on the following morning, to the delight of those who were dissatisfied with their machines and the regret of those who would leave well alone. In place of the tire magnate, the Pope-Hartford had been given a short-legged Standard Oil potentate as official observer, who smiled approvingly when the speed was moderate in the villages and scowled ferociously when his length, or lack of it, prevented him wedging in securely for the frequent wild runs.

Class B was closely bunched for the first fifteen miles, and we were at least half a dozen who ran into Southold together, where a U. S. official watched the snail crawl, watch in hand. Another half hour and they were all shaken off but the Olds runabout, which hung persistently on our heels. On the dirt road leading to East Quogue the persistent Holsman was passed. The Maxwell, a hundred yards further ahead, could not be got round for ten minutes, owing to the impossibility of finding sufficient width in the hedged-in track.

Over the Shinnecock Hills to Southampton was a magnificent ride with roads that gave sufficiently easy running at fifty an hour to enjoy the beauties of sea and land. Near Bridgehampton's liberty pole the checker recorded the time and the eastward run was begun again with the Shinnecock Inn as noon checking point. There was an exciting little struggle on the moor near the checking station between the Pope-Hartford and



WINTON ON THE SHINNECOCK HILLS, WHERE GOOD ROADS AND FINE VIEWS CHARM THE TRAVELER.



PERSISTENT HOLSMAN WAS A FEATURE.



CLEAN-SCORE POPE-HARTFORD.



MAXWELL, AN EX-GLIDDENITE.

the little Cadillac. Twice the small machine took the lead owing to the Hartford getting on the wrong track, and when the station was reached there was only a difference in our favor of one second, ignored by the checker.

Out from Shinnecock Inn to Brooklyn was a solitary run with no competitors in front and no sight of them in the rear, where the indicator sometimes ran up to "55" and occasionally dropped down to "8," as the nature of the country demanded it. Even the Standard Oil king forgot that he was being tossed about like an abandoned bottle as he exclaimed: "We shall beat all the other fellows by an hour at least." But we did not, for we had not even wiped off the dust when Pardee pulled up his Oldsmobile outside the club premises. De Luxe was at his heels, Pope-Toledo was but ten minutes behind, and Cadillac chuc-chucced in ahead of a lot of the big fellows. Although all the machines had added to the strenuousness of the test by running at a speed far in excess of that demanded by the regulations, there was only one absentee, the Haynes machine, which skidded on a sharp turn at Mattituck, broke a wheel and ditched. The Thomas had a loose connecting rod and came in late in consequence. The Queen had to undergo carbureter adjustments and the Franklin broke its fan. Ten cars, however, finished with clean scores; in other words, ten out of twenty starters covered nearly 300 miles with no stops except at controls and with no other attention than filling the oil and gasoline tanks. It would be impossible to have more convincing proof of the reliability of the modern American automobile.

It remains for the committee to decide how the trophies—the

Brooklyn *Life* Cup, Brooklyn *Eagle* Cup and Shinnecock Hills Cup—shall be awarded, the most probable solution of the difficulty being a final contest between the ten competitors. The machines are placed as follows:

CLASS A, MACHINES COSTING UP TO \$1,500.

Maxwell, I. C. Kirkham, clean score, tied.
Cadillac, J. D. Rouk, clean score, tied.
Holsman lost nine minutes on carbureter adjustments.

CLASS B, MACHINES COSTING FROM \$1,500 TO \$3,000.

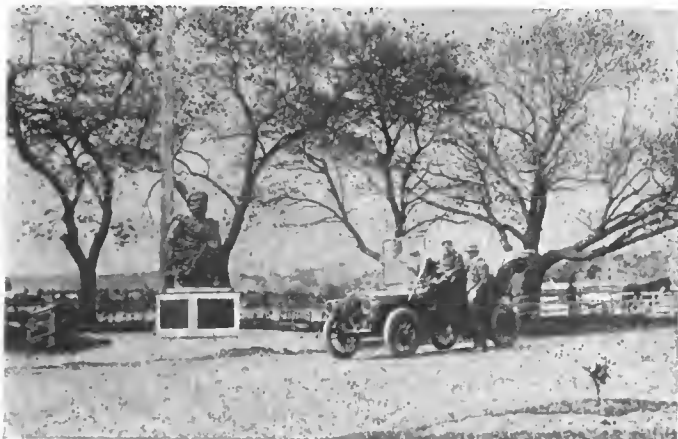
Columbia, E. H. Barnum, clean score, tied.
Oldsmobile, R. E. Pardee, clean score, tied.
Pope-Hartford, C. G. Arnold, clean score, tied.
Queen, carbureter adjustments; Thomas, loose connecting rod; Franklin, broken fan; Haynes, disabled; Aerocar, changed cooling water.

CLASS C, MACHINES COSTING \$3,000 AND UPWARDS.

Matheson, R. G. Kelsey, clean score, tied.
Packard, S. H. Burns, clean score, tied.
Pope-Toledo, A. N. Wilcox, clean score, tied.
Pierce Arrow, A. B. Coles, clean score, tied.
Winton, C. A. Carlson, clean score, tied.
De Luxe and Dolson had carbureter adjustments; Welch broke pin in oiler.

TO HAVE AUTO INSTEAD OF HORSESHOW.

BUFFALO, N. Y., June 3.—President Robert W. Pomeroy, of the Country Club, one of Buffalo's fashionable social organizations, has announced that the club will not hold a horse show this year, as has been the custom. It has been decided to hold an automobile show instead. The date will be announced later.



CHAIRMAN EDWARDS, WHO WAS ALWAYS AT WORK.



LEAVING GREENPORT FOR HOMEWARD JOURNEY.



WALTER C. WHITE IN HIS WHITE STEAMER CLIMBING WILKES-BARRE MOUNTAIN (GIANT'S DESPAIR) IN 1:49 4-5. **EN**

WILKES-BARRE, PA., June 1.—While the mountain back of this city may be the despair of giants, it is just pie for the present-day American automobile. Indeed, after Decoration Day's happenings it might be well to change the name of the crack 6,000-foot hill to "Automobilists' Delight." Certainly every one of last year's records was knocked galley west, and new figures established which it would seem could not be materially bettered—at least for several years.

To illustrate: The course record of 2:11 1-5, held by H. N. Harding's 45-horsepower English Daimler, was lowered to 1:59 2-5 for gasoline cars by J. B. Ryall, driving the 60-horsepower Matheson 1906 Vanderbilt Cup car; to 1:49 4-5 for steam cars, by Walter C. White's 30-horsepower White steamer; and to 1:40 flat for motorcycles, by "Bill" Wray and his 6-horsepower Simplex-Peugeot.

In the event for cars costing over \$5,000, "Willie" Haupt drove his "Great Chadwick 6" to a record of 2:07, as against the English Daimler's 2:11 1-5.

Last year's 2:27 record of the 50-horsepower Stevens-Duryea, driven by S. H. Hancock, was simply smothered by the Great Chadwick, which cut the figures to 2:02 2-5.

J. P. Hardy, in a 25-horsepower Pope-Hartford, knocked 1:12 2-5 off Herbert Bitner's 35-horsepower Rambler record of 3:18 1-5 for cars costing \$4,000 and under when he negotiated the course in 2:05 4-5.

C. W. Hoffman piloted a 30-horsepower Stearns upwards in 2:16 4-5, capturing the event for stock touring cars of all prices and horsepower and completely equipped. In the event for Quaker

City members Hoffman made the ascent in even better time, his figures being 2:13 2-5.

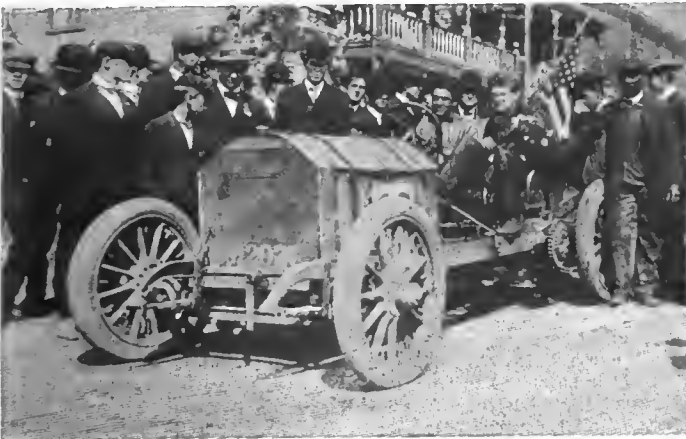
Charlie Soules' record of 2:56 4-5 for cars costing \$2,500 and under, made in a 24-horsepower Pope-Toledo, was lowered to 2:31 3-5 by Guy Hutchinson in a 24-horsepower Corbin.

The record of 2:47 for stock cars costing \$1,000 and under, held by H. J. Koehler in a 22-horsepower Buick, was cut to 2:47 by the 22-horsepower Maxwell, driven by H. A. Grant.

While the improvements made in the course accounts in some measure for the fast time in all the events, the vast improvement in cars and drivers since last year is responsible in great part for the betterment. The Wilkes-Barre Automobile Club spent nearly \$500 in eliminating "thank-you-ma'ams" and widening and banking the road at the "Devil's Elbow" and on the ticklish "S" turn at the Mountain House, while the installation of the electric timing apparatus and the policing of the course cost as much more. But the club's enterprise was well repaid, for the Giant's Despair hill-climb, as a result of to-day's contests, has become the premier fixture of the kind in this country.

But One Discordant Note in Affair.

There was but one discordant note in the management of the affair, and that was the dispute which arose over the barring of steam cars from the free-for-all. It appears that Mr. White had made up his mind some time ago to send several cars to compete in the climb. The entry blanks sent out by the committee, aside from the usual price restrictions, contained no intimation that steamers would be placed in a separate class. Indeed, Mr. White



RYALL'S MATHESON RECORD HOLDER GETS A BOUQUET



C. W. HOFFMAN AND L. D. BERGER'S WINNING STEARNS.



THE LITTLE POPE-HARTFORD ON ITS EYE-OPENING RUN.

avers that the barring of his machines was not decided upon until he had arrived in the city, had had several trials upon the hill and had made it evident that they could cover the ground a trifle faster than the gasolines. Mr. White's contention is borne out in part by a letter, which reached him less than 24 hours before the starting of the first event and which, he declares, was the first official notification he had had of the barring of his entries:

WILKES-BARRE AUTOMOBILE CLUB,
Wilkes-Barre, Pa., May 29, 1907.

WALTER C. WHITE, ESQ.,
Wilkes-Barre, Pa.

My dear Mr. White:—Concerning my conversation with you of yesterday in regard to your entries of White steamers, I am sorry that your entry, being received so late, made it impossible for us to notify you that steam cars had been barred from participation in all gasoline automobile events in the contest to be held May 30th.

This conclusion was reached only after it was found that a large number of gasoline entries could not be received were steam cars allowed to compete in the gasoline events, and, inasmuch as up to that time, May 22, and in fact until May 27, no steam car entries had been received, the Contest Committee could see no other way to accomplish the greatest success of the Meet than to admit the large number of gasoline entries by excluding the steam cars, which is a privilege reserved the committee by the wording of the entry blank, namely, "The right to accept or reject entries is reserved."

However, the club is not indifferent to the fact that you are here with your cars, and that other cars may be here, and to that end has phoned the Quaker City Motor Club to inquire if they will permit steam cars in their classes Nos. 2 and 3, and the writer is advised in the affirmative, understanding, however, that such entries must be made by members of the Quaker City Motor Club. Also, the Contest Committee has added an 11th event to the program for steam cars, offering gold, silver and bronze medals for the winners of first, second and third places, respectively. This event, with a few Quaker City events, offers 10 prizes which are available to be won by steam cars.

If you are agreeable to having your entries transferred to the classes in which the same will be allowed, kindly advise us to that



STRIPPED MAXWELL THAT CLIMBED THE HILL IN 2:47.

effect immediately. We return herewith your original entries and cash deposits which accompanied the same, and also new blanks for you to fill out if the classes may meet with your approval.

Yours truly,
(Signed) P. A. MEIXEL, President.
C.

Mr. White is nothing if not a fighter, and, seeking out the newspaper men at the Franklin Club and the Sterling Hotel, he handed out the following statement:

"Some days ago entry blanks were sent me by the committee and I decided to enter in the free-for-all and in the Quaker City run-about class. I shipped my cars from Cleveland, arriving with them on Monday. I met a member of the committee, and, after a general discussion regarding the contest, filled out the entry blanks and turned them over to him. I then went to the hill and tried out my cars with very satisfactory results. When I returned to my hotel, late in the evening, I learned that Mr. Matheson had tried to get me on the telephone. Tuesday morning, when I went out for practice, several people told me that I was to be barred. These reports, at first incredible, were so persistent that I finally sought out the



SIXTY-HORSEPOWER THOMAS MAKING THINGS HUM.

president of the club, and through him met Mr. Matheson. Mr. Matheson told me that, at a meeting of the committee held last Wednesday night, steam cars had been barred from competing with the gasoline cars. He said that the committee could not get entries of gasoline cars unless this step was taken. I asked why no an-



TAKING DEVIL'S ELBOW AT HIGH SPEED IN A DRAGON.

nouncement of this ruling was ever made or why I had not been previously notified. I am still awaiting the answer.

"I am informed that the Quaker City Motor Club was communicated with, and, with characteristic sportsmanship, said they could see no reason why I should not compete in their event. So I suppose I am all right as regards this event, although, as a matter of fact, the committee has returned to me all of my entry fees. The official program, issued to-day, omits my entry from the free-for-all and inserts it in a class for steam cars which was not even mentioned in the original entry blanks and which I had in no way intimated that I would enter. I have supposed, as has everyone else, that every car which came within the proper price limitations or fulfilled other conditions which were expressly stated, could enter the several classes. Last year, when one of our cars (of much less power) competed, no question was raised regarding its eligibility.

"Who ever heard of barring any car from a free-for-all event? This meet is supposed to be held under American Automobile Association rules, which recognize no distinction as to motive power. In face of all these considerations, to say nothing of the fundamental principle of sport, 'May the best win,' the committee can urge in justification of their action 'only the stereotyped clause that they may 'reject all entries.'

"Furthermore, an over-night change has been made in the conditions governing the award of the Board of Trade cup. While it was formerly to go to the car making the best time, it now appears that my cars are barred from competing for this cup. Where do I stand?"

The committee refused to reverse its action, and yesterday the free-for-all was run off without the steamers, and as Mr. White refused to allow his cars to start in the special steam class in which, he said, they had been entered by the committee without his authority, the latter allowed him a time trial for each of his two cars—the "18" and the "30." The first resulted in a fizzle, its gasoline overflowing and catching fire near the top of the mountain, necessitating a stop and a hurried pushing of the car up to the finish to get it out of the way of the next contestant.

But Mr. White came back strong later in the day, when the second trial resulted in the establishment of a course record of 1:49 4-5 for automobiles, beating the best gasoline time, the Matheson's 1:59 2-5, by nearly ten seconds. Mr. White has an-



THE CORBIN WINNING THE EVENT IN ITS CLASS.



E [COMING OF THE RAMBLER ON A STRAIGHT STRETCH.

nounced his intention of protesting to the A. A. A. Racing Board against his exclusion from the free-for-all, and will ask that the first prize in that event be awarded to him in view of the fact that his car made the best time of the day.



SPEED OF THE STODDARD-DAYTON ON THE STIFF GRADE.

The Contest Committee of the Quaker City Motor Club fully explained its refusal to allow Mr. White to start his cars in its events by referring to a decision made before leaving Philadelphia that only those cars which were driven up from the Quaker City in the club run of that organization would be eligible. This explanation was satisfactory, especially in view of the fact that a Stanley runabout owned and entered by D. Walter Harper, a member, won the Quaker City runabout event in the very fast time of 1:56 4-5.

Surprises Sprung on the Wiseacres.

There were several surprises sprung on the wiseacres, one of them—two of them, in fact—being the winning of both the stock-car-under-\$5,500 and the stock-car-over-\$5,000 events by H. B. Larzelere's 50-horsepower Great Chadwick "6," driven by "Billy" Haupt. In the first-named event the Chadwick climbed to the finish in 2:02 2-5, the gasoline record up to that time and only 2 3-5 seconds slower than the final best figures of the Mathe-

son Vanderbilt car. In the over-\$5,000 event the Chadwick beat out two Mathesons and a Fiat with a run in 2:07.

In the race of the day, the free-for-all, the Chadwick was beaten out by the "60" Matheson, driven by J. B. Ryall, and the "60" Thomas Flyer, driven by M. Roberts, which latter car it had previously beaten in the \$5,500-and-under class. Four of the eight starters in the free-for-all beat the course record of 2:11 1-5—the Matheson, 1:59 2-5; the Thomas Flyer, 2:01 1-5; the Chadwick, 2:05 3-5, and the 25 Pope-Hartford, 2:06 4-5. The performance of the latter car was another surprise. Its comparatively low power put it in the long-shot class but it performed consistently in all the events in which it started. Its win of the \$4,000-and-under class in 2:05 4-5, beating out such veterans as the Thomas 60, the Rambler 35-40, the Oldsmobile 35-40, and the Pennsylvania 35, gave the first intimation of its stability as a hill climber and its triumphs were hailed as a great victory by the "valves-in-the-head" advocates.

One wonderful performance which should be noted was that of "Bill" Wray and his 6-horsepower Simplex-Peugeot motorcycle. THE AUTOMOBILE representative was at the "Devil's Elbow" when Wray made his 1:40 trial, and saw a specimen of dare-devil work which has probably never been excelled in this country. Climbing up the hill at full speed, he took the turn, which is many degrees less than a right angle, without an appreciable let-up, and sped on up and out of sight as a great sigh of relief rose from the more than 10,000 people who had selected that point of the course as the best place to witness possible accidents. The committee had prepared for any emergency of the kind, and had installed an ambulance and temporary hospital at the Mountain House, but, fortunately, they were not called upon.

Apart from the White steamer incident the affair was run off with a promptness and lack of friction which argues well for the



CHADWICK "GREAT SIX" THAT GATHERED IN HONORS.

thoroughness of the preparations. It was no child's play to pull off more than 60 trials in six hours, and keep the course clear and prevent mix-ups. Allowing five minutes to each trial, and keeping all the contestants in each event at the top of the mountain until that event was finished, there were absolutely no delays, and the 30,000 spectators who lined the course had something to keep them busy all the time. Winners and second and third place cars were given blue, red, and white flags as they came down the mountain. Announcements of results and of the next car to essay to climb were made not alone at the start and finish, but at the Elbow, the Mountain House, and at Prospect Rock, so that all along the 6,000-foot route up the mountain the crowds knew just what was going on all the time. Press men and officials were given free access to the course, but at all the points where the crowds congregated the thickest policemen, armed with red flags, kept the people behind the ropes. The officials at the start were congregated on the porch of a little house in the village of Laurel Run, at the foot of the mountain. At the other official stations small wooden stands had been built, all connected by telephone. At the conclusion of the races the management slipped up, not having made any provision for carrying the officials back to their hotels. The latter were equal to the occasion, however, and, pre-empting a water-wagon, were driven triumphantly back to town the observed of all observers.

The winner of the runabout class in the recent Harrisburg endurance run the 30-35 Stoddard-Dayton of E. L. Leinbach, competed in two events and landed one third. The Autocar which won last week's 24-hour Quaker City Derby also took part in a couple of races, but failed to score. The Dragon and the Mitchell which finished fourth and fifth in the twice-round-the-clock event were also there, but failed to bring back a trophy. None of these four cars, however, had been specially tuned up for the climb, all having their usual stock gears and going into the several events in the trim in which they were driven up from Philadelphia.

The success of the Giant's Despair climb was such that the officials of the Wilkes-Barre Automobile Club are positive that the event will become an annual fixture. Although the club is put to considerable expense in preparing the course and returning it to its original shape and although the receipts do not begin to approximate the expenditure, the officials are prepared to run the event annually as an advertisement for their town and their club. As an earnest of their good faith in this matter, they point to many miles of improved roads in and around Wilkes-Barre, not to mention the signboarding of the roads leading into the city. The money of the club and of its individual members has in great part paid for these improvements.

The Summary of the Events.

TIME TRIAL FOR COURSE RECORD (2:11 1-5, HELD BY ENGLISH DAIMLER).

White, 30-h.p.; driver, Walter C. White.....1:49 4-5

FREE-FOR-ALL, STRIPPED AND RACING CARS.

1. Matheson, 60-h.p.; driver, J. B. Ryall.....1:59 2-5
2. Thomas Flyer, 60-h.p.; driver, M. Roberts.....2:01 1-5
3. Great Chadwick 6, 50-h.p.; driver, Wm. Haupt.....2:05 3-5
4. Pope-Hartford, 25-h.p.; driver, J. P. Grady.....2:06 4-5
5. Matheson, 60-h.p.; driver, Chas. Ward.....2:18 4-5
6. Matheson, 60-h.p.; driver, Ross Anderson.....2:28 1-5
7. Maxwell, 22-h.p.; driver, F. Offenhauser.....2:53 4-5
8. Maxwell, 14-h.p.; driver, Chas Fleming.....3:03 2-5

STOCK TOURING CARS, ALL PRICES AND HORSEPOWER, COMPLETELY EQUIPPED AS CATALOGUED.

1. Stearns, 30-h.p.; driver, C. W. Hoffman.....2:16 4-5
2. Stearns, 30-h.p.; driver, Guy Vaughn.....2:19 2-5
3. Pope-Hartford, 25-h.p.; driver, J. P. Grady.....2:39 4-5

STOCK CARS COSTING OVER \$5,000.

1. Great Chadwick 6, 50-h.p.; driver, Wm. Haupt.....2:07
2. Matheson, 60-h.p.; driver, Chas Ward.....2:19
3. Matheson, 45-50-h.p.; driver, Ross Anderson.....2:24 4-5
4. Flat, 35-h.p.; driver, Geo. Kessler.....2:35 4-5

STOCK CARS COSTING \$5,500 AND UNDER.

1. Great Chadwick 6, 50-h.p.; driver, Wm. Haupt.....2:02 2-5
2. Thomas Flyer, 60-h.p.; driver, M. Roberts.....2:05 2-5
3. Stearns, 45-h.p.; driver, Guy Vaughn.....stalled

STOCK CARS COSTING \$4,000 AND UNDER.

1. Pope-Hartford, 25-h.p.; driver, J. P. Hardy.....2:05 4-5
2. Thomas Flyer, 60-h.p.; driver, M. Roberts.....2:06 3-5
3. Knox, 30-h.p.; driver, Wm. Bourque.....2:37 2-5

STOCK CARS COSTING \$2,500 AND UNDER.

1. Corbin, 24-h.p.; driver, Guy Hutchinson.....2:31 3-5
2. Maxwell, 14-h.p.; driver, C. A. Fleming.....2:38
3. Knox, 30-h.p.; driver, Wm. Bourque.....2:41 1-5

STOCK CARS COSTING \$1,000 AND UNDER.

1. Maxwell, 22-h.p.; driver, H. A. Grant.....2:47
2. Maxwell, 14-h.p.; driver, Chas. Fleming.....3:07
3. Buick (1906 G), 22-h.p.; driver, H. J. Koehler.....3:18 3-5

QUAKER CITY TOURING CAR CLASS (FOR MEMBERS OF QUAKER CITY MOTOR CLUB ONLY).

1. Stearns, 30-h.p.; driver, C. W. Hoffman.....2:13 2-5
2. Stanley touring car, 20-h.p.; driver, D. W. Harper.....2:31
3. Autocar, 30-h.p.; driver, J. F. Brown.....3:10

QUAKER CITY RUNABOUT CLASS (FOR MEMBERS OF QUAKER CITY MOTOR CLUB ONLY).

1. Stanley runabout, 20-h.p.; driver, D. Walter Harper.....1:56 4-5
2. Oldsmobile, 35-40-h.p.; driver, T. W. Berger.....2:47 4-5
3. Stoddard-Dayton, 30-35-h.p.; driver, E. L. Leinbach.....2:52 3-5

MOTORCYCLES, FREE-FOR-ALL.

1. Simplex-Peugeot, 6-h.p.; driver, Bill Wray.....1:40
2. Indian (twin-cyl.), 5-h.p.; driver, Oscar Hedstrom.....2:01
3. Indian, 4-h.p.; driver, Jos. McLaughlin.....2:18

AUTO TERRORS HAVE RACES OF THEIR OWN.

Any automobilist who wished to have the pleasurable sensation of seeing a "motor-bike cop" coming toward him at full tilt without visions of a subsequent visit to the police court and its attendant fine could have enjoyed himself to the limit last Saturday at the Empire City race track. There were several score of them there and they discovered that the coppers are good for thirty-five miles an hour without trouble, while Commissioner Bingham also learned things regarding the abilities of this part of the force under his command.

The most interesting event of the day was a fifteen-mile race in which six competitors took part. Patrolmen John Dillon, of the Bronx, and Arthur Innes, of Brooklyn, were alternate favorites for six miles, the latter finally crossing the tape fifty feet ahead of his hanger-on patrolman, S. W. Johnston, of Brooklyn, being a close third. In the first mile of this race the forks of Sergeant McDonald's machine broke, but he escaped injury. The redoubtable Sergeant Casey, whose prowess in this field gave



TWO OF NEW YORK CITY'S NOTABLE "BIKE" COPS.

Sergeant Eugene Casey and Acting Sergeant Benjamin Mallam, recipients of the Automobile Club of America honor medals.

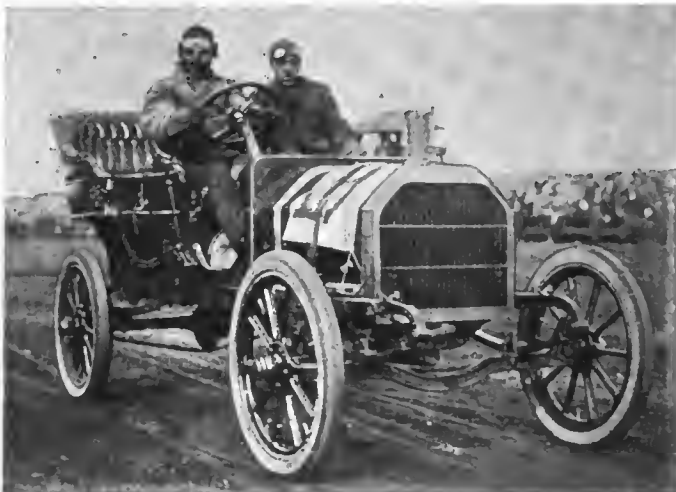
rise to the name "the terror of autoists," was not in good fettle. He entered two races, but was not even placed. Sergeant Anthony Howe was the star of the meet, winning the mile championship in 1:39, the ten-mile handicap from scratch, the five-mile open, the obstacle race, and he was also a member of the winning team in the pursuit race contested for by a New York and a Brooklyn team, Sergeant Mallam being his partner. With the exception of the latter's machine, which was a twin-cylinder Indian, all machines were single-cylinder models of same make.

Special policeman Winthrop E. Scarritt and expert timer S. M. Butler of the A. C. A. were the officers of the meet.

OLDSMOBILE WINS TWICE AT BAY STATE MEET

By C. F. MARDEN.

BOSTON, May 30.—This was Oldsmobile day at the Readville race track, where the Bay State Automobile Association held its annual meet. There were only two events, one at 100 miles for stock touring cars and the other at 50 miles for stock runabouts, and the Oldsmobiles entered by the A. E. Morrison



FALBERTH AND OLDSMOBILE THAT WON THE 100-MILE.

Company won both, establishing a new world's record of 2 hours 10 minutes 30 seconds in the touring car race, and covering the fifty miles in 1 hour 3 minutes 24 seconds, which is also thought to be a record. William Falberth drove the touring car, which went the distance without a falter, reeling off mile after mile as regularly as clock-work. Fred Allen, of Boston, drove the runabout, and its performance was no less consistent than that of the touring car. The two Oldsmobiles were of 35 horsepower, equipped with Diamond flat-tread quick-detachable tires, and it was unnecessary to change a single tire from start to finish.

In the touring car race a 30-horsepower Cadillac, driven by Harry Murch, was second, and a 50-horsepower Frayer-Miller, driven by Fred A. Lewis, the local manager, was third. In the runabout race a 40-horsepower American, driven by W. A. Frederick, won second place, while a Royal Tourist, with Harold D. Church at the wheel, was in third place. There were eight starters in the 100-miles event and eleven in the runabout class, all being gasoline cars with one exception, a steam runabout of 25-horsepower, driven by Bert Holland.

The day was ideal for racing and the track was in the very best of condition. The track had been rolled smooth, and was so thoroughly oiled that the cars, spinning around mile after mile, failed to raise any dust. This gave the spectators a fine view of the races, and despite their length the crowd of over 5,000 people kept up interest throughout the afternoon. Not a single accident marred the day's sport.

At the beginning of this event the 40-45-horsepower Jackson had jumped into the lead, closely pursued by the Oldsmobile and the American. Robert Burnham was at the wheel, and by skillful driving and a remarkable show of speed he succeeded in lapping his nearest competitor in the first twenty-five miles. Holland had been unable to get his Stanley going well at the beginning, but when he was about twenty miles and the Jackson at twenty-five or six, the steamer got into shape, and Holland started out to make up for lost time. He took the Jackson for a pacemaker, and after chasing it for several miles eventually got ahead. Then it was nip and tuck, mile after mile, not more than fifty feet separating the two cars at any time.

A. E. Morrison, besides his Oldsmobile entries, had a Stearns

30-horsepower stripped touring car in the 100-miles race, which he drove himself. At the very start he gained the lead, and by cutting out a terrific pace succeeded in gaining regularly every lap until, at thirty miles, he had a lap or two on the Oldsmobile and the Cadillac. His driving was one of the best exhibitions of the day, and he was looked upon as an almost certain winner. In attempting to pass two cars on the lower turn, however, one of his tires flew off. He completed the lap, however, replaced the tire and was again in the race, having third place at thirty-five miles. His luck was against him, however, for he had more trouble, and though he kept at it he had to make frequent stops and eventually finished sixth. Harry Murch drove a heady race with his Cadillac, rarely varying the speed from round to round. The Dragon, driven by John Liffike, of the Dragon Automobile Company, and the Grout, driven by K. A. Grout, kept on very even terms mile for mile but the Grout won fourth place and the Dragon fifth. The 20-24-horsepower Jackson was seventh and the Moon was eighth. The position of the Moon was due to bad luck, as Neilsen drove a fine race. Summaries:

One Hundred-Mile Race for Stock Touring Cars.

Place	Car	Driver	H.P.	Time
1	Oldsmobile	W. Falberth	35	2:10:30
2	Cadillac	H. Murch	30	2:16:55 1-5
3	Frayer-Miller	F. A. Lewis	50	2:38:30 1-5
4	Grout	K. A. Grout	35	
5	Dragon	J. Liffike	24	
6	Stearns	A. E. Morrison	30	
7	Jackson	E. P. Blake	20-24	
8	Moon	V. A. Neilsen	30-35	

The times of the winning car at intermediate distances were: 25 miles, 32:10 2-5; 50 miles, 1:05:09 2-5; 75 miles, 1:37:48 4-5; 85 miles, 1:50:55 1-5.

Fifty-Mile Race for Stock Runabouts.

Place	Car	Driver	H.P.	Time
1	Oldsmobile	Fred Allen	35	1:03:24
2	American	W. A. Frederick	40	1:04:45 1-5
3	Royal Tourist	H. D. Church	40	1:08:52 1-5
4	Stanley	Bert Holland	25	
5	Jackson	Robert Burnham	40-45	
6	Corbin	J. W. Swan	24	
7	Grout	C. B. Grout	35	
8	Crawford	G. M. Wetherbee	45	
9	Knox	A. E. Dennison	30	
10	Dragon	E. O'Donnell	24	
11	Logan	E. P. Blake		

The times of the winning car at intermediate distances were: 5 miles, 6:48; 10 miles, 13:08 2-5; 15 miles, 19:35 3-5; 20 miles, 25:49 1-5; 25 miles, 32:04; 30 miles, 38:07 2-5; 35 miles, 44:28; 40 miles, 50:58 2-5; 45 miles, 57:09 4-5.



FRED ALLEN AND HIS WINNING OLDSMOBILE RUNABOUT.



GRAND LINE-UP OF THE OLD AND NEW, FAST AND SLOW, OF THE OLDSMOBILE CLAN AT EMPIRE CITY CRACK.

OLDSMOBILERS GET TOGETHER AND CELEBRATE

If one had found himself put down unexpectedly at the vicinity of Fifty-second street and Broadway on Memorial Day morning he would certainly have gained a strong impression that all the automobiles in New York were Oldsmobiles. There were Oldsmobiles here, there and everywhere—the entire neighborhood was preempted by Oldsmobiles of all vintages and they kept coming steadily, until when the time for the parade to the Empire City track came to start there were some 300 of them to fall in line. It was Oldsmobile day, the only event on the program not participated in by the Oldsmobilers themselves being an exhibition 15-mile drive by Cadrino in the Fiat, Jr., in which he succeeded in lowering his previous record by a substantial margin. The Italian did every one of the fifteen miles under the 60 second mark and established new world's records for 10 and 15 miles by a medium weight car on a circular track. The 10-mile mark was passed in 9:47 1-5 and the total distance was covered in 14:45. The previous records for both distances were held by Bernin in a Renault.

Among the regular events on the program, an Australian pursuit race easily carried off all the honors in point of interest. It was also dubbed the Hare and Hounds race and consisted of starting four cars at the quarter mile posts, the winner to be he who first passed the other three contestants—the old unlimited pursuit race of bicycling days. D. Bruce Brown started from the tape, C. L. Waterbury at the first quarter pole, J. Augustine at the half mile, and Dr. J. P. Thomas at the three-quarter. Augustine was eliminated by Waterbury at the end of 2 1-4 miles, the next to drop by the wayside being Dr. Thomas, who was passed by both the remaining contestants simultaneously after he had completed 5 1-2 miles. Waterbury held out gamely for three-quarters of a mile further and Brown's efforts to get by him aroused a great deal of interest, finally succeeding right in front of the stand and just before completing the seventh mile. Time, 7:36 4-5.

Honors in the one-mile race for curved dash runabouts were carried off by John W. Colby, of Norwalk, Conn., in 2:42 2-5; J. J. Durand and Fred Holbrook, both of New York City, coming along in the order named. The two-mile event for 1906 roadsters was won in 2:47 1-5 by C. Allan Hudson, of Westbury, Long Island, with L. R. Adams, of the Long Island Automobile Club, second. After making a false start and being compelled to come back to the line, Oliver Light, of Dobbs Ferry, overcame this ill omen and captured the mile race for 1906 touring cars in 1:35 4-5; J. H. Walsh, Elmhurst, Long Island, was second, and J. J. Durand third. L. E. Bamberger, of New York, took the two-mile race for 1907 touring cars in 3:20 1-5; Tunis Speare and Allan Hudson, both New Yorkers also, coming in second and

third. The last event on the large car program was a three-mile event for 1907 roadsters. It was won by D. Bruce Brown in 3:48 2-5, with C. L. Waterbury second, and F. G. Schmidt third.

Something that promised to be of considerable interest was the "progress race" between a 1903 curved dash runabout of the single-cylinder type and a 1907 roadster, the former being driven by a diminutive youth of the name of Edward Steurwald, while the roadster was piloted by Tunis Speare. According to the program, the new car had to make two laps to the ancient one's single time round, but evidently no one had made very painstaking calculations as to their relative ability, for the arrangement fell short by half, the new car completing two miles in 2:51, while the veteran required 5:15 to do the same distance, or about four laps to one.

The crowning event of the day was the drawing for a 1907 Oldsmobile; there were some 300 numbers to be drawn, each owner being entitled to an opportunity to test his luck. The good fortune fell to Lindsley Tappin, a young New York stock broker, who chose an Oldsmobile roadster as his prize. The other prizes consisted of silver cups, and as arrayed along the fence by the host of the day, Gen. John T. Cutting, made an impressive showing. They were awarded as fast as the events were run off.

The summaries follow:

ONE MILE, SINGLE CYLINDER RUNABOUTS.

1. John W. Colby, Norwalk, Conn.....2:42 4-5
2. J. J. Durand.
3. Fred Holbrook.

TWO MILES, 1906 ROADSTERS.

1. C. Allen Hudson.....2:47 1-5
2. J. R. Adams.

ONE MILE, 1906 TOURING CARS.

1. Owner, H. T. Clinton; driver, Oliver Leighton.....1:35 4-5
2. John H. Walsh.
3. J. J. Durand.

TWO MILES, 1907 TOURING CARS.

1. Owner, L. E. Bamberger; driver, G. S. Richardson.....3:20 1-5
2. C. Allen Hudson.
3. Tunis Speare.

THREE MILES, 1907 ROADSTERS.

1. D. Bruce Brown.....3:48 2-5
2. C. Allen Waterbury.
3. F. G. Schmidt.

FIFTEEN-MILE EXHIBITION AGAINST MIDDLEWEIGHT CAR RECORDS BY CEDRINO, DRIVING 24-HORSEPOWER FIAT JUNIOR.

One mile, 0:59 3-5; 2 miles, 1:57 4-5; 3 miles, 2:57 2-5; 4 miles, 3:56 1-5; 5 miles, 4:54 4-5; 6 miles, 5:53 1-5; 7 miles, 6:52; 8 miles, 7:50 3-5; 9 miles, 8:48 2-5; 10 miles, 9:47 1-5; 11 miles, 10:46; 12 miles, 11:45 2-5; 13 miles, 12:44 1-5; 14 miles, 13:44 2-5; 15 miles, 14:45. New records established from 10 to 15 miles inclusive.

HARE AND HOUND RACE, FOUR STARTERS AT ONE-QUARTER-MILE DISTANCES, WINNER TO BE FIRST TO PASS THREE CARS.

1. D. Bruce Brown in .6 miles.....7:36 4-5
2. C. L. Waterbury.
3. Dr. Julian P. Thomas.

HOW THEY CLIMBED THE HILL AT BRIDGEPORT

BRIDGEPORT, CONN., June 3.—With Joe Tracy as a drawing card, the success of the Bridgeport Automobile Club's hill climb at Sport Hill, Easton, last Thursday, was assured. The weather gods were propitious and interest in the event did the rest, so there was nothing left to be desired; the spectators lined the entire course many deep at all points. The contest was in charge of A. L. Riker as referee, who managed the affair superbly, while the arrangements worked out by Chairman Ralph M. Sperry and his committee made things go like clockwork.

The Stanley steamer carried off the honors by making the distance in 1:24 2-5, with a big Stearns as next best in 1:25 flat. Tracy had originally been down to drive the Locomobile as a contestant, but Mr. Riker, not considering that the entry and his position as referee were consistent, decided to withdraw the car, so that the latter was merely sent over the course against time, the result being a tie with the Stanley. Most of the spectators and club officials were confident that Tracy could pilot the Locomobile over the course in better time and urged Mr. Riker to consent to a second trial, which was not granted.

The hill is characterized by a nasty S turn at the top and on this some came to grief. A Pope-Hartford car with H. P. Seymour, assistant superintendent of the Pope factory, at the wheel suffered the most severely, but strange to say, this accident occurred on the only straight stretch of the course and in plain view of the judge's stand. Seymour was going at a terrific clip and had the best time of the day beaten by at least fifteen seconds, when he lost control as the result of the car's jumping into the air in crossing a gully. It leaped the ditch, barked a big maple, skinned a second and made its finale at the inevitable telegraph pole. Seymour was thrown some distance, but was only slightly dazed. The only other accident of the day happened to W. Irvine Fickling's Stearns, which bore the magic number 23. It got away from the start in a manner that befitted its entry numeral, but came to grief a short distance up the road, with two bursted tires on the front wheels. The axle and front wheels of the car were removed and those of Mr. Fickling's touring Stearns substituted, the car subsequently making the distance against time and doing it in 1:25 or but 3-5 of a second off the day's record.

The day's program consisted of five events for the different classes of cars and one for motorcycles. A silver cup was put up

for each event, that in class one being captured by a 12-horsepower Maxwell, driven by Mr. Watson, of Pawtucket, R. I. He was the first starter of the day and covered the course in 2:06. Ralph Sperry, driving a 15-horsepower Ford, was the only other entrant and did it in 2:18. This was for cars under \$1,000.

In the second class Harry D. Gates, of the Fairfield Auto Company, captured the prize in a 12-horsepower Reo.

The third class for cars from \$2,000 to \$3,000 brought the record down to 1:40, which was made by Herbert Seymour in a 30-horsepower Pope-Hartford.

Class four was without limit above the minimum of \$3,000 and provided more interest than its predecessors. The honors were taken by Nat Bishop's 50-horsepower Simplex, with John Woods at the wheel, crossing the line in 1:37 3-5, while T. W. Pearsall's Packard 30 did it in 1:41 3-5.

The free for all was the real event of the day, a Thomas leading off with a performance of 1:30 1-5; the Stearns came next, but butted the bank, then the little Stanley cleared the field by roming over the line in 1:24 2-5. The summaries:

CLASS ONE.—STOCK CARS COSTING \$1,000 OR LESS.

1. Maxwell, 12-h.p.; driver, Mr. Watson.....2:06
2. Ford, 15-h.p.; driver, Ralph Sperry.....2:18

CLASS TWO.—STOCK CARS COSTING \$1,000 TO \$2,000.

1. Reo, 16-h.p.; driver, Harry D. Gates.....2:19
2. Reo, 16-h.p.; driver.....2:27
3. Jackson, 20-h.p.; driver, Arthur W. Bell.....2:30

CLASS THREE.—STOCK CARS COSTING \$2,000 TO \$3,000.

1. Pope-Hartford, 30-h.p.; driver, Herbert Seymour.....1:49
2. Oldsmobile, 40-h.p.; driver, Mr. Lyford.....2:12
3. Continental, 30-h.p.; driver, Mr. Johnson.....2:12

CLASS FOUR.—STOCK CARS COSTING OVER \$3,000.

1. Simplex, 50-h.p.; driver, John Woods.....1:37 3-5
2. Packard, 30-h.p.; driver.....1:41 3-5
3. Packard, 30-h.p.; driver, John Woods.....1:46

CLASS FIVE.—FREE-FOR-ALL AND RUNABOUTS TO \$6,000.

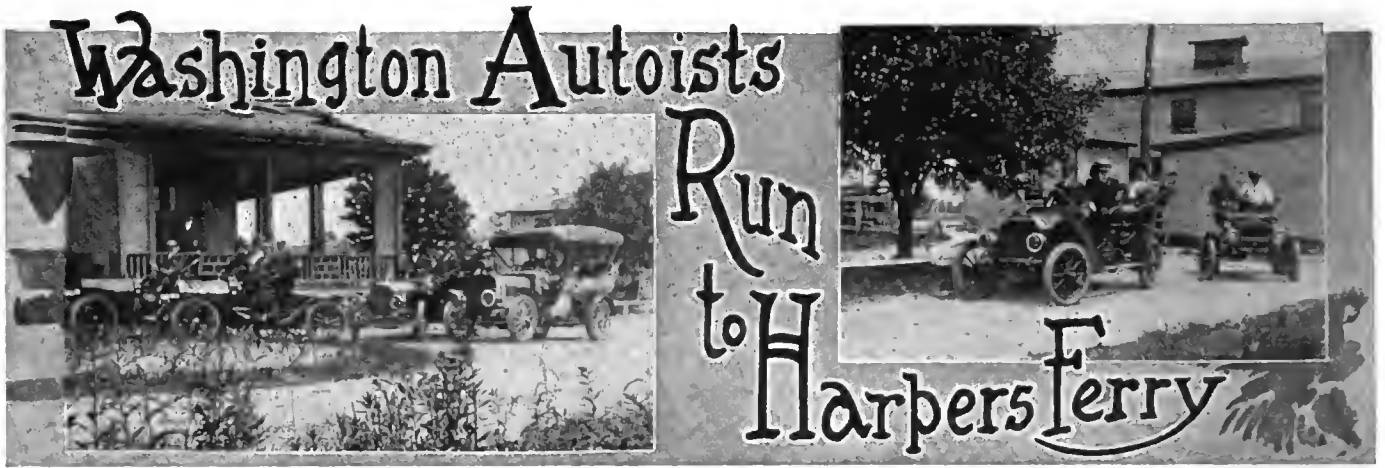
1. Stanley, 20-h.p.; driver, C. S. Bragg.....1:24 2-5
2. Locomobile, 40-h.p.; driver, Joe Tracy.....1:24 2-5
3. Thomas, 60-h.p.; driver, George Townsend.....1:30 1-5
4. Stevens-Duryea, 50-h.p.; driver, R. B. Crawford (protested).....1:32 3-5
5. Stearns, 60-h.p.; driver, W. I. Fickling (protested).....1:25
6. Oldsmobile, 40-h.p.; driver, J. W. Burrall.....1:36 2-5
7. Thomas, 40-h.p.; driver, Kenneth McNell.....1:46 1-2
8. Continental, 30-h.p.; driver, Mr. Johnson.....1:52 3-5
9. Thomas, 60-h.p.; driver, G. Townsend.....2:02
10. Oldsmobile, 40-h.p.; driver, F. W. Williams.....2:28 1-5
11. Berliet, 40-h.p.; driver, W. J. Morden.....1:51 1-2

CLASS SIX.—MOTORCYCLES.

1. Indlan, 2 1-4-h.p.; ridden by Peter H. Cox.....1:30
2. Curtiss, 5-h.p.; ridden by C. Edward Clark.....1:31 1-5



JOE TRACY CLIMBING SPORT HILL AT BRIDGEPORT, CONN., MEMORIAL DAY, IN HIS 40-HORSEPOWER LOCOMOBILE.



SECOND SECTION LEAVING THE CLUB HOUSE.

PRESIDENT CAVERLY AND SECRETARY MARK BLAZED THE WAY.

WASHINGTON, D. C., June 3.—Harpers Ferry, W. Va., was the objective point of the initial run of the year of the Automobile Club of Washington, held May 29-30. Numerically, and in every other way, it was the best run the club has ever had, and has caused many members who have been heretofore lukewarm on the touring proposition to become enthusiastic over the delights of touring. The future runs of the club, and a number of very interesting ones, have been planned, will doubtless bring out the full strength of the club.

The start was made on the afternoon of May 29 from the club's country home on the Brightwood road. President Caverly, in an Oldsmobile touring car, and Secretary Mark, in a Maxwell, blazed the way, and were followed in quick succession by the balance of the party. The route was out the Brightwood pike to Olney, where a sharp turn to the left was made. Ridgeville, about thirty-four miles out, was the first stop.

The roads were in excellent condition, barring the numerous waterbrakes that are encountered throughout the entire journey. The grand old woods of Maryland, the sloping hills, the pretty streams, the fertile lands, the prosperous farms and homesteads, the ancient landmarks that date back to the days of the Revolution, make this one of the most interesting routes leading out of Washington. At Ridgeville the tourists struck the National Pike, and from this point they followed the route to Harpers Ferry so ably described, pictorially and otherwise, by "Pathfinder," in the May 9 issue of THE AUTOMOBILE.

Harpers Ferry was reached at 6 o'clock, the seventy-three miles being covered in five hours, including stops made at Ridgeville and Frederick. The Hill Top House, one of the highest points above Harpers Ferry, cared for the party, Proprietor Loving leaving nothing undone that would add to the pleasures of the tourists. The homeward trip was begun on the afternoon of Decoration Day, the clubhouse being reached at dusk.

THOMAS "SIXTY" WINS BENNING'S "HUNDRED."

WASHINGTON, D. C., May 31.—Two automobile races and a motorcycle race comprised the program offered by the United States Motor Racing Association at the Benning's race track, Decoration Day. The principal event was the District Endurance Derby at 100 miles, open to touring cars and touring runabouts of 60-horsepower and under. It was won by W. C. Hood in a 60-horsepower Thomas in the fast time of 2:12:43. A. L. McCormick, driving a 35-40-horsepower Oldsmobile, was second, and J. A. Lutz, also in a 35-40-horsepower Oldsmobile, was third, their respective times being 2:22:11 and 2:26:38.

There were seven starters, the others being R. Mongini, 30-horsepower Columbia; Mrs. Cuneo, 45-horsepower Rainier; Howard Gill, Thomas "Forty," and Jack Conway, 50-horsepower Thomas. Hood took the lead from the start and was never headed, although Conway pushed him hard for fifty miles. The latter then began to have trouble, finally withdrawing at the end

of the seventy-sixth mile. Mrs. Cuneo, making her first appearance in Washington, created quite a sensation by her daring driving. She was in bad at the start, one of the four cylinders of her car being put out of commission before the end of the first mile. Tire troubles also caused her to make two stops, but she pluckily went the entire route. Mongini also finished, and made a hit with the crowd by his clever driving.

Hood also walked away with the other automobile event, which was at ten miles for the District championship. He drove the same car as in the 100-mile event and finished in 6:28, Jack Conway getting the place, with Howard Gill third. Mangol won the three-mile motorcycle race on an Indian; time, 4:11.

About four thousand people were present, but it is reported the promoters are not satisfied with the showing made in Washington, and will drop this city from the circuit. The weather was ideal, but there were many counter attractions that served to keep down the attendance.

MOTORCYCLISTS STORM MANHASSET HILL.

This year, in holding its fifth annual hill climb, the New York Motorcycle Club co-operated with the Brooklyn Motorcycle Club and the joint affair was held on Manhasset Hill, a twisting rise of stiff grades on the road between Manhasset and Great Neck, a short distance out on Long Island. Stanley T. Kellogg, of Springfield, Mass., whose name has always figured well up on the lists of the winners at every motorcycle meet, made a good attempt at maintaining his record in this respect by carrying off the first in the leading event for machines in Class 1, reaching the top of the hill on his 2¼-horsepower single-cylinder Indian in the good time of 1:14 4-5, while he took second in all the remaining events. The sharp turns of the hill proved too much for some of the riders, two of whom went down.

The winner in Class 2 was Albert Book, on a 4-horsepower twin-cylinder Curtiss, in 1:04 1-5, while G. H. Curtiss came in first in both Classes 3 and 4 on a 7-horsepower Curtiss in 0:55 and 0:56 1-5, respectively. The summaries follow:

CLASS I

1. Stanley T. Kellogg, 2 1/4-h.p. Indian..... 1:14 4-5
2. Percy J. Drummond, 2 1/4-h.p. Indian..... 1:15 2-5
3. B. S. Barrows, 1 3/4-h.p. Indian..... 1:19 2-5
4. George W. Holden, 1 3/4-h.p. Indian..... 1:21 2-5

CLASS II

1. Albert Book, 4-h.p. Curtiss..... 1:04 1-5
2. Stanley T. Kellogg, 2 1/4-h.p. Indian..... 1:17
3. Fred Littlefield, 4 1/2-h.p. F. N..... 1:17 4-5
4. George W. Holden, 1 3/4-h.p. Indian..... 1:18

CLASS III

1. G. H. Curtiss, 7-h.p. Curtiss..... 0:55
2. Stanley T. Kellogg, 4-h.p. Indian..... 0:59 4-5
3. Percy J. Drummond, 3 1/2-h.p. Indian..... 1:01 4-5
4. J. P. Bruyere, 7-h.p. Peugeot..... 1:09 1-5

CLASS IV

1. G. H. Curtiss, 7-h.p. Curtiss..... 0:56 2-5
2. Stanley T. Kellogg, 8-h.p. Indian..... 0:58 1-5
3. Albert Cook, 4-h.p. Curtiss..... 1:03
4. J. P. Bruyere, 7-h.p. Peugeot..... 1:10 2-5



AUTO RECOGNIZED AS A LEGITIMATE ENGINEERING STUDY

BY Charles B. Hayward

INDIANAPOLIS, IND., June 1.—For the first time in its history, the American Society of Mechanical Engineers has officially set its seal of approval on the automobile by recognizing the fact that it is a legitimate subject for engineering study. This means more than would appear at first sight, for in the history of the organization in question is written much of that of mechanical engineering as a whole in this country.

Wednesday was automobile day and the afternoon was devoted to visits of inspection. There was the alternative of taking in the plant of the Atlas Engine Works and with it that of the National Motor Vehicle Company, or of making a visit to the Nordyke & Marmon Company and another concern. A rising vote taken at the morning session was practically unanimous in favor of the former, and the engineers, three hundred strong, were toted out to the suburbs in special cars provided by the trolley service. The Atlas Engine Works are one of the oldest builders of steam engines and boilers on this side of the Atlantic, and in the widespreading plants, with hundreds of engines of all sizes in every stage of construction, the engineers found themselves in a familiar element. Though pioneers in the steam engine field and one of the large factors in it to-day, these builders have looked ahead and, recognizing the inevitable, have prepared for it. The gas engine department has already assumed large proportions and active preparations are now said to be under way, looking to the manufacture of automobile motors on a large scale. As has been its policy heretofore in the steam and gas engine field, nothing but the engines themselves will be built and they will be put through in quantities.

First Visit to an Automobile Factory.

From the Atlas works to the plant of the National Motor Vehicle Company is but a few minutes walk, and the engineers bent their steps in that direction with an eagerness born of curiosity, for they were about to enter upon what was to them an entirely novel field. The National people had taken this into account, for in addition to providing a liberal quantity of circus lemonade, they detailed several of their own engineering force to act as pilots and explain things. It was a pretty warm day and the pink lemonade was a welcome cooler after a trip through

a big foundry, but the "Explanationers" proved the most welcome bit of foresight on the part of the entertainers, for the visitors with few exceptions were like so many schoolboys when it came to things automobile. It was really more entertaining to watch the entertained than to try to take in the details of the plant itself. A group formed with a six-cylinder National chassis as its center was a point of interest to which I attached myself and was well rewarded. Its members had been admiring the compact and finely finished power plant concentrated in such a small amount of space and with no superfluous detail, when one of them—a big, husky fellow who looked as if he could have walked off with the engine under his arm without much difficulty—took occasion to ask what the power of the motor was.

"Seventy-five horsepower," replied the automobile engineer nonchalantly. "Seventy-five!" his interlocutor almost gasped. "But do you mean *brake horsepower*?" he came back, his look of incredulity reflected in the faces of the entire circle.

"Oh yes, they have to tune up better than that on the brake test in order to pass inspection. We have had them show as much as ninety horsepower on the brake for very short periods, but all of them exceed their nominal rating on test by at least ten to fifteen per cent."

With visions of the two or three tons of metal that represent the groundwork of a stationary engine of similar capacity in mind, the engineering contingent could only express its admiration and wonder in dumb amazement. Passing on through the various departments, chassis frames were felt and examined with many a headshake over the slightness of the metal forming their members, the gear and dashboard castings were toyed with, marveling at the great discrepancy between their bulk and avoirdupois like so many schoolboys.

Close Study Devoted to Details.

Next to the motors and the chassis in course of erection, which were probably the most unfamiliar objects, the details of the change speed gear and the rear axle unit came in for attention, for here at least was something more familiar though its application was a decided novelty. Here again the features of compactness, the ingenuity shown in design and operating methods



ONE OF THE INSTALLMENTS AT THE NATIONAL WORKS.

as well as the lavish use of the most expensive metals and jewel-like ball bearings called forth no end of admiration. They were at a disadvantage, these engineers. They had to let their guide talk without being able to do much talking back, for in all the interested groups I took in I only ran across one who could talk automobile through being the possessor of a car. Probably there were others, but for the most part the visit represented an initiation to the genesis of the automobile. The testing cars with their rough and ready fittings and the dynamometer rigged for testing the power output at the driving wheels of the completed car represented objects of unending interest.

Motors Under Test Proved Instructive.

As they finished their rounds of inspection of this part of the plant, the various installments were bundled into waiting cars and given a two or three-mile drive through the residential section of the city over to the motor-building department of the National works. The transportation of such a contingent naturally taxed the facilities of the plant to provide cars, and a Premier or two, with a Rambler, formed a scattering representation loaned for the occasion to help out. If anything, this part of the plant was more interesting than that in which the complete cars were assembled. Here the motors were to be seen at every stage in the process of construction, from the rough casting straight from the foundry to the complete motor on the testing block, and a dozen or more of the latter of both fours and sixes that were running full blast at the same time gave some idea of the rate at which they were being turned out. The center of attraction in the long testing room was the electric dynamometer with its water resistance to absorb the power developed. A four-cylinder motor was undergoing test at the time and the attendant in charge put it through its paces for the benefit of the visitors. The inspection completed to the satisfaction of all concerned, the roar of the testing plant was left behind for another ride in the cars back to the Claypool, giving an excellent opportunity to take in the fine four and a half mile oiled boulevard. Your Indianapolis chauffeur is a true representative of the genus—he lets her out whenever an opportunity offers, but he can pick up the scent of a mounted copper just as far away as any of his kind, and the discreet pace and solemn mien with which he passes the stern-visaged minion of the law are models of innocence and propriety, not but that the peeler has his own suspicions and he shows it, too, but he has to land the sinner "with the goods."

During the afternoon the "lady engineers" had not been forgotten, the same contingent of cars that was later impressed into service between the departments of the National works and as transportation back to the hotel were marshaled along the curb at the latter and used to carry bunches of fair femininity out

to the Indianapolis Country Club. When the ladies returned in the evening they were of one opinion that arrangements could not have been engineered more efficiently nor pleasantly, due to the energy and foresight of Mr. Wall, of the sales department of the National company, who was in charge of the automobile transportation arrangements for the whole contingent.

Papers Were of Absorbing Interest.

The Wednesday evening session was devoted to the reading of papers by engineers who have long been identified with the progress of the automobile. The papers presented were those on "Bearings," by Henry Hess, of the Hess-Bright Manufacturing Company; "Special Steels," by Thomas J. Fay, and "Materials for Automobile Work," by Elwood Haynes, of the Haynes Automobile Company, one of the deans of the American industry. Mr. Hess' paper was profusely illustrated with lantern slides, showing current types of gear-set construction and mounting as exemplified by the best in American and foreign practice, ball-bearing crankshafts of various types, and the like.

Mr. Fay's paper brought home for the first time to mechanical engineers who have only known the automobile as laymen the tremendous amount of work that has been concentrated on the study and production of special steels in a few years as the result of the widespread and pressing demand for automobile construction, while Mr. Haynes' lengthy experience in automobile building was reflected in his able outline of the subject of materials, dating as it does back to the time when the very commonest necessities of automobile construction were unknown and manufacturers had to turn out everything they needed down to the most rudimentary detail. All the papers proved of absorbing interest. John Wilkinson, of the H. H. Franklin Manufacturing Company, was down for a paper on the "Air-Cooling of Automobile Motors," and B. D. Gray, of the American Locomotive Works, for one on "Railway Motor Cars," but, unfortunately, neither was able to be present.

Of course, there were meetings and the like scheduled for Thursday, but an event that was not down on the program took the attention of the engineers in a body during the afternoon. President Roosevelt arrived in Indianapolis in the morning and after being escorted about by an imposing parade took part in the unveiling ceremony of the Lawton monument, and the engineers came early to listen to his speech. On Friday the whole contingent went to Purdue University at Lafayette, where the papers on superheated steam were read, points on superheated steam practise as exemplified in the White automobile being brought out in the discussion. An impromptu visit by some of the engineers to a nearby chicken factory was not on the program either and resulted in a learned discussion of the thermal efficiency of the incubator and brooder.



PRESIDENT ROOSEVELT "SPEECHIFYING" AT LAWTON MONUMENT.

AIR COOLING OF AUTOMOBILE ENGINES*

By JOHN WILKINSON, CHIEF ENGINEER. H. H. FRANKLIN MFG. CO.

THE result always first met by the investigator of the air-cooled engine for automobile work has been that the motor became too hot for proper operation, and therefore the problem has been to find out how overheating manifests itself and how to overcome the fault.

2. Overheating shows itself in quite a number of ways. The cylinder may become so hot that as a result the incoming gases expand so much that there is a reduction in power owing to the

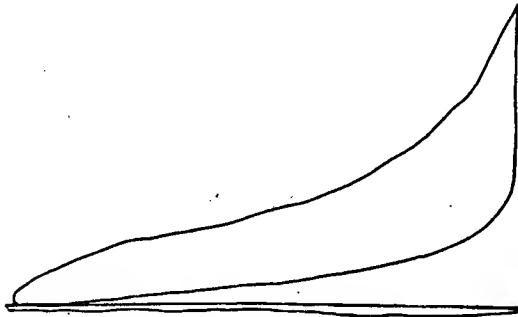


FIG. 1.—A normal manograph card under full load.

smaller amount of air and gasoline taken in; the heat may be so high that the lubricating oil will fail to perform its proper functions, causing an increase of friction which still further heats the cylinder and reduces its power.

3. This has been proved by introducing such a lubricant as graphite, which is not influenced by heat, onto the cylinder walls after the power has dropped, and noting the almost instantaneous recovery of the power. The piston head may become expanded so much that it will seize. The incoming charge may become so heated by the walls and by compression that it is ignited prematurely.

4. This generally occurs at a low engine speed and is indicated by energetic knocking. Indicator cards taken by the monograph under these conditions show the pressure to have risen very much higher than normal, indicating that a true explosion may have taken place.

5. Fig. 1 represents an ordinary monograph card, and Fig. 2 shows the high initial pressure due to premature ignition from heat.

6. Again, some projection in the cylinder of metal or accumulated carbon, or more often a red-hot exhaust valve, may cause a premature explosion at high speed, or even a burning of the charge on entering the cylinder. This may also produce the same effect at low speed as is shown on Fig. 2. It is therefore necessary to apply such remedies as may obviate as much as possible the above conditions.

7. In order to keep the temperature of the cylinder walls within working limits, it is evident that the design must be such that either less heat must be allowed to enter the walls or more must be carried off, or both of these results must be accomplished.

8. Getting less heat into the walls involves one of the fundamental principles of the economy of the gas engine, and is best accomplished by reducing the internal surface exposed to combustion to a minimum which means principally to design the combustion chamber as nearly spherical as possible.

9. If the internal surface is less, the less the incoming charge is heated and the less heat is lost to the cylinder walls; therefore the greater the power and efficiency; the less heat it is necessary to carry off from the walls to keep them at a working temperature.

*Paper presented at the Indianapolis, Ind., meeting of the American Society of Mechanical Engineers.

This fact does not yet seem to be well recognized, and we still see engines built with a valve pocket on each side of the cylinder.

10. The internal surface exposed to heat at the time of explosion in a 4" x 4" motor with a semi-spherical cylinder head is about 38 square inches; in the same motor with a valve pocket on either side of the cylinder about 74 square inches, and a good part of this surface has to be left rough. It is self-evident that the jacket loss must be much greater in the last instance.

11. Engines with a semi-spherical head will show a gain of 25 per cent. in power and efficiency over the prevalent type with a valve pocket on each side. This type of cylinder head may also be machined smooth on the inside to reduce its absorbent effect to a minimum.

THE EXHAUST GASES.

12. In passing out of the cylinder these gases raise the temperature of the exhaust valve often to the point of premature ignition, and give up their heat to the metal adjacent to the valve and to the valve passages.

13. If a port is made at the bottom of the stroke, a large part of the exhaust will pass out here before the main exhaust opens, and the pressure will drop to atmosphere by the end of the stroke. Therefore, the temperature of the gases passing out at the exhaust valve will be greatly reduced.

14. The exhaust passages contiguous to the cylinder should also be made as short as possible.

15. Fig. 1 shows a manograph card taken from a 4" x 4 1-4" engine with an exhaust opening 40 degrees before the end of the stroke. Fig. 3 shows a card of a 4" x 4" engine, with auxiliary exhaust opening at the same point.

The best internal conditions may be summed up as follows:

- a To present the minimum internal surface to the heat.
- b To make this surface as smooth as possible.
- c To carry off the hot exhaust gases at the bottom of the stroke before the main exhaust valve opens.
- d To get rid of what is left with as little surface contact with the cylinder as possible.
- e To reduce the friction of piston on the cylinder to a minimum.
- f To keep all projections out of the cylinder.
- g To make the compression just right to fit all other conditions.

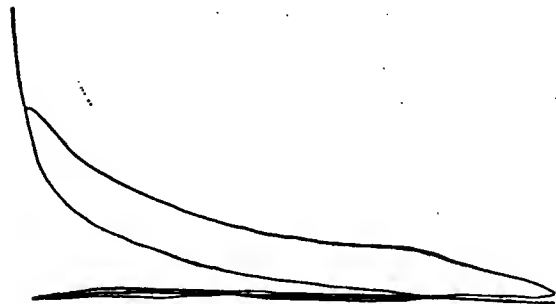


FIG. 2.—Premature ignition manograph card due to overheating of engine.

16. The above represents the science of air-cooling in regard to the internal conditions of the cylinder as far as the writer understands it.

17. There still remain the external conditions which, outside of the fact that the more circulation of air the better, have not yielded results that can so confidently be asserted as correct.

18. What the form, position, and material of the outside surface shall be has not been reduced to a positive science.

19. If we try to make the cooling surface part of the cylinder

casting, we meet great difficulties in the way of unsound casting, insufficient area, and too much weight. If we attach pieces of copper or other good conduction metal in the form of rings or studs, it is very necessary to take great care to make an extremely good mechanical joint. No one has yet succeeded in brazing or soldering such material to the cylinder in satisfactory form. An ideal cooling medium would be a finely and equally spaced growth of copper hair metallicity joined to the cylinder.

20. A still further complication of cooling is presented by the necessity of using a four-cylinder motor placed longitudinally in the car.

21. If it is attempted to cool this design by the general circulation of a fan in front, each cylinder tends to keep the air away from the next and to radiate its heat to its neighbor, and the cooling medium gets warmer as it gets toward the rear, decreasing its cooling power. It is therefore necessary to increase the cooling surface toward the rear of the engine; cylinder No. 3 requiring the most attention, and No. 2 requiring somewhat less, and No. 1 requiring very little surface, showing the efficiency of a rapid circulation on an unobstructed cylinder.

22. If we use a blower and drive the air separately over each cylinder, a large amount of power is absorbed by the blower, and a piping system of considerable complication is needed. It also has one of the weaknesses of the water-cooled motor, namely,

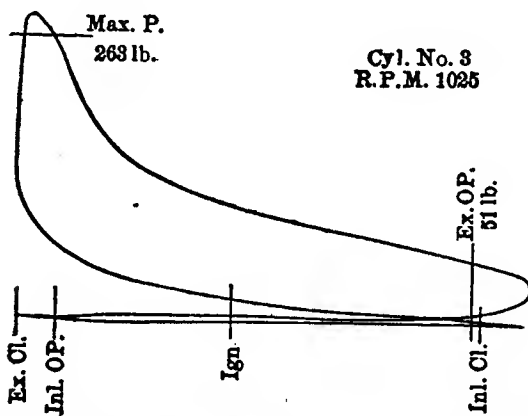


FIG. 3.—Manograph card showing effect of auxiliary exhaust openings.

the danger of ruining the motor by the breakdown of the circulating mechanism.

23. In regard to the size of the air-cooled motor that could be used in an automobile, an investigation of the relative sizes of the internal surfaces, volumes, and speeds of two similar engines seems to show that the larger the engine the lower the temperature of the cylinder walls. The only parts of a large engine that get hotter than a small one are the exhaust valve and center of piston.

24. If an auxiliary exhaust port is used, the exhaust valve gets no hotter than in a smaller engine, and therefore the limiting feature of air-cooling a large engine is the temperature of the piston center. I have used 4-cylinder engines as large as 5" x 5" with as much success as smaller ones.

25. In view of the above, it might be asked what can actually be said of the performance of air-cooled motors in practice. A 4-cylinder 4" x 4" motor with a clearance space of 26 per cent. of total volume delivering at the brake:

21 horsepower at 1,000 revolutions and

27 horsepower at 1,500 revolutions

or 1 horsepower for each 7.4 cubic inches of displacement at 1,000 feet per minimum piston speed will positively meet every condition of road use, and we hope to see in the near future 30 horsepower at 1,000 feet piston speed or 1 horsepower for each 6 2-3" piston displacement. This, so far as the writer knows, is as good as is commercially produced in a water-cooled engine of the same size and of the most efficient type.

26. As to the heat efficiency of a motor of this size, tests show it to be as high as 20 per cent., which represents 0.7 pounds of gasoline per brake horsepower hour.

27. In so much as the air-cooled motor we are talking about is meant to use only on a road vehicle, it must stand or fall on its merits as such. It would not be reasonable to assert that an engine can be kept as cool with air as with water, and it is not desirable to do so anyway, as the efficiency will be higher with the hot motor.

28. The air-cooled motor is correct in theory in that it directly cools by the air, and the ordinary type is simpler, lighter, cheaper and proof against extreme cold and extreme heat. In respect to its cooling it is not dependent for its safety on any working mechanism. Even with the loss of its fan it can generally be brought to its destination on schedule time. Such faults as it has had have been slowly eliminated. Whether it has any inherent defects which can never be corrected is very doubtful, and its entrance into even the high-powered field is only a question of time.

SOME FACTS CONCERNING ALUMINUM.

The great rise in the price of copper during the past year and a half, and the fact that the demand has exceeded the supplies of this metal, lends additional interest at the present moment to the position in the aluminum industry, says *The Engineer*. For aluminum is the one metal which may take the place of copper in many of the arts and industries, and the recent enormous increase in the demand for aluminum is probably connected with the high prices ruling in the copper market. It is noteworthy that this metal, which down to the year 1889 was produced only by chemical method, and was looked upon more or less as a curiosity, is now manufactured at the rate of 12,000 tons per year in works controlling over 96,000 horsepower, and that the output is rapidly increasing. Since the relative specific gravities of aluminum and copper are in round numbers in the ratio of 1:3, it follows that the annual output of aluminum at present is equivalent in volume to 36,000 tons of copper. Two of the larger companies producing the light metal are, however, arranging to double, or even treble, their water-power and reduction plants at an early date, and the production of aluminum in the year 1909 may quite possibly rise to 24,000 tons per annum, or to the equivalent in volume of 72,000 tons of copper. The possibility of aluminum or its alloys supplanting copper in many of its applications is, therefore, not so remote as many engineers might suppose, and the fact that in the form of oxide it is one of the commonest constituents of the earth's crust would seem to indicate that it will occupy a position of increasing importance in the metallurgy of the future. The most important factor in this increase will be a reduction in price due to cheapened methods of production. At the present time the ingot metal is selling for \$1,000 per ton, or at the rate of 43 cents per pound, and is the equivalent in volume of copper at \$335 per ton. Owing to the greater difficulty of working aluminum, and the necessity for using it for many purposes in the form of alloys, the practical difference in cost of the metals is less, however, than is indicated by these figures. There is good reason to suppose that aluminum can be produced, even now, at a cost of 24 cents per pound, or \$560 per ton. Should a simpler method of preparing the aluminum oxide for the electrolytic bath be discovered, this first cost may be reduced to 16 to 18 cents per pound, equivalent to \$375 or \$420 per ton.

WHERE ASBESTOS IS MINED.

Asbestos is mined in open pits similar to stone quarries, and, although it is found in all parts of the world, the mines in Quebec are the most famous, yielding about 85 per cent. of the world's supply of chrysotile. In 1879 the output of the Quebec mines was 300 tons, which has steadily increased year by year to 50,000 tons in 1905.

SOME FEATURES OF AUTOMOBILE CONSTRUCTION*

By THOS. J. FAY, E.E.

THE range of speeds on the 30-inch lathe was fixed the same as the speeds would be fixed for smaller lathes, for small work, and, in fact, the 20-inch lathes ran at the same speed as the 30-inch tools.

It was found that tool steel of almost every make would not stand up, but it was also found that the finer grades of nature-hard tool steel, as "Novo," "Bischoff" and "Krupp Quick Cutting"—air hardened—tool steel held up in a manner most becoming. In the experiment in question, Novo drills and cutters were found to pay for themselves; although, if prayers would reduce the price, one would be tempted to say, "Let us pray."

The color of the turnings from chrome nickel steel off the larger sizes of tools are always "blue"—a sample of which is available here for inspection,—and the best way, perhaps, to pay labor is by the color of the turnings; although a machinist on a 16-inch lathe, if paid by color, *would starve to death.*

In designing it would seem as if "lathe work" is by far the easiest of accomplishment, and "milling" is superior to "shaping." There are many pieces in a car that, if carefully looked over, can be more nearly finished on a lathe, and, as a rule, lathe accuracy is satisfactory, especially if "finishing" is done on a grinder subsequently.

As regards the question of the need for the finer grades of steel in motor car practice, everything depends upon the car and the service. A high-powered heavy car certainly will be superior, if perchance certain of its most important parts are alloy steel, and, too, it is believed, the extravagant use of fine steel is a *better* mistake to make, than to inflict a Bessemer steel crankshaft, for illustration, on an unsuspecting purchaser.

Springs have been a great source of annoyance to most every builder of cars, and it is now quite plain to be seen that the carbon steel railway springs of ancient vintage will not suffice, excepting for low-powered light runabouts.

A good and much-used railway spring formula is as follows:

SPRING STEEL

Carbon.....	0.80+
Silicon.....	0.12-
Sulphur.....	0.035-
Phosphorus.....	0.80-
Manganese.....	0.80-
Arsenic.....	0.12-
Copper.....	Trace

This grade of material is medium good, and serves for springs in places indicating the use of carbon steel. The average motor car indicates the use of alloy steel for springs, and a recent American alloy steel spring product promises to serve the purpose extremely well, the analyses of which, as now known, being as follows:

	I	II	III
Chromium.....	0.99	1.31	1.25
Nickel.....	1.17	1.65	2.00
Tungsten.....	1.02	1.31	1.00
Carbon.....	0.20	0.25	0.35
Silicon.....	0.037	0.056	0.23
Sulphur.....	0.017	0.011	0.041
Phosphorus.....	0.018	0.013	0.023
Manganese.....	0.23	0.12	0.17

These analyses show every indication of fine steel, and the reports thus far are of a far better tone than any of the carbon steel performances. The physical properties of this steel are about as follows:

T. S.	E. L.	Ex.-2"	Con.
155,000	150,200	16	47

which, for normal steel, is a very satisfactory condition.

Side frames are, as yet, a more or less unsatisfactory quantity,

* Paper read before the Society of Automobile Engineers. Continued from page 888, issue of May 30.

mostly because there is no standard, and changes are at once noticeable. Foreign cars, of the latest vintage, show very heavy side frames, with very wide flanges, largely for effect. Some of the best of the foreign side frames are of what is known as C 46-0 Krupp steel, the physical properties of which are given by "Krupp" as follows:

T. S.	E. L.	Ex.-2"	Con.
114,600	93,300	17	55

There is one excellent "French" product, but little used, however, as follows:

CHEMICAL COMPOSITION

Nickel	Carbon	Silicon	Sulphur	Phosphorus	Manganese
4½	.85	0.13	0.014	0.013	0.35

PHYSICAL PROPERTIES

T. S.	E. L.	Ex.-3.9"	Con.
121,000	108,000	14	42

In some American cars, as the B. L. M., and possibly others, as well as such of the cars as the speaker is now engaged upon for Mr. Ellsworth, the chassis frame stock is made of E. F. 60.0 Krupp chrome nickel steel, the normal properties of which are as follows:

CHEMICAL COMPOSITION

Chromium	Nickel	Carbon	Silicon	Sulphur	Phosphorus	Manganese
1.50	3.50	.25	.20	.025	.012	.40

The normal physical properties are as follows:

PHYSICAL PROPERTIES

T. S.	E. L.	Ex.-2"	Con.
110,000	95,000	20	44

It will be understood that rolled into sheets, this product increases in tensile strength and elastic limit enormously. As regards the hot and cold bending test, enough is to say, it will barely stand 180° and hammering down flat; in fact, some proof falls short of this exacting test.

One more product for side frames that has been used with good success is that known as Firebox Steel, as follows:

CHEMICAL COMPOSITION

Carbon	Silicon	Sulphur	Phosphorus	Manganese
.15	.10	.40	.04	.30 to .50

Carbon subject to change to give physical properties:

T. S.	E. L.	Ex.	Bend Test
52,000	32,000+	26+	180° and hammer down flat, without any sign of cracking, both hot, red and cold
to			
62,000			

In any case, chassis frames are entitled to far more consideration than they have been accorded, in some cases at any rate, and it is not believed that good steel will be likely to put the cost so high as not to be tolerated.

The question of ball bearings will no doubt be handled admirably by Mr. Hess, and the speaker desires only to bring out one point that may be of general interest aside from ball bearings. It is generally conceded that the quality of the material used in certain ball bearing races is something out of the ordinary, and while it has changed from time to time, yet even so it can be set down as a chrome-wolfram steel, and not a chrome nickel steel product. The most recent information on the subject of this remarkable grade of steel was received by the speaker from his assistant, Mr. Jos. Schaeffers—now in Germany—giving the main chemical contents as follows:

Chromium.....	1.5%	} Carbon probably between 0.20 and 0.30 per cent.
Wolfram.....	1.0%	
Copper.....	0.01%	
Nickel.....	None	

As to the presence of copper, it is by design; as to its real advantage, it is difficult to say. The normal physical properties of this steel may be put down as follows:

T. S.	E. L.	Ex.
160,000	156,500	16

While this product, when heat-treated, could reach to marvelous heights, as for illustration, "double the normal tensile strength," that this steel would serve admirably for certain other work, as piston pins, gears, and such other parts as are subject to high pressure and shock loads, should be a reasonable expectation. Unfortunately, however, it has been exceedingly difficult to procure this product, manufactured as it was for an exclusive trade, or better yet, in spite of an excluded would-be trade.

"If you want to get acid open hearth steel low in sulphur and phosphorus, it must be at the expense of good raw material, and I claim that the misfortune of the mill in that connection is our fortune, because if we specify acid open hearth steel, and limit the phosphorus and sulphur to a low point, we will have procured steel from good raw material. That is assuming we get what we ordered."

Aluminum for motor cases, gear boxes and like parts is scarcely better than it ever was, and it never was strong; in fact, a reasonable expectation from the strength point of view is a maximum at 16,000 pounds per square inch, and 9,000 pounds per square inch will be in imminent danger. The elastic limit of cast aluminum is not as a rule a reasonable quantity and the elongation is nominal.

In the *Horseless Age* of January 9, 1907, E. F. Lake reported the strength of aluminum castings as follows:

TEST NO. 1			
T. S.	E. L.	Ex.-4"	Con.
21,000	8,400	8.25%	9.5%
TEST NO. 2			
T. S.	E. L.	Ex.-4"	Con.
30,200	17,600	2.75%	5%

These values are utterly impossible of attainment in castings in a commercial way, if at all, nor do they accord in principle with the characteristics of aluminum castings; in fact, it is such tests that gave to aluminum a bad reputation, whereas, if designers will take into account its low strength, they can reduce weight by its use, but they can also court serious trouble by taking inflated values into account. The true strength of aluminum castings is reflected in the tests as follows:

"A"—CHEMICAL COMPOSITION			
Aluminum	Copper	Manganese	Iron
91.24	5.44	2.48	0.40
PHYSICAL PROPERTIES			
T. S.	E. L.	Ex.-8"	Con.
9,390	9,390	0.16	

Test proof 1 inch square. Test by Robt. W. Hunt & Co. for the writer:

"B"—CHEMICAL COMPOSITION			
Aluminum	Copper	Zinc	Iron
95.4	2.11	1.36	Trace
PHYSICAL PROPERTIES			
T. S.	E. L.	Ex.-8"	Con.
9,176	9,176	0.13	

Test proof 1 inch square. Test by Robt. W. Hunt & Co. for the writer. Motor case of this product broke in service.

Of all product testing higher, the foundry failed to make good castings, and it is doubtful if the foundry can. At the present time the foundry furnishing castings of aluminum for such work as the writer directs does so with the understanding that the tensile strength shall not be more than 16,000 pounds per square inch, and it is doubtful if this value is reached.

Manganese bronze is, of course, superior for such work, but it weighs more. The strength of this product is within the limits as follows:

MANGANESE BRONZE—PHYSICAL PROPERTIES			
T. S.	E. L.	Ex.-2"	Con.
65,000	30,000	20	25
75,000	35,000	25	30

The relation of weights is given by Lake as follows:

SPECIFIC GRAVITY	
Cast aluminum.....	2.85
Cast iron.....	7.218
Steel castings.....	7.919
Cast brass.....	8.320
Cast bronze.....	8.832

These figures will serve as a guide in estimating the advantages of aluminum from the weight point of view, but:

$$\frac{8.832}{2.85} = 3.098 \text{ ratio of weight in favor of aluminum;}$$

on the other hand, the ratio of strength would be approximately

$$\frac{70,000}{10,000} = 7 \text{ to } 1 \text{ in favor of bronze,}$$

and the ratio of cost would be:

$$\frac{65}{32.5} = 2 \text{ to } 1 \text{ in favor of bronze.}$$

Result: Three hundred and nine pounds of bronze would do the work of 700 pounds of aluminum, with equal liability to rupture, making the section in the ratio of one to seven, and the cost \$100.42 for bronze and \$445 for aluminum, although it is fair to say it is rarely possible to make the section of bronze so much thinner than aluminum, nor would one care to do so, since greater strength than aluminum affords is much to be desired. Nevertheless, 'tis well to know the lay of the land.

WHY STEEL CHANGES CHARACTER IN HEATING.

(1) When a piece of steel is heated in connection with a pyrometer, its temperature is seen gradually to rise until 720 degrees C. is reached, when the instrument remains stationary for a short time—showing an abnormal absorption of heat by the specimen; the pyrometer needle then resumes its journey, says *The English Mechanic*. If the piece now be allowed to cool, a point is reached at 680 degrees C. where the pyrometer again arrests, indicating an abnormal evolution of heat; this is called the recalcence, and the temperature of the steel often rises to such a degree that it can be seen to glow. (2) When carbon is added to iron, either by cementation (as in case-hardening) or by melting together in a crucible, a definite carbide of iron is formed (Fe₃C). If a piece of carbon steel be heated to 720 degrees C., the carbide which it contains dissolves in the mass, and forms a solid solution of carbide of iron in iron, accompanied by an absorption of heat. On cooling suddenly this solid solution is retained in the cold, and the steel is hard. But suppose after passing through the arrest point on heating that the steel be allowed to cool gradually, then at 680 degrees C. the carbide of iron crystallizes out with evolution of heat. Under the microscope the cold steel now is seen to consist of separate particles of carbide of iron and iron *per se*. In this condition the steel is soft. So that the degree of hardness obtained after heating to above 720 degrees C. depends upon (a) amount of carbon contained by the steel, (b) rapidity of cooling. Notwithstanding all the published nostrums, there is no virtue in the chilling liquid beyond the degree of rapidity with which it can absorb the heat from the steel. Tempering simply consists in heating hardened steel until the desired amount of carbide has fallen out of solution. The effect is similar to a mild quenching. Tempering colors are simply surface oxidation effects, used as rough temperature indicators, the colors varying with the depth of oxidation, and consequently with the amount of heat remaining in the steel. Annealing consists in heating the steel to a point below 720 degrees C. and slowly cooling, so that all the carbide may fall out of solution. The above must only be taken as a rough outline of the theory; there are often complicating factors.

EFFECT OF SIZE ON THE THERMAL EFFICIENCY*

By H. L. CALLENDAR, F. R. S.

THE thermal efficiency of an internal combustion motor, defined as the ratio of the work done to the equivalent of the heat of combustion, is limited chiefly by two sources of loss. (1) Part of the heat is necessarily lost during ignition and expansion to the cooler walls of the cylinder. (2) The heat remaining in the exhaust gases at the end of expansion is rejected unused. Losses of the first kind depend on the temperature of combustion, on the surface exposed, and other conditions, and are in part avoidable. Losses of the second kind depend chiefly on the properties of the working fluid and on the limitations of expansion, and are in a sense unavoidable. The loss of efficiency from this cause may be calculated for any given conditions in a manner which is well understood. Losses of the first kind cannot be directly calculated in any simple manner, but may be deduced by comparing the performances of actual engines with those of ideal engines in which losses of the second kind are calculated and allowed for. In discussing losses of the first kind, which form the main subject of the present paper, it is therefore necessary first to consider briefly the case of an ideal engine in which there is no loss of heat to the walls of the cylinder, but only the necessary loss due to incomplete expansion.

Air Standard Efficiency.

For an internal combustion engine in which the ratio of expansion is equal to that of compression, assuming the working fluid to possess the properties of a perfect gas of constant specific heat, and supposing that there is no loss of heat to the walls of the cylinder, the fraction of the heat of combustion rejected unused at the end of expansion is given by the ratio T''/T' of the absolute temperature T'' at the end of expansion to the maximum temperature T' . The thermal efficiency, or the fraction of the heat converted into work, is $1 - T''/T'$. If the ratio of expansion or compression is denoted by r , and the ratio of the specific heats of the gas by γ , the ratio of the temperatures T'/T'' will be $r^{\gamma-1}$, and the expression for the variation of the ideal efficiency in terms of the ratio of expansion becomes,

$$\text{Ideal efficiency} = 1 - (1/r)^{\gamma-1} \quad (1)$$

If the working fluid is a mixture of diatomic gases such as air, for which the ideal value of the ratio of specific heats is $\gamma = 1.40$, the value of the index $\gamma - 1$ is .40, and the formula becomes,

$$\text{Air-standard efficiency} = 1 - (1/r)^{.40} = E \quad (2)$$

If the working fluid is a perfect gas of constant specific heats, but with a different value of the ratio γ , the ideal efficiency will be different from that of the air-standard for the same ratio of expansion. The "Relative Efficiency," or the efficiency relative to the air-standard for the same ratio of expansion, is found by taking the ratio of the efficiency to that of the air-standard.

Relative Efficiency of Actual Engine.

The working fluid in the actual engine is not a perfect gas. It approximates to a perfect gas in that the product of its pressure and volume, pV , is nearly proportional to the absolute temperature T , but the specific heat is not constant, and is not the same before and after ignition. The ratio of the specific heats is different during compression and expansion, and there is a change of molecular volume in the process of combustion. Formula (1) for the efficiency does not therefore apply accurately. Nevertheless, it has been shown by experiment that the variation of efficiency with compression-ratio follows very closely that of the air-standard, or that the relative efficiency of a given engine is nearly independent of the compression-ratio under similar conditions of running. The actual efficiency is found to be about 60 per cent. of the air-standard for an engine of moderate size under good condi-

tions. Part of this defect of 40 per cent. is unavoidable, being due to the fact that the ratio of the specific heats of the products of combustion at working temperatures is much less than that of air; the remainder is chiefly due to loss of heat during ignition and expansion, which depends on the size of the engine and other conditions.

Properties of the Working Fluid.

In order to estimate the unavoidable loss of relative efficiency, it is necessary to consider the properties of the working fluid. The rise of temperature and pressure observed in the rapid combustion of an explosive mixture is only 50 or 60 per cent. of that calculated on the assumption that the whole heat of combustion is developed, and that the specific heats of the gases have the values observed at ordinary temperatures. The defect has been explained by supposing either (1) that the combination is not complete, and that some dissociation persists at high temperatures, or (2) that the specific heats of the products of combustion increase considerably with temperature. The two interpretations are often regarded as diametrically opposed, but it is probable that they are merely different ways of expressing the same thing. It is most likely that all change of specific heat is really due to internal work of molecular re-arrangement, which is a necessary accompaniment of dissociation; and conversely, that no dissociation can occur without an apparent change of specific heat. It is highly probable that some of the products of combustion remain dissociated, or that unstable endothermic compounds are formed in complicated mixtures at high temperatures. But the resultant effect can be consistently represented for the present purpose as an apparent change in the specific heat. Values of the apparent specific heats of various gases have been obtained by Mallard and Le Chatelier and other observers, by observing explosion-pressures in closed vessels. More recently the apparent specific heats of the actual products of combustion in the cylinder of a gas-engine under working conditions have been deduced by Dugald Clerk by a most ingenious dynamical method (Proc. R. S., Vol. 77, 1906) which gives the specific heat directly in terms of work done by the piston in compressing the gas. The conclusion from these experiments was that the apparent specific heat of the products of combustion reached a nearly constant limiting value at a temperature somewhat above 1,000° C., and that the ratio of the specific heats was nearly constant, and equal to 1.29, for the greater part of the expansion curve at ordinary working temperatures. From the values of the apparent specific heat so obtained, Clerk was able to deduce the ideal limit of efficiency of the gas-engine assuming no loss of heat to the walls of the cylinder.

It must also be remembered that, as Burstall and Hopkinson have shown, there are very large differences of temperature existing in different parts of the cylinder of a large gas-engine immediately after combustion is complete. The data for the specific heats at the higher parts of the range, approaching 1,600° C., are therefore more uncertain and difficult to obtain, and may be affected by constant errors. If the specific heat does not reach a limit, but continues to increase at higher temperatures—as other experiments appear to indicate, and the phenomena of dissociation would lead us to expect—the limiting value of the relative efficiency (assuming no heat loss to the walls) would be less than 0.80. We may conclude on this ground that at least 20 per cent. of the defect of the actual efficiency from the air-standard is to be explained by the properties of the working fluid, and is therefore unavoidable.

Variation of Efficiency with Size.

It is generally admitted that, other things being equal, a small engine is less efficient than a large one. Both the thermal and the mechanical losses are greater in proportion in the smaller engine,

*Extract from paper read before The Institute of Automobile Engineers, London.

but of the two the thermal losses are usually the most important. The most obvious method of investigating these losses in relation to size is to make a number of experiments on similar engines of different sizes under similar conditions, and to obtain an empirical formula to represent the results as a function of size.

It is a very difficult matter to obtain a series of exactly similar engines of widely different sizes, and to ensure that the trials are made under precisely similar conditions. A less direct method which should be employed in conjunction with the first, is to study the variation of the losses under widely different conditions in a single engine, so as to investigate the effect of different conditions of running, and to deduce, if possible, the laws of variation of the losses in question.

Experiments with a Small Motor.

In order to study this question from a theoretical point of view, I undertook a series of experiments about three years ago with a very small motor, 2.36 inches bore. The motor was fitted with an indicator capable of working with a high degree of accuracy up to a speed of 2,500 revolutions per minute. A number of thermocouples were inserted in the walls of the cylinder for observing the temperatures and estimating the losses in different parts of the cylinder. Fans were arranged for regulating the temperature, and electric and mechanical brakes for measuring the load. There were several advantages in employing a motor of this type. Owing to its small size, the losses to be investigated were greatly exaggerated, and were therefore rendered easier of detection and measurement. The conditions could be very easily and quickly varied through a very wide range as regards speed, load, etc. There was no water jacket to equalize artificially the temperatures of different parts of the cylinder, or to interfere with free access to anything. Many reliable experiments were available for comparison on other types of motors, but the small petrol motor afforded a comparatively new field. I can only give general results so far as they affect the point at issue.

Variation of Heat Loss with Speed and Temperature.

It is very commonly assumed in considering loss of heat from a gas to a surface that the rate of loss is proportional to the temperature-difference and to the surface exposed. This is true for static conditions and small differences of temperature, but is not even approximately correct in the problem under discussion. If it were true, the relative efficiency of an internal combustion engine would be independent of the size and the flame-temperature, and would increase indefinitely with the speed—results which are known to be incorrect. As a matter of fact, the conductivity of a gas increases very rapidly with temperature, which makes the heat-loss at high temperatures much greater than in simple proportion to the temperature-difference, and explains the loss of efficiency with increase of flame temperature. Part of the heat-loss is due to the fact that a layer of gas close to the surface cannot burn immediately. This would mean a nearly constant loss per explosion. Again, the transmission of heat from a gas to a surface is largely affected by the velocity of motion of the gas, which becomes the principal factor in determining the heat-loss in the cylinder of a gas-engine during combustion, where the motion is turbulent and the velocity high. Since the velocity of motion of the gases in a given engine, other things being equal, varies nearly as the speed in revolutions per minute, it is clear that, on this account, the heat-loss per explosion should be more nearly independent of the speed, and that there should not be any marked increase of mean pressure with increase of speed. There are doubtless many disturbing factors, too numerous to mention, which require careful consideration and adjustment, in order to arrive at the correct result. For very low speeds, the effects of leakage and static cooling tend to reduce the efficiency. For very high speeds ignition lag and gaseous inertia produce the same effect. It is essential to see that the engine gets the same quantity of the same mixture per stroke, and that the maximum pressure is developed at the same point. But if these and other

precautions are observed it will be found that the relative efficiency is nearly constant over as wide a range of speed as the design of the engine permits. In any case there will be a very flat maximum value of the efficiency at some particular speed which is not in general far removed from the normal speed of the engine.

Variation of Heat Loss with Size.

Assuming on the above grounds that the greater part of the heat-loss per explosion for a given diagram and flame-temperature is independent of the speed to a first approximation over a wide range, it should be simply proportional to the surface exposed and independent of the time of exposure. This part of loss expressed as a fraction of the heat of combustion should, therefore, vary as the ratio of surface to volume during and shortly after ignition. In other words, the loss of relative efficiency in similar engines of different size under equivalent conditions of running should vary inversely as the linear dimensions. The loss of efficiency may be taken to vary as A/D , where D is the diameter, and A an appropriate coefficient depending on the form of the surface, which remains constant so long as the form is the same. It is well known that any change in the form or extent of the surface of the combustion chamber produces a very marked effect on the efficiency.

The losses may vary from 20 to 40 per cent. They are far from negligible, and must evidently be taken into account in comparing motors of different sizes. Since the B.H.P. values are in all cases the most reliable and the most easily determined, and since the formula appears to represent them satisfactorily, we must assume that the variable part of the mechanical efficiency can be represented by the same type of formula as the variable part of the thermal losses. This effects a considerable simplification in applying the formula.

The considerations above discussed have an important bearing on the question of a rating formula. For general descriptive purposes it may be admitted that the rating formula adopted by the Royal Automobile Club, namely:

$$\text{Nominal B.H.P.} = 0.40 D^3 \text{ per cylinder, (A.C.)}$$

provides all, or nearly all, that is required. This formula is equivalent to assuming a normal piston speed of 1,000 feet per minute, and a mean effective pressure of 67.2 lbs. per square inch per explosion as corresponding to the B.H.P. There is no doubt that a series of geometrically similar motors, differing only in size, should be capable of running at the same piston-speed so far as the principal inertia stresses are concerned. But if such a formula is applied to the award of prizes in competitions, it may lead to undesirable departures from good design, since considerable advantage may be obtained by varying factors of which no account is taken in the formula. The principal factors unaccounted for in the A. C. rating are, (1) Variation of mean pressure with compression-ratio. (2) Variation of mean pressure with size. (3) Variation of piston-speed with ratio of stroke to bore. It is interesting to consider how far account may be taken of these factors, without unduly complicating the formula.

(To be concluded.)

FINISHING AUTOMOBILE CYLINDERS.

In spite of all claims of boring automobile cylinders complete at one setting on the machine, I do not believe it is good practice, says I. B. Rich, in *The American Machinist*. Whether they are to be finished by grinding or by a second passage of the boring tool, I believe the castings should be given time to relieve the initial strains as well as the changes set up by removing the inner skin of the casting. And I am naturally pleased to learn that some builders of automobiles are even going further than this. After being rough bored they are placed in an oven or furnace and held at approximately the heat at which they run when in use, for a number of hours. They are then given the finishing cut in the boring mill, and while this may be an unnecessary refinement, it certainly seems as if the cylinders should keep their shape better in actual service.

LETTERS INTERESTING AND INSTRUCTIVE

Advisability of Changing the Driving Ratio.

Editor THE AUTOMOBILE:

[770.]—I have a 1906 Maxwell speedster, 10 to 12-horsepower, with a maximum speed of 50 miles an hour. It is geared 3 1-2 to 1. If I change the gearing to 4 to 1, how much will it reduce the maximum speed? Also, how much will it reduce speed on low gear? How much increase in power would I get for low grades and muddy roads? I prefer power to speed, so would it pay to make the change? Please answer through "Letters Interesting and Instructive."
SUBSCRIBER.

Salt Lake City, Utah.

You do not state in your letter what size wheels your car is equipped with, but assuming that the latter are 30 inches in diameter, the cars speed on the direct drive would be reduced by more than 25 per cent., provided, of course, the motor speed was the same in both instances. With your present gear of 3 1-2 to 1 the motor must make 1,900 to 2,000 r. p. m. for the car to attain a speed of 50 miles an hour; figuring on the same basis, the motor speed would have to be increased to 2,600 r. p. m. or over, in order for the car to attain the 50-mile-an-hour rate with the lower gear. The reduction in speed on the low gear would naturally be proportionate to ratio the latter bears to direct drive.

Strictly speaking, there would be no increase in power, the output of the motor would remain the same regardless of the gearing, so long as it runs at its normal speed. But the capacity of the car to climb hills and negotiate bad roads would be increased in about the same proportion as the speed is increased; in other words, it would be possible to keep the motor running at about its normal speed under correspondingly more adverse road conditions. The question as to whether it will pay to make the change will depend upon the character of the country that the car is most used in. If the latter abounds in hills and bad roads, the fitting of a lower gear would be beneficial for the reasons already set forth, but if there is a great deal of running done on comparatively level roads, there would be an objectionable tendency for the motor to race. The 4 to 1 axle would give plenty of speed for all usual purposes, particularly in a hilly country.

Automobile Fire Engines and Street Cars.

Editor THE AUTOMOBILE:

[771.]—We are constantly reading, in the periodicals devoted to the automobile industry, of automobile fire engines and street cars in use in foreign cities. But we never hear anything of these modern inventions in this country. Is it really true, as I have often heard, that the United States is backward in the development and application of the automobile? If not, what is the explanation of European pre-eminence in these lines?
Ogden, Utah.

BRYAN CROSSWELL.

The United States is backward in most experimental work connected with the development of the automobile, though it is the foremost country in the world in the building and use of cars of established quality. Moreover, both the automobile fire engine and street car are in use in this country. Some of the first power-driven fire engines in the world were made in New England, as far back as in 1874 and 1875, and thus antedated practically all automobile invention in all countries. Numbers of motor-driven chemical engines are in use now in different cities of the country and are doing good service, while more are being installed all the time. The automobile street car—or, more properly, the motor omnibus—is running regularly for fares on several routes in New York City, while the so-called "sightseeing" vehicles, now a common spectacle in nearly all large cities, really amount to about the same thing and may be most fairly considered the precursors of more extensive public-service installations, which there is every indication will soon be displacing rail-carried street cars for everything but the longer hauls over hilly territory. It takes time, and the automobile is now reaching such a degree of perfection as will permit extensive commercial applications of it.

Regarding the Woodruff System of Keying.

Editor THE AUTOMOBILE:

[772.]—Under "Letters Interesting and Instructive" will you kindly inform me what is meant by the "Woodruff system of keying," and also describe the "Rites governor?"

The Woodruff system of keying, which is covered by patents, consists in the use of short keys in the shape of a section of a circle, *i. e.*, the underside of the key represents a portion of the arc of a circle, while the upper side is flat, there being a slight portion of the upper part of the key made square by carrying the sides down at right angles to the top a short distance to where they intersect the arc of the circle. The keyway is made to correspond, but instead of being cut longitudinally or parallel with the shaft, as is usually the case, it is cut transversely across the shaft, the number used depending upon the holding power required. This explains the principle in a general way, though it will be understood that more than one type of key is used, and the system as a whole is adaptable to the varying requirements of this class of work. The keyseats are made with specially formed milling cutters. If you wish to learn more regarding this matter, send your address and we will refer your inquiry to the manufacturers.

We do not know the "Rites" governor, nor have we been able to obtain any information regarding it, and will accordingly have to ask if any of our subscribers can enlighten the inquirer on this subject.

Sources of Ignition Current.

Editor THE AUTOMOBILE:

[773.]—Which is the best source of current for the ignition system of an automobile—dry batteries, storage batteries, magneto, or dynamo? What are the especial advantages and disadvantages of each of these, and why is there so much variety in the way different cars are equipped with them? I know that one automobile user will be in favor of one and another in favor of another, and, of course, the individual manufacturer or dealer will argue vigorously in favor of the system he supplies, but is it not possible to base an authoritative decision upon some set of definitely established, easily-obtainable facts? With the information I possess—and it is, I believe, equal to that possessed by the average automobile user—it is impossible to form a judgment that appeals as sound. Nevertheless, I think if you could give a little space in "Letters Interesting and Instructive" to this subject, it would be a help to a great many of your readers.

Covington, Ky.

DR. D. B. MARTIN.

The "best," in one sense, undoubtedly are the dynamo and the magneto—that is, they are the only sources of current which are absolutely self-contained, and require no renewal or recharging. They have, however, their objections, one of which is that their current output varies with the speed at which they are run, which, in turn, varies with the speed of the engine, unless complicated and often undesirable regulating drives are used. Another objection, which comes from the one just mentioned, is that the small current output at low speeds may make for a certain amount of difficulty at starting, especially with the dynamo, which is a worse offender than the magneto in this regard. This difficulty is what leads to the many systems in which the combination of a dry or a storage battery for starting and a magneto or dynamo for running is met with. Dry cells are very satisfactory and reliable, but lack long life, especially when subjected to hard usage in connection with multicylinder engines. They are, though, comparatively inexpensive and readily replaceable almost anywhere. The storage battery is reliable and is capable of delivering a large amount of current on a single charging, but it requires so long for recharging that in steady service a double equipment is practically necessary—one to charge while the other is in use. And the localities where direct current, suitable for recharging, is procurable, are considerably less numerous than they were before the present increasing vogue of alternating-cur-

rent equipments. The price factor counts for much. The low first cost of dry cells practically compels their use on low-priced cars, while the storage battery, dynamo and magneto, or some combination of these, seem to be preferred for the more pretentious conveyances.

Proper Compression Space for Two-Cycle Motor.

Editor THE AUTOMOBILE:

[774.]—I am figuring on making a four-cylinder, two-cycle, 3 1/4 by 4-inch gasoline engine, and am somewhat confused as to the proper size to make the combustion chamber. Will you kindly state through your "Letters Interesting and Instructive" column what size would be the most satisfactory?
C. U. I.
Kansas City, Mo.

The requirements of your question are rather ambiguous, as you fail to state what you wish the motor to be most satisfactory for, though from the dimensions given we presume it is intended for an automobile motor and it is further desired to obtain as much power from the completed engine as is consistent with good practice, considering its size and design. In cases where there is no clearance beyond that of the cylinder itself, the compression space may readily be determined by making it a certain proportion of the length of the stroke. As the two-cycle cylinder is perfectly straight and unencumbered by valve chambers or other disturbing factors, this method is applicable. It is customary to make the compression space equal to or less than one-third the volume displaced by the piston, so that in the case of the engine you contemplate building, taking four inches as the length of the stroke, the compression space could be made one inch or less, according to the degree of convexity of the cylinder head, as well as the counterbore, having considerable bearing on the matter. The compression to be used should be established first, as on this will depend the proper proportions of the piston pin, connecting rod and crankshaft.

What Materials Are Used in the Gearless Transmissions?

Editor THE AUTOMOBILE:

[775.]—I would like to ask a few questions concerning detailed features of the gearless transmission, a description of which recently appeared in "The Automobile." First, what metal is used in the construction of the friction plates, and, second, what are the latter faced with? An answer will greatly oblige a two-years reader of your paper.
H. V. B.

If you will again refer to the description of the features of construction of the gearless transmission which appeared in THE AUTOMOBILE, issue of May 9, page 788, you will note that this device does not embody any friction plates as such—that is, not in the sense that the term is generally understood with reference to the usual type of friction transmission employing two disks brought together at right angles. This is really a friction transmission of the planetary type employing mutually engaging internal cones and cages of rollers as the friction members, as will be seen from the illustrations of it that were reproduced.

We do not know just what particular metals are used in its construction, but presume that these differ in accordance with the service required of the different parts, the majority, however, doubtless being of a good quality of steel. Nor can we say what the friction rollers are faced with, but have no doubt your communication will fall under the eye of the designer of the transmission, and, unless the matter be a trade secret, further information will be forthcoming which will be published in a later issue.

A New Use for Chromium.

Editor THE AUTOMOBILE:

[776.]—As a repairman in an automobile shop, it struck me sometime ago that metallic chromium would be a very suitable material for the contact points of vibrators or tremblers. The extreme hardness of this metal, its infusibility, and its resistance to corrosion constitute insurance against the three chief troubles that beset the ordinary platinum points—wear, fusing, and tarnishing. I found it impossible by any method I knew to solder or braze the chromium points in place, and because of its hard and brittle nature, and almost complete lack of malleability, I had to file the points out of the solid material. What I wish to know is: Has chromium been previously used in this manner, and is

there any better way of working it than that of filing it out? Also, is there any method of soldering or brazing it? Once in place, it seems to give excellent results, though I have experienced some trouble with loosening of poorly secured points.

Waterbury, Conn.

HOMER VAN BRUNT.

The account of your experiments is very interesting, and in view of the high price of platinum, and the other well-known unsatisfactory features you mention, it may become a matter of considerable importance. There is no state of chromium, so far as we are able to ascertain, in which it is easy to work, no matter to what temperature it is subjected. We are even surprised that you were able to file it, and should think grinding necessary if the metal you have been using is pure. We also are unable to find any means of soldering it, and should be pleased to hear from any of our readers who can help out with suggestions. If your work has been anticipated, we are unable to recall it, though the writer has an impression that somewhere, a year or so ago, he read something along this line.

The Automobile Plow Again.

Editor THE AUTOMOBILE:

[777.]—Why is it that so little progress is made in the manufacture of motor plows and other motor-driven agricultural machinery, such as planters, sowers, harrows, cultivators, mowing machines, harvesters, etc.? It seems to me that there is a great field, and probably a considerable actual demand, awaiting the appearance of such machinery. No one who has ever had experience in it needs to be told how onerous most classes of farm labor are, and how much to be desired is the machine for displacing the horse, which, despite the length of his service, is in many ways inefficient and inadequate. It is my idea that something on the order of the motor forecarriage or tricar, capable of having attached to it different kinds of trawling apparatus, would be most available, since it could be then "hitched up" to whatever particular duty there might be at hand. Is such a device regarded as impractical, would it be prohibitively expensive, or what is the reason that there are no apparent signs of its coming?

Dallas, Texas.

CALVIN A. STARBUCK.

Probably a chief difficulty in the way of the particular progress you seem so earnestly to desire is the fact that the average tract of farm land is more or less hilly, and automobile vehicles of no class operate very well on hills where there are no roads. Some highly successful work has been done, nevertheless, in the direction of what you outline. For example, in England there is the Ivel agricultural motor, which plows, harrows and cultivates, and is in fairly extensive use. In this country, the International Harvester Company people, who now make a "buggy-type" automobile, are understood to have done considerable experimenting with an automobile reaping machine. This machine worked very well, but was never marketed because of a variety of reasons, chief of which were a rather high first cost and a lack of adaptability to rough ground. This was some years ago, and it is altogether probable that a marked commercial success might attend more up-to-date experiments, in which all of the recent progress of the art could be availed of. In Germany and in France, where more automobile pioneering has been done than in other countries, a good many motor vehicles are in use for agricultural purposes and are thoroughly successful. The probabilities are that the future will see much extension of their use and improvements in their qualities, while denatured alcohol very likely will be the fuel—thus giving an incidental but very positive impetus to agricultural enterprise generally. The traction engine, which has been a standard farm appliance for forty years, is a form of agricultural automobile, and in many parts of the west is used to tow gang plows, combined harvesters, and the like.

Wanted—a Forty-Passenger Electric "Rubbernecker"

Editor THE AUTOMOBILE:

[778.]—Will you kindly advise me where to buy a reliable electric 35 or 40-passenger sightseeing car for the least money?
New Orleans, La. TULANE AUTOMOBILE COMPANY, LTD.

This is something that falls outside the province of this department to answer directly, so we have accordingly communicated your inquiry for particulars to the leading makers of this type of vehicle, requesting them to send you the information.

EARLY JUNETIME HAPPENINGS OF THE CLUBS

First Rowe Trophy Contest to Be Held June 15-16.

BALTIMORE, MD., June 3.—The Automobile Club of Maryland, which, by deed of trust, becomes the custodian of the H. M. Rowe touring trophy, has accepted the conditions imposed by the donor, and will carry out the conditions of the gift, which prescribe that there shall be an annual contest of three runs annually, the first of not less than 150 miles, the second of not less than 250 miles, and the third of not less than 400 miles. The winner of the contest for each year shall be that car which has the least number of points scored against it for the three runs comprising the year's quota, but the trophy will remain in the custody of the Automobile Club of Maryland, and the name of the winner of each year's contests will be suitably engraved thereon. The contest for the Rowe trophy is open only to members of the Automobile Club of Maryland, and the first contest for the year 1907 has been set for June 15-16, to Hagerstown and return. The donor is Dr. H. M. Rowe, the club's president.

Details have been completed by the Automobile Club of Maryland for the third annual outing of orphans to be given June 12. One thousand orphans from the various institutions throughout the city will be taken in 200 cars that will be prettily decorated for the occasion. The outing will begin with a short parade through the city and Druid Hill Park, after which the party will go to Electric Park. Various amusements will be participated in by the children at the resort, after which supper will be served. In order to prevent any recklessness on the part of drivers a large detail of officers will go along on the trip.

Texans Plan a 1,000-mile Endurance Contest Across State.

FORT WORTH, TEX., June 1.—Among the features for advertising the State of Texas which the 5,000,000 Club of Texas is planning is a 1,000-mile endurance automobile contest across the State from El Paso to Texarkana, to be held next fall. The club was organized several months ago for the purpose of bringing immigration into Texas, so that the population of the State will reach the 5,000,000 mark by the time of the next government census. The club has the backing of the best business men, and is spending money in a variety of ways to accomplish its purpose, and has set aside \$5,000 for the purchase of suitable prizes for the auto contest.

The purpose of the race is to secure the advertising which it is considered will result from the fact that a 1,000-mile race can be run in one direction across a single State. The roads, where there are roads, are only fair, but most of the run will be in a country where the prairie can be used as well as any road. A meeting of the board of governors of the 5,000,000 Club will be held in Fort Worth, June 14 and 15, and it is probable that action on the race will be taken at that time. The route of the race will undoubtedly follow the Texas Pacific Railroad across the State, although there is a chance that the Southern Pacific will be followed from El Paso to Houston, and then the I. G. N. route northeast through the State be taken.

Geneva Automobile Club Holds Its Initial Run.

GENEVA, N. Y., June 3.—Thirty-one cars carrying approximately 100 passengers participated in the first run of the Geneva Automobile Club, held May 28. The trip was to Canandaigua, and was preceded by a short parade through the principal streets of the city. The trip was in the nature of an endurance run, the first prize for which was an automobile clock donated by the Geneva Automobile Company. F. C. Dilman and C. S. Burrall were tied for the prize, both of whom lacked two points of a perfect score under the rules. At Canandaigua a fish supper was indulged in and the return run was made in the evening.

Hartford A. C. Holds Its Orphan Day Run Early.

HARTFORD, CONN., June 3.—Owing to the fact that many members of the Automobile Club of Hartford depart for their summer homes prior to June 12, the date set for the national observance of Orphans' Day by the American Automobile Association, it was decided to celebrate the day on May 25. Fifty-two automobiles were tendered the committee in charge and about 200 children 95 of whom were from the Hartford Orphan Asylum, and the balance from the organized charities of the city, were given an outing. The run extended to Middletown and was in charge of President W. F. Fuller, Vice-president C. H. Gillette and Secretary Guy K. Dustin. On the return to Hartford, about 5 o'clock, lunch was served by Caterer Besse, the Pope Manufacturing Company, the Electric Vehicle Company, the Hartford Rubber Works, the Billings & Spencer Company, the Veeder Manufacturing Company, the Whitlock Coil Pipe Company, Brown, Thomson & Co., the Miner Garage Company and the Palace Automobile Station acting as hosts.

The Automobile Club of Hartford will give an outing yearly to the orphans the latter part of May each year.

Great Racing Enthusiasm at Guadalajara, Mexico.

GUADALAJARA, MEXICO, May 18.—Great enthusiasm is being manifested here over the successful two days' meet which was held May 12-13 under the auspices of the Jalisco Automobile Club, and there is promise that next year's events will rival some of the big races held in the United States. It is proposed to raise a fund of \$50,000 to improve the race course, and it is certain that there will be no lack of entries for the meeting. The Pope-Hartford people, whose car won the Jalisco cup at the recent meeting, is sure to be represented, and French, Italian, German, English, and American machines, all of which have representation in Mexico, will be entered to contest for its possession. Particular credit is due to Alfonzo Fernandez Somellera, vice-president of the Jalisco Club, who was the moving spirit in arranging the races, and is the donor of the Jalisco cup.

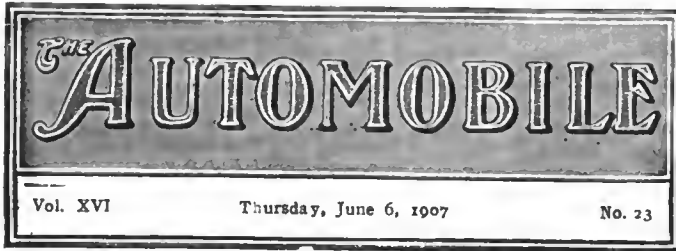
Harrisburg Club to Have July 4 Climb.

HARRISBURG, PA., June 3.—The Motor Club of Harrisburg is making elaborate arrangements for a hill-climbing contest which will be held on the Fourth of July. The climb will likely take place up Peter's Mountain, which is about ten miles from this city. The hill now being considered is over a mile in length and has several steep grades. Much interest is being shown in the contest and many entries are expected.

The Motor Club has set aside Saturday, June 15, for its annual Orphans' Day. On that day one hundred cars will be put at the disposal of the Exhibition and Runs Committee and the orphans of the six local charitable institutions will be taken a ride over the twenty-four miles of paved streets and out into the country over the city park system.

Detroiters Will Visit Grand Rapids Club.

DETROIT, MICH., June 3.—With winter weather still prevailing, making motoring anything but enjoyable, members of the Detroit Automobile Club are formulating plans for the summer's campaign, under the energetic direction of President Harry Skillman and his associates. The clubhouse at Pine Lake has been given a thorough renovation and was opened for the season on Sunday, May 18. The formal opening will be held some time later, and an all-day's pow-wow is being arranged, with numerous novel features in connection. Runs are also being planned to various points in the State, including a visit to the Grand Rapids Club. New members are being added rapidly.



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Permanent Conditions Existing in Making Autos. Nothing illustrates the settled condition of prosperous solidity to which the American automobile industry as a whole has attained than the set plan of campaign which the established manufacturer has adopted in outlining his year's work. The haphazard conditions that characterized earlier days where both the manufacturing and the selling ends were concerned have given way entirely, and in their place have come system and method which older industries were years in establishing. With the present month both the manufacturing and selling seasons for what are rather ambiguously termed 1907 models, draws to a close, so far as the manufacturer is concerned.

All the material ordered a year or more ago has been converted into the number of automobiles which their maker then undertook preparations to turn out. All but a small proportion of the cars thus built have been delivered to the dealers and have found their way into the hands of their new owners, and within the next thirty days or less the few remaining 1907 models will have traveled the same road, so that June may be said to mark the end of the automobile year, industrially speaking. Of course, not a few makers have anticipated the end of the season by several months, and their engineering departments have been busy with the forerunners of their 1908 product long before there was the slightest cessation of activity on the current models, both departments working concurrently and at full blast. But even those whose facilities have been taxed to the utmost in getting out their product in accordance with a well-defined schedule of deliveries outlined months ahead, will devote their energies to converting the plans for 1908 models that have been in the

draughting rooms since last winter, into finished machines. For the present, there is little change to be anticipated. Models that are new in more than name are promised in several instances, and developments along competitive lines are to be expected where the low-priced car is concerned, and particularly in the runabout class, but there will be little or nothing in the way of radical changes, other than what is already a matter of more or less common knowledge. The 1908 models will be in evidence in numbers within the next sixty to ninety days, but except in the case of the initiated few it will be a difficult matter to distinguish them from their immediate predecessors.



Automobiling's Extensive List of Events Tells a Story. Thousands attended the big list of events that took place on Decoration Day, and in the daily prints of the following morning more columns were devoted to telling the holiday story of automobiling than ever before in the comparatively brief history of the motor-driven vehicle. Endurance runs, hill climbs, and track races were held in various parts of the country, and the liberal space given for the news of the competitive form of the industry's pastime feature accentuated the widespread interest of the general public. For some time to come, according to our belief, it is a good investment for makers and agents to support in reasonable degree these events which serve to attract a considerable number of people to the wonderful improvement in the automobiles of to-day as compared to the attractive though somewhat uncertain cars of a couple of years ago. The time is near at hand when it will be a difficult matter to outline contests that will extend the automobile within many degrees of its capabilities. Even now there are perplexing ties involving many cars in numerous events, indicating general excellence, but the securing of a single cup winner is scarcely possible except where speed without reference to reliability is the deciding factor, and even then it is often by margins of fractions of seconds. Instead of the endurance of the car, the battle is resolving itself into a test of the physical strength and nerve of the driver, which might bring with it the unfair blaming of a car through the weakening of its pilot and not because of any flaw in its mechanism.



The Need for Educating the Public.

We have been so busy educating the man who has saddled himself with the responsibility of an automobile, or who has exhibited any intention of transforming a handful of banknotes into a glittering machine on four wheels, that we have totally ignored the poor mortal who does not possess, and has no hope of possessing, an auto in any form or shape. As a consequence, the man who has not got an automobile, and does not want one of the "darned things," has made special laws for us with as much wisdom as might be expected from a person knowing absolutely nothing of the subject. Buttonhole any man on the street who chatters glibly of legal limits of eight and ten miles an hour and ask him to indicate what such a rate of travel means. Not one man in a hundred can indicate with any degree of accuracy the speed at which a vehicle is moving, and the percentage is smaller of those who know the relative stopping powers of automobiles, horse vehicles and trolley cars. Yet it is the ninety-nine which make the laws. Because of this vagueness the campaign of a speedometer firm in showing the public at what rates of speed we travel is to be commended. Useful work might be done by trade associations in organizing stopping competitions in some public spot between various types of mechanical and horse-drawn vehicles. The results would astound the public. We should also insist on the incorporation in school curriculums of plain teaching on how to behave in crowded thoroughfares. The need for it is self-evident to any who observe the relation of the pedestrian to drivers in our cities. Rural inhabitants need to be told how to handle horses when brought into contact with automobiles. In some parts of Europe they are so educated by the schoolmaster and by clear, concise advice issued by trade associations.

CHANGES TO BE ASKED IN MARYLAND LAW.

BALTIMORE, Md., June 3.—Members of the Automobile Club of Maryland, together with other owners and dealers in this city and State, have decided upon a number of changes in the automobile laws of Maryland which they will request the next Legislature to make. One of the most important changes desired is the raising of the speed limit from twelve to twenty miles on open roads and to have the present rate of twelve miles an hour prevail on the stretch of those roads that are frequented by vehicles of every description. The autoists will also ask the Legislature to prohibit local or municipal authorities from passing local ordinances which conflict with the State law in regard to speed except in public parks and in the regulation of parades, etc. In some of these localities ordinances have been passed which make it unlawful for any sort of vehicle to go faster than six miles an hour.

The motorists favor a change in the law as it relates to non-residents. The present law says that before coming into this State non-residents must write ahead and get a license in Maryland. In writing for a license the prospective visiting motorist must give a description of his car, send \$3—the cost of the license—and send an affidavit to the effect that he knows how to run a machine. Automobilists of this State contend that many visitors stay away from Maryland because of these strict requirements, and that the State may be passed by entirely by the Glidden tour because it has been impossible thus far to make an arrangement to exempt the tourists from taking out Maryland licenses.

Efforts will also be made to provide dealers with a distinguishing number for a license registration, duplicates of the number to be used on all cars while in their possession. Upon the sale of any such motor vehicle the purchaser is required to take out a license in his own name. Under the present law a dealer is required to take out a new license for every new car he purchases before it can be used on the roads for demonstrating.

Purchasers of new cars will also ask to have assigned to them their former registration numbers. Autoists who are pioneers in this State naturally feel proud of that distinction, and if allowed to re-register new cars under the first number taken out by them that pride would be gratified. They would expect to pay for each new registration, their only request being to be allowed to keep the old number.

EXTENDING A PREVIOUS CUSTOMS RULING.

WASHINGTON, D. C., June 3.—The Secretary of the Treasury has informed the Collector of Customs at New York that the regulations of January 31, 1905, providing for the allowance of drawback on the exportation of automobiles manufactured by the Locomobile Company of America, of Bridgeport, Conn., with the use of imported rubber tires to which valves of domestic manufacture are fitted, have been extended, so far as applicable, to cover the exportation of automobiles manufactured by the Pope Manufacturing Company, of Hartford, Conn., with the use of imported tires, in accordance with their sworn statement, dated May 3, 1907, filed with the Collector in New York.

MORE RIGID ENFORCEMENT OF JERSEY LAW.

TRENTON, N. J., June 3.—Commissioner Smith of New Jersey has sent communications to the police departments of the State and the Boards of Freeholders of the different counties urging their co-operation in the enforcement of the automobile law, which recently has suffered many violations. Mr. Smith makes it clear that it is not within the power of his department to perform police duty, and therefore that part of the work must be done by the county authorities. Motorcycles are being spoken of very highly for this work and they have so many advantages in the way of low first cost, economy of maintenance and ease of handling that their adoption is very probable.

GLOBE-GIRDLER GLIDDEN TO BE ON A.A.A. TOUR.

BOSTON, June 3.—Charles J. Glidden, donor of the touring trophy bearing his name, and famous for his many tours in all parts of the world, is very well satisfied with the route as laid out by the A. A. A. touring committee. He has made arrangements for participating in the tour, and has accepted an invitation to accompany the tourists as a guest, though he will not drive a car. Mr. Glidden is somewhat disappointed that the Massachusetts automobilists are taking so little interest in the tour, but he hopes to see entries from clubs of this State.

Tentative plans for continuing his globe-girdling tour of 50,000 miles have been made by Mr. Glidden, and he will start for Europe as soon as the A. A. A. tour is completed. He still needs about 10,000 miles to complete the distance he set out to cover several years ago, and he plans to add several thousand miles this summer in Great Britain and the Continent by making three separate tours.

One of his first notable trips was to cross the Arctic Circle in Sweden several years ago. At that time he desired to travel in Norway, but the restrictions imposed by the authorities were so arduous that he gave up the plan. It was required that he should advertise his route at least six days in advance in the newspapers in the towns along the route he intended to travel, and it was also required that he should have a man on horseback constantly in front of the machine to warn the people of the coming of the automobile. Recently, however, these and the other restrictions which made Norway a practical impossibility for touring, have been removed, and Mr. Glidden has just received a letter from the authorities stating that the restrictions are no more, and inviting him to travel in that country. He has under consideration, therefore, a trip through Norway to the most northerly point, the town of Namsos, about 62 degrees, North latitude. In Sweden he reached 66.33 degrees.

Besides the Norway tour, Mr. Glidden has under consideration a tour from the most southerly point of England, Land's End, to the most northerly point of Scotland, John O'Groats'. The third tour which he is planning is through France to Madrid in Spain, and then across to Lisbon, Portugal.

\$9,000 FOR INVENTOR OF NEW FUEL.

PARIS, May 28.—France is searching for a new automobile fuel. The carburant to replace gasoline must be cheaper than the liquid we now use, must be adaptable to present machine without any serious changes and must give good results. It was the Chambre Syndicale de l'Automobile, a purely trade organization, which took up the idea, after noting that gasoline rates have a tendency to rise and that there was even a possibility of a famine before all of us are old men. Brought before the Automobile Club of France, the national body heartily approved of the scheme and immediately added \$2,000 to the \$1,000 offered by the syndicate. Private members of the A. C. F. announced their willingness to contribute to the prize list, so that at present there are \$9,000 in cash for the person producing a fuel equal to gasoline for working purposes, but lower in cost. The Club's Technical Commission has been charged to draw up rules governing the competition and will have charge of the tests.

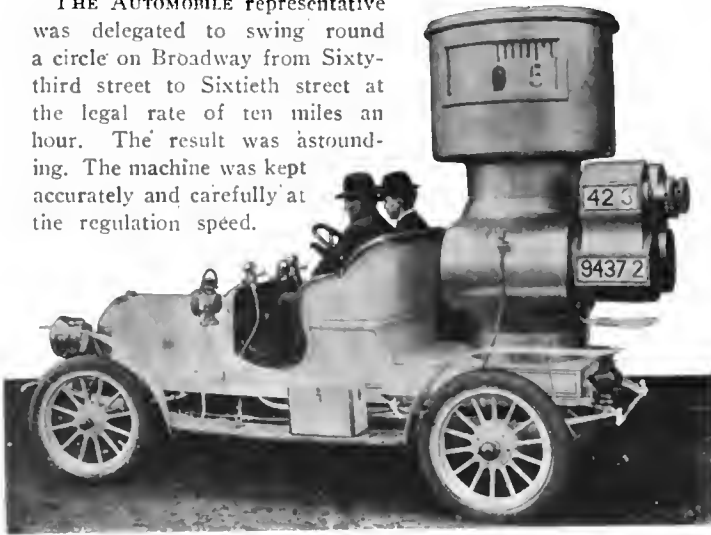
PRIZE WINNERS TO HAVE SHOW PRIVILEGES.

PARIS, May 28.—There will be special glory stands at the decennial Paris Salon for the victors in all the races, endurance tests and competitions organized during the year by the Automobile Club of France. Thus the machine winning the Grand Prix, the victor in the Criterium de France, and the first prize winners in the A. C. F. technical competitions may occupy a select position in the elegant Grand Palais without paying rent. Nearly one hundred entries have already been received for the show, which opens its doors on November 12, more gorgeous and more extensive than ever.

TO PROVE ABSURDITY OF SPEED LAWS.

If the speed laws of New York City were rigorously enforced the entire vehicular traffic would be brought to a standstill. To prove the absurdity of the present rule limiting the speed of automobiles in the city to ten miles an hour, the Warner Instrument Company has produced a giant speed indicator, 10 feet high, 4 feet in diameter, with figures 12 inches in height, mounted on an automobile chassis and driven from the transmission shaft. The accuracy of the instrument has been thoroughly tested, and it is further vouched for by a couple of independent indicators driven from the front wheels of the automobile. Running through the streets of the city the speed of the vehicle is visible to all, the intention of the Warner Company being to show the public the rates of speed of various types of vehicles, and to draw attention to the inconsistencies of the present restrictions. The first public display took place a few days ago in New York City, and was witnessed by a number of newspaper representatives, automobile club officials, and the motoring public generally.

THE AUTOMOBILE representative was delegated to swing round a circle on Broadway from Sixty-third street to Sixtieth street at the legal rate of ten miles an hour. The result was astounding. The machine was kept accurately and carefully at the regulation speed.



GIANT WARNER INDICATOR, THE SPEED LAW REFORMER.

as shown by the indicators, and at that rate of travel was passed by everything on the road excepting the heaviest teams. Every automobile, all the street cars, all buggies, all cabs, were violators of the law. In fact, the only law-abiding users of that particular portion of Broadway were, in addition to the auto carrying the indicator, a five-ton electric truck and two or three heavy teams. Had the police enforced in a wholesale manner the regulations they delight in applying spasmodically, 95 per cent. of the drivers of vehicles on Broadway would have been arrested. Another independent test with the gigantic autometer traveling north on Broadway from Sixty-sixth street at ten miles an hour for a distance of one mile showed that only three horse-drawn vehicles were within the regulation limits. On the other hand, the autometer was passed by three automobiles, four street cars, and three horse vehicles, all violators of the law.

Samuel M. Butler, secretary of the Automobile Club of America, made tests with the machine around the southwest corner of Central Park, Broadway to Fifty-ninth and Sixty-third streets. Owing to the congested nature of the streets, the autometer, whose duty it was to point out the offending drivers, was forced to slack up at times to less than the legal limit of ten miles an hour. However, said Mr. Butler, more than 50 per cent. of vehicles of all classes were violators of the speed laws.

In a conversation after the tests, Mr. Butler declared that the present system of regulating the speed of automobiles is not only anomalous but criminally unjust. "To prove its absurdity," said the A. C. A. secretary, motorists should insist on its strenuous application for a few days; the result would be that the whole vehicular traffic of the city would be brought to a standstill. Further, as at present constituted, the law gives a license to reckless driving,

for in certain congested quarters of the city ten miles an hour would be criminal. Legally, however, a man driving at ten miles an hour in a crowded downtown section, where such a rate of speed would obviously be highly dangerous, would be entirely within the law and could not be held responsible for any accident he might cause. Only one solution was possible, namely the abolition of the speed limit, individual responsibility and a thoroughly efficient system of identification for all drivers. The system has been tried in various parts of France with full justice to drivers and all safeguards to the public."

The Warner Instrument Company intends to send the giant speed indicator through all the principal cities of the United States and carry on an active campaign against the present arbitrary speed laws. By educating the public to a more just appreciation of speed, and as a protest against the application of a cast-iron law, it is hoped to pave the way to a more reasonable condition of affairs in the matter of auto legalities.

INFLUENCE OF THE AUTO ON MACHINE DESIGN.

Industrial commentators have been calling attention to the effect the increase in automobile manufacture has had in stimulating other industries, such as tire-making, body-building, upholstering, and so forth, but the most interesting and important phase of this subject is the great progress the automobile has caused in the strictly mechanical field, as represented by the advancement in the making of machine tools, according to James Joyce, the general manager of the American Locomotive Automobile Company, who is a sound authority. Automobile manufacturer represents a mechanical development that reaches far beyond mere design and construction, says Mr. Joyce. To quote him:

"This phase of the progress that has been made, and is now being made, is important because without this remarkable development in machine tools, which has been instigated by the demands of motor car making, the improvement of the automobile to its present standard would not have been possible. There has been a collateral progress in cars and the tools for making them.

"With the evolution of the automobile to a stage of practicability, there began a demand in the factories for varieties of machinery never thought of before, and this demand has continued. Not only have the automobile manufacturers had the best brains in their shops designing new machines for making various parts, but those regularly engaged in the business of making machine tools have been steadily at work in the same direction, so that the best mechanical genius of the period has been concentrated on invention of this sort. The consequent advance in factory machinery has had as much to do with the improvement of the automobile as anything else, especially in respect to attaining accuracy and interchangeability in the parts of cars.

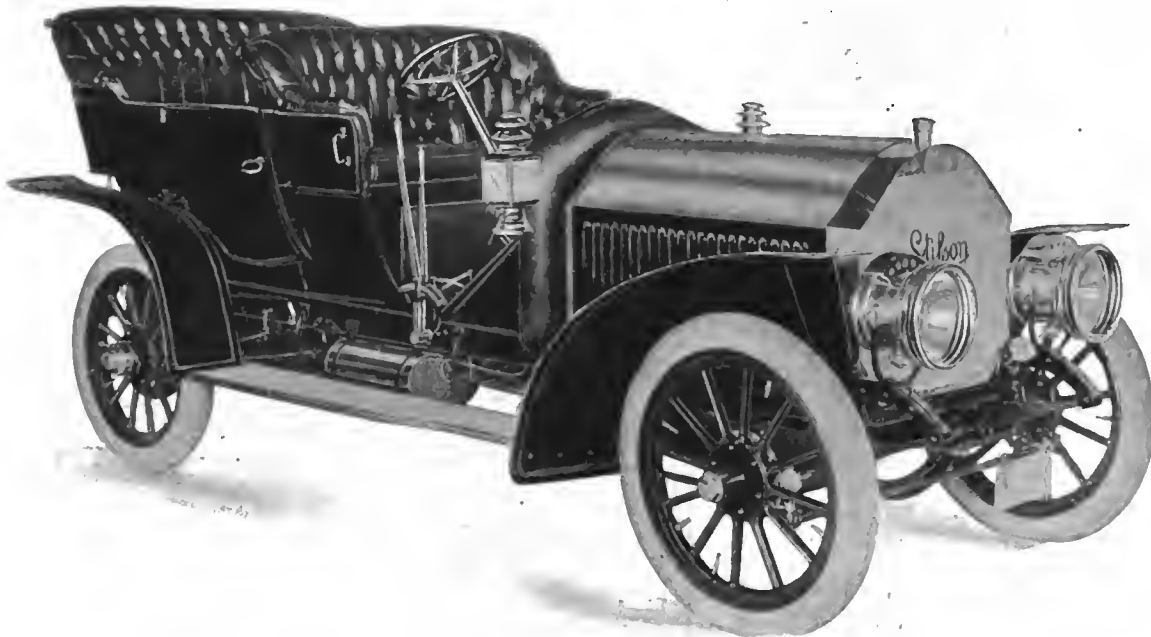
"To enumerate the new tool machines that have been designed to meet the wants of automobile makers would be to give an almost complete inventory of the factory equipment. They are found in every department. The cost of creating and installing these machines has been tremendous, and to those who keep up-to-date, the expense is continuous. The builder of high grade cars cannot balk at any expense, however, for he knows that the future depends upon his product being as nearly perfect as possible.

"In some of this development America has been in advance of Europe, but it is a mistake to think that we use machinery a great deal more than the foreigners do. One of the later inventions in tool work is a machine for grinding cylinders. This is peculiarly an American development, as is another machine for grinding crankshafts, which insures greater accuracy than the lathe work formerly used. On the other hand, we have in the Berlet factory, at Providence, a gear hobbing machine, which cuts gears by a screw-like movement that is infinitesimally precise. This we imported, and there is nothing else like it in this country. We have also at Providence a remarkable milling machine for turning out camshafts, and this is of English design and build.

"The chief respect in which American machine work excels is in the extensive use of jigs and fixtures, by means of which the parts are made in exact replica and are therefore more interchangeable. It is probably true, also, that there has been more new special machinery invented in this country than in all the others put together. Furthermore, it is in the natural course of events that the country which produces the finest and greatest number of machine tool inventions should develop the skilled mechanics to handle them. It is these considerations, in fact, that led the great locomotive concern to do the machining on Berlet cars in their own factory here, while sending to France for the superior materials produced there."

ANOTHER SIX FROM THE OLD BAY STATE

A SILENT six-cylinder 60-horsepower automobile is the unique model produced by the Stilson Motor Car Company, 92 Renne avenue, Pittsfield, Mass. The motive power of the machine is an engine with separately cast vertical water-cooled cylinders, 4 11-16 inches bore and 5 1-2 inches stroke, with interchangeable mushroom type valves on opposite sides. Despite the multiplicity of its cylinders, the engine is particularly compact



THE 60-HORSEPOWER STILSON SIX-CYLINDER LOOKS LIKE A STURDY NEW ENGLANDER.

and the arrangement of piping is such as to give complete accessibility to every working part. The cylinders are mounted on an aluminum crankcase attached to a steel sub-frame, and all gears are completely inclosed and run in oil. Double ignition is provided by a high-tension magneto and by storage battery, spark plugs being in the cylinder heads. The water-cooling system comprises a centrifugal gear-driven pump and a special type cellular radiator of large dimensions and special design. An important matter in six-cylinder engines is the arrangement of the intake piping; this has been carefully worked out on the Stilson, and, as will be seen from the illustration of the intake side of engine, the piping is calculated to give a uniform supply of gas to all cylinders. The carbureter is of the float-feed type and is entirely automatic. Lubrication is provided for by a patent oiling system, the mechanical oiler being gear-driven.

Standard lines are followed in the matter of transmission and drive. The clutch is of the cone type with special leather face. sliding gear transmission is of selective type, giving four speeds forward and reverse, with direct drive on the high. Final drive is by bevel gears to floating rear axle, with clutch-driven hub. Ball bearings are used throughout in the transmission.

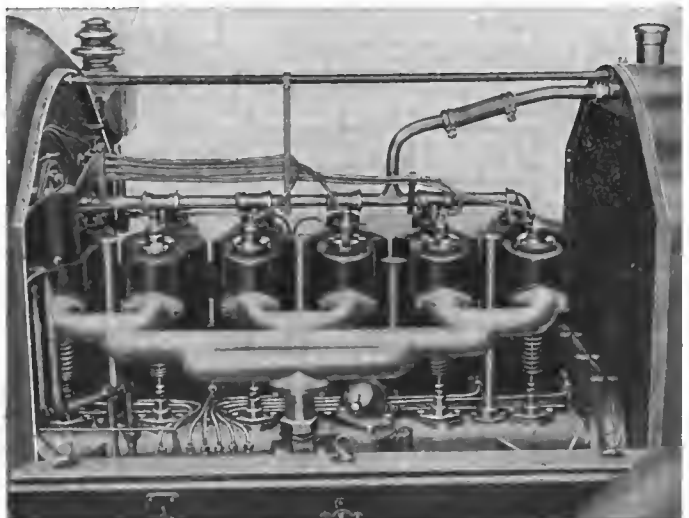
Steering is irreversible, positively adjustable to wear, with fixed wheel. Spark and throttle levers, placed on top of steering wheel, have stationary segment retaining its position independent of position of the wheel.

The framework of the Stilson "six" is of pressed steel cold rolled, with a sub-frame to carry entire power plant, and a metal dustpan completely protecting all mechanical parts. Extra heavy semi-elliptic springs are employed in front and the rear has the same type of suspension, the springs being extra long. Front axle is of I-beam section, nickel steel, with reversed Elliot type steering knuckles and oil-tempered ball bearings. Both braking

systems are on rear wheels, the foot brake operating externally and the emergency brake being of internal expansion type on rear wheel drums, bronze against steel. Thirty-four-inch wheels are carried made of grade A second growth hickory. Wheelbase is 120 inches and tread 56 inches. Any make of American tires may be had with the machine, the dimensions being 34 by 4 inches front and 34 by 4 1-2 inches rear. At the rear of the frame is a 23-gallon gasoline tank, supplying fuel under pressure to the carbureter; a pressure gauge is provided on the dash.

In keeping with the high grade of the mechanical make-up of the automobile is a roomy, comfortable, and well-finished touring body, with easy side entrances. Although a top is not provided on the standard model, the body has received the necessary strengthening irons to allow of its receiving this protection against bad weather. Standard colors are dark red, with light red running gear, trimmed with black. Other color

combinations are obtainable when ordered. The curved dash is of cast aluminum of a patented design, there are running foot-boards and metal mud guards. In the generous equipment are comprised two large acetylene headlights with B. & L. mirrors, generator, two square oil side lamps with red and green stripes on top of glass, rear oil lamp, an autochime operated by foot lever, clock, pump, jack, and full kit of tools and a foot rest. As a powerful family touring car the Stilson "six" has a handsome, comfortable appearance. Fully equipped, the weight of the machine is 2,750 pounds.



RIGHT-HAND SIDE MOTOR SHOWING DESIGN OF INTAKE.



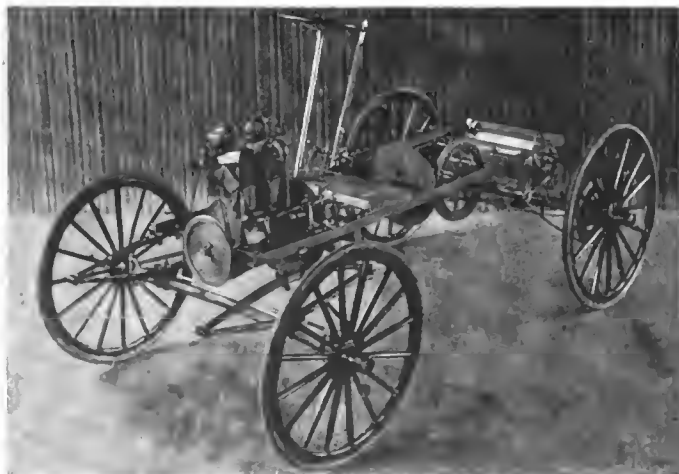
MODEL D ALBANY RUNABOUT WITH FALLING TOP EQUIPMENT.

A BUGGY RUNABOUT FROM INDIANA.

There are four models of the Albany runabout, constructed by the Albany Auto Company, Albany, Ind., designated respectively Models C, B, D, and E. Model C chassis, which is shown below, is the one likely to prove of most interest to the general public and which best serves as a representative of the group.

Complete accessibility is obtained by placing the two-cylinder air-cooled vertical engine under a bonnet forward. Of 4-inches bore by 4-inches stroke, it develops 10-12 horsepower, and has mechanical exhaust and automatic intake valves in the head. Ignition is by jump spark, dry batteries being used. The carbureter is of the automatic float feed type.

Transmission is by metal friction disk with fiber-shod friction wheel pushed into contact with foot pedal transmitting power to countershaft, final drive being by double side chains to sprockets on rear road wheels. All speeds are obtainable from two to twenty miles an hour by operation of the hand lever, reverse and emergency brake being obtained by the same lever. On the countershaft an 8-tooth sprocket is used, 36-tooth sprockets being used on the road wheels. Steering is by inclined column operating worm and segment, with connecting bar behind the front axle. Efficient suspension is provided by four full elliptic springs reinforced by a half-elliptic spring under engine. Angle steel, 2 inch by 1-4 inch, is employed for the frame, engine and gear being mounted direct. Wheelbase is 70 inches, tread 50 inches, and weight 800 pounds. Solid cushion tires, 1 1-4-inch, are employed on 30-inch wood wheels, strongly bolted and running on double roller bearings. Both front and rear axles are tubular



DOUBLE CYLINDER CHASSIS OF THE ALBANY RUNABOUT.

and undivided, giving a road clearance of full fourteen inches. The body is of poplar, with either oak or hickory framework. The seat is upholstered, with spring cushion and back and a commodious space is left in the rear for carrying packages. Color scheme is black body, machinery aluminum and running gear red or Brewster green. Metal mud guards are provided, and the buggy is completely equipped with lamps, tools, etc., and a folding hood.

DETAILS OF THE NEW STEARNS SIX-CYLINDER.

Among the first of the makers to outline their policy for 1908 where the six-cylinder motor is concerned are the builders of the Stearns, who have had a runabout of this type in hand for some time past, and now that it has more than exceeded expectations in its try-out, the details of the new car are made public, but in the same announcement take pains to make clear their position on this much-mooted point. Actually they do not favor the six-cylinder construction, as the multiplication of the cylinders above four is superfluous, while the gain achieved does not compensate for the greater weight and complication necessarily involved. In short, they are quite content to pin their faith during the coming year on the four-cylinder motor, as they have in the past, but, not to be sidetracked where the increasing demand for a six-cylinder high-powered runabout is concerned, they have decided to enter



THE NEW STEARNS "SIX" LOOKS GOOD.

the ranks in order to meet the wants of those of their customers who are bent on having a six-cylinder car.

The new runabout is nominally rated at 45 horsepower, but it is in reality of twice the power, as the new motor has tested up to 90 and 100 horsepower on the brake. The reason will readily be apparent when it is said that the new motor is in practically every respect but a duplication of the standard Stearns motor on a 50 per cent. larger scale. In other words, two additional cylinders of the same size have been added and the features that have hitherto distinguished the Stearns motor have been retained as formerly. The four-cylinder motor is rated at 30-60 horsepower, according to which carbureter of the double system is employed, and consists of four cylinders with a bore and stroke of 5 3-8 by 5 1-2 inches. As the result of considerable study of the problem, the makers have succeeded, with the aid of an additional ball bearing, in mounting a crankshaft capable of delivering 100 horsepower, with possibly a trifle less load per bearing than is the case on the present four-cylinder mounting. A carbureter of the regular multiple jet type, together with a unique design of inlet manifolds, supplies the mixture. The double ignition system, employing a Bosch high-tension magneto on one side and a complete accumulator and coil on the other, is also a feature. Power is transmitted through an expanding band clutch and four speed gear-set of the selective type to the double side-chain drive.

MICHIGAN COMPANY TO BUILD STEAM TRUCKS.

Under the title of the Michigan Steam Motor Company, a firm has been incorporated under the laws of the State of Michigan with a capital of \$250,000, to build three and five-ton trucks, using a steam power plant of special design on which the company controls the patent rights. The officers are: J. F. MacPherson, president; R. Jossman, secretary, and R. T. Armstrong, treasurer, and the office and factory, consisting of a four-story brick building with a floor space of 26,000 square feet and independent power plant, are located at Pontiac, Mich.

The distinguishing feature of the vehicles to be built by this concern, the first of which are expected to be ready in July next, is the use of a 50-horsepower eight-cylinder compound steam motor of the Belknap type, although a number of patents are held on the generator and other essentials of the power plant to be used. The engine itself is very simple in construction, the cylinders being placed according to the twin tandem arrangement, each unit consisting of two cylinders cast integrally and each pair of units being staggered at an angle of 90 degrees on the crankcase, all the valve mechanism being placed between the cylinders, thus making the motor very compact as well as very accessible. The generators are tested to 1,000 pounds by hydraulic pressure, but have been run in tests at 350 pounds, which pressure will doubtless be adhered to. An automatically controlled fuel supply maintains the pressure at any point desired, extinguishing the fire when it rises too high and relighting it when it falls.

MORE TRADE CHANGES AT THE HUB.

BOSTON, June 3.—A notable change in local trade circles during the past week has been the purchase of the business of the F. T. Kimball Company, of the Motor Mart, agents for the Corbin, by the Corbin Motor Vehicle Corporation, which will continue the agency as the Corbin Car Company of Boston, the new concern having been incorporated under Massachusetts laws with B. B. Bassette president, E. H. Brandt vice-president, E. T. Kimball treasurer, and B. Frank Blaney secretary. The new concern will handle the New England business, and Mr. Blaney has just started on a trip with a car through the territory. He is accompanied by H. E. Wilson, formerly of the Rambler branch, who has just joined the Corbin forces.

V. A. Charles, who has been a salesman at the Thomas B. Jeffery & Co. New England branch, in this city, for several years, has been appointed manager to succeed C. E. Gilmore who recently resigned to become traveling representative of the Knox company, of Springfield. Mr. Charles is well acquainted with the New England trade and with the Rambler product, and is well equipped to look out for Rambler interests.

BIG ADDITION TO THE MORA PLANT.

NEWARK, N. Y., June 3.—Six acres of ground are being broken for an addition to the plant of the Mora Motor Car Company. The new building, situated alongside the Northern Central Railroad tracks, will be of two-story modern mill construction, 400 feet long, and, in addition to the plant now occupied, will enable the Mora Company to treble its force before fall.

The Racytype Mora Roadster is speedier than first anticipated. Several satisfied owners claim sixty miles per hour is an easy accomplishment.

LOGAN COMPANY INCREASES CAPITALIZATION.

CHILlicothe, O., June 3.—The Logan Construction Company, manufacturers of Logan motor cars, has found it necessary to increase its capital stock to \$250,000. The Logan company began business some seven years ago with an output of six cars, and to-day it is producing thirty cars a month, and is behind with its orders. While its trucks and light delivery wagons have met with gratifying success, its 20-24-horsepower runabout, which did excellently in the recent Harrisburg endurance run, is finding a ready sale.



THE RAMBLER THAT WAS CONVERTED INTO A "CHEMICAL."

REMODELING A RAMBLER INTO A FIRE ENGINE.

LONG BEACH, CAL., May 30.—With a desire of being strictly up-to-date, and having nothing readily available to meet their requirements, the fire department of this place hit upon the expedient of attaching a chemical apparatus to the rear deck of a Model 21 Rambler. This car, being regularly fitted with a detachable tonneau, it was only necessary to remove the tonneau, and set the apparatus into place, as shown in the photograph. The outfit, when completed, was put to very rigid tests to compare it with the horse-drawn type. On one occasion it reached a fire, in two minutes from tap of gong, three-quarters of a mile away, over rough streets and railroad crossings.

So successful has this outfit (which weighs 1,000 pounds and carries two men) proven, that the department here is designing several others of a more elaborate form, providing for full complement of firemen, and in some cases more elaborate apparatus. An interesting feature is that the machine was not prepared by the manufacturers of the Rambler, but was designed and adapted to a stock Model 21 chassis by the Long Beach fire department.

"BUFFALO BILL" TRIES AN AUTOMOBILE.

Should Col. W. F. Cody (Buffalo Bill) prove as efficient an auto driver as he is a horseman, automobilists will sit up and take notice when his car goes by. P. A. Williams, Jr., sales manager of the Atlas Motor Car Company, Springfield, Mass., which factory Col. Cody visited while in that city, states that his uncle, George H. A. Williams, of the Abbott-Downing Company, Concord, N. H., built the old stage coach forty years ago that is now used daily in the Wild West show.



COL. WILLIAM F. CODY IN THE 1908 ATLAS RUNABOUT.



F. S. DIMMICK IN HIS WALTHAM-ORIENT AT BRIDGETOWN.

A BIT OF AUTOMOBILING IN BARBADOES.

From the Barbadoes *Advocate*: "On Sunday last Mr. and Mrs. F. S. Dimmick motored out to Beachmont Hotel, Bathsheba, going down by way of Newcastle Hill. In speaking of the work of his car, Mr. Dimmick says that there are some very severe gradients with not the best of surface between New Castle estates and the hotel, but the car took them all cheerfully, even stopping in the middle of one of the steepest to permit a restive horse to be led by, and picking up and continuing without any trouble. The return was by way of Horse Hill, and we believe that this is the first time that an automobile has made the ascent without assistance, to say nothing of carrying its full load all the way, as did Mr. Dimmick's Waltham-Orient. An enthusiastic crowd witnessed the climb, and Mr. Dimmick was informed that all other cars attempting the hill had been either pushed or towed up. The successful accomplishment of such a feat not only demonstrates the great hill-climbing powers of the little car, but shows that its air-cooled motor is up to the hardest kind of work in this tropical climate."

SEATTLE TRIES KNOX AUTO PATROL.

SEATTLE, WASH., June 1.—Seattle's automobile patrol is in action. The car has already made its first run, going into commission last Saturday night, when it did a good day's work, and did all that could be expected of it. The car is a 20-horsepower double-cylinder Knox, and will hold twelve prisoners. The front and sides are screened with heavy netting. If the patrol proves a success a second will be purchased and placed in service as soon as the manufacturers can supply it.



KNOX AUTO POLICE PATROL IN SERVICE AT SEATTLE.

TRAVELING AUTOMOBILE NEWSPAPER PLANT.

WAUKEGAN, ILL., June 1.—Frank H. Just, a newspaper publisher, has converted a runabout Rambler into a portable newspaper office. He publishes a daily paper in Waukegan and a weekly in Libertyville ten miles distant. Editor Just built a sort of torpedo deck on his machine and inside he carries a number of type galleys. Matter that he uses in his daily is carried over to Libertyville, the galleys fitting in the deck one above another so that they do not disturb one another. Formerly the editor carried the galleys with him on a trolley line, but he finds the auto arrangement a great improvement over the interurban.

Owners of valuable horse-flesh in Lake county have come forth with a queer proposition intended to lessen the danger of horses scaring at automobiles. They claim that the animals take fright at the brilliantly painted cars only. They suggest that cars be painted a uniform color, some subdued hue, brown black or blue. The men who advance this argument say that there are more runaways from red and white painted cars than from any others.

A VETERAN FRANKLIN AND ITS OWNER.

A. B. Case, of Springfield, Mass., owns Franklin automobile 592. Recently he wrote to the maker: "My Franklin 592 has entered upon its fourth year of service. I have had the body



"BENJAMIN FRANKLIN" IN HIS FOUR-YEAR-OLD FRANKLIN.

cleaned and varnished and running gear painted and the machine looks like new." Mr. Case in a recent carnival dressed to represent Benjamin Franklin to quite good effect and with his car made a hit in the procession.

SOME "DON'TS" WORTH REMEMBERING.

From the instruction book of the Peerless Motor Car Company, Cleveland, O., the following excerpt of valuable hints to drivers of cars is taken for the benefit of our readers:

Don't try to start without the switch turned on.

Don't try to start without seeing that the spark lever is retarded.

Don't start motor without first making sure that the speed lever is in neutral position.

Don't try to run without oil, water and gasoline.

Don't crank a motor, that is, don't turn it over the compression, more than three or four times after priming. If it does not start at once there is something wrong.

Don't drive fast around corners; it is dangerous and destructive, especially to tires.

Don't allow an automobile to stand in cold weather with pure water in the circulating system. It will freeze and burst something. In cold weather use some good anti-freezing solution.

Don't run a motor fast when the automobile is standing still; there is no worse abuse.

Don't advance spark lever too fast or too far (crankshafts can be broken by injudicious use of spark advance).

BRITAIN'S CLUB SOLVING THE DUST PROBLEM

By JOSEPH F. MACKLE.

LONDON, May 23.—To-day have commenced some interesting tests organized by the Roads Improvement Association, in conjunction with the Motor Union and the R. A. C. Tar coating of roads has long been known as a satisfactory dust preventative, but the usual method of applying the tar by hand has rendered the work too costly for general adoption. The present trial has for its object the discovery of an efficient machine which will spray the tar into the top crust of the road and bind the surface material together. No less than eight machines have been entered, and preliminary trials have indicated that the work can be done much quicker and at less cost than by former methods, and in consequence a big spread of dust-laying efforts may be looked for. Having found a suitable machine, the right material must be provided and accordingly a second trial is being run to test the respective merits of seven tar preparations which have been brought forward. The present experiments have attracted much attention from road surveyors and similar officials and representatives of these, together with two well-known municipal engineers who have joined the committee, are devoting their efforts to the satisfactory solution of the dust problem—the factor militating most strongly against automobilism at the present time.

But while much can be done in the way of improvement of the highways—which are naturally not in perfect condition after sixty years of comparative disuse—car design is a matter which is much to blame for the present evil. Pressure fuel tanks at the rear have got to go, and in like manner sweeping mudguards must be abolished. Exhaust silencers blowing on the road are also great offenders and a surprisingly large number of cars transgress in this way. Much can be done with a smooth underscreen extending to the rear axle.

To give some definite idea of what is being done in this direction and also, let it be hoped, to point out the glaring offenders, the R. A. C. proposes an interesting trial on the now almost completed three-mile track at Brooklands—the world's first automobile speedway. An even coating of limestone dust will be laid down and the competing cars will be run over this at fixed speeds. Photographic evidence will be taken for the purposes of comparison, which method has been found by previous experience to give entire satisfaction.

Endurance and Reliability Runs.

While there were comparatively few entries for the tourist trophy races, the same lack of interest on the part of the trade is not manifested towards reliability contests. The Irish Automobile Club's event is in progress for the last four days of this week, seventy-five cars running in the various sections over the 600-mile course. For the Scottish Trial at the end of June a still better muster has been obtained and even the total of 105 would have been further increased had not the closing date of entry been strictly observed. Seven cars will uphold America's reputation in this event—two White steamers, two Fords, a Buick, Maxwell, and Cadillac.

The private reliability trial is becoming no less popular than these free-to-all contests, and certainly the publicity gained by a successful run well repays the expense and trouble involved. The victorious Siddeley ran through its allotted 10,000 miles with but one stop, this being an extraordinary mishap in the shape of a broken change-speed lever. The six-cylinder Hotchkiss, fresh from its long French tour, set off immediately to break this record and after reaching its 12,000th mile on English roads has now started to explore Ireland, incidentally going through the Irish Club's Trial. Later on the Scottish Trial will be essayed and thereafter the car will go on running till something happens.

The White steamer and the six-cylinder Rolls-Royce also have just concluded an 1,800 miles observed run without trouble, the

route taking these rivals to the heart of Scotland and back. Contrary to expectation, it turns out that this is not the widely announced contest which (it is said) is going to finally settle the vexed steam vs. gasoline engine question, but is merely a friendly encounter preparatory to the trial proper, which will come off in early autumn.

Show Exhibitors Object to Uniform Decorations.

At the present season of road contests it is a far cry to the shows, but it may be of interest to note that the proposed scheme of uniform stand decoration at the next Olympia exhibition has been dropped. The storm of discussion aroused by the idea foreboded its eventual abandonment, for while those firms which formerly spent large sums on striking decoration objected to their loss of distinction, the other parties who cared not for such glitter loudly cried out against the big expense of the proposed scheme. Hence this year's show, which is dated for November 11-23, will be as variegated as ever. A timely denunciation of the auto-cad who amuses himself with sirens and exhaust cut-outs has been issued by the R. A. C. committee.

ENGLAND RETAINS THE TOURIST TROPHY.

DOUGLAS, ISLE OF MAN, May 30.—Britain's most important automobile contest, the race for the Tourist Trophy, has resulted in a victory for the Rover machine, driven by E. Curtis. The heavy touring car race, run on the same course and at the same time, was won by another English machine, a 30-horsepower Beeston-Humber, driven by G. P. Mills.

Owing to a drenching rain the roads were exceedingly slippery and mishaps to valuable cars were as a consequence somewhat numerous. The authorities were so impressed with the bad nature of the road that the heavy cars were allowed an extra gallon of gasoline. The course was from Quarter Bridge, Douglas, to Peel, via Union Mills, Crosby and Ballacraigne; from Peel, via Coat road through St. Germain's to Ramsey and then back to Douglas over a mountain road to Snaefell. Six rounds of the course had to be made by the light cars, giving a distance of 241.5 miles; the heavy cars had to go round five times.

There were twenty-three machines in the Tourist Trophy class, thirteen of them being British, and nine in the heavy touring car race, six being English and three French. At the commencement of the last round six cars had a winning chance. Three miles from home A. Lee Guinness, driving an 18-horsepower Darracq, appeared a likely winner, but victory was robbed from him by his gasoline supply running out. Only four cars finished on their gasoline allowance, two in each class. They were in the light class a 20-horsepower Rover (E. Curtis), 8:23:27; 16-20-horsepower Beeston-Humber (James Reid), 8:35:17-1. In the heavy class the two finishers were a 30-horsepower Beeston-Humber (G. P. Mills), 7:11:1, and a 25-horsepower Gladiator (G. Fenton), 7:31:35:1. The average speed of the winner is about 28.2 miles an hour, compared with nearly forty miles an

FRENCH VICTORIOUS IN ISLE OF MAN HILL CLIMB

In the hill climbing competition for the *Graphic* trophy, J. E. Hutton's 60-horsepower Berliet was first in 3:40-2, J. Watson's Berliet being second in 3:45-3. Third position was taken by the English Daimler, owned by T. Henshaw, its time being 3:50-4. The contest was held on Slein Lewaigne Hill, near Ramsey, where the course has a gradient of 141 yards in 2,500 yards. The total length of the course was two miles three furlongs, and the steepest part a rise of one in twelve a mile before the finishing point. Vehicles had to be of touring type and carry four passengers. There were fourteen entries.

HOW ALBERT CLEMENT MET HIS DEATH.

PARIS, May 24.—From an examination of the spot on which Albert Clément met his death while training on the Dieppe circuit for the Grand Prix, with a Bayard-Clément machine, it appears that he took an easy turn at too wide an angle. At sixty miles an hour his car ran off the road onto the wide, grassy border. After running over this for nearly fifty yards, it was just about to straighten out to regain the middle of the road when the front wheels struck a bank of earth. Gauderman was thrown out, but Clément was carried along a prisoner in the car, which jumped twenty-five meters, fell across the road and rolled over twice. Clément suffered a fracture of the skull and of the vertebral column and expired a few minutes after.

Gauderman, who was riding with Clément at the time, and who had a miraculous escape, gives the following account of the disaster:

"We left Londinieres at seven o'clock in the morning, Albert Clément driving the machine with which he was third last year in the Grand Prix, and which I was to drive in the coming event. He was thus perfectly familiar with the car. The morning was exceptionally cold, and when we stopped at Eu to take a bowl of hot coffee, Clément bought a pair of heavy gloves and slipped a newspaper under his jersey to protect his chest. While we were here Gabriel and Rougier, who had left Londinieres behind us, passed on a touring car. On starting out again Albert said 'We will catch up Gabriel.' I am certain that Albert Clément was preoccupied or distracted immediately before the accident. Thus, although it was the machine he had driven last year, I noticed that he persisted in remaining in third speed. After Triel, on a straight stretch of road, he said:

"The machine is not pulling this morning."

"Well, you are running on third."

"So I am," he replied.

"Albert then put in his fourth, and it was on this gear that we entered the fatal turn at Saint-Martin-en-Campagne. Albert missed his turn. This is the only cause of the accident. He took the turn too wide, and in an instant was on the grassy border. We did not skid, nor did the car drift. At this moment there was no sense of danger; we did not even feel any shock from the two ditches we passed over, and of which so much has been spoken. We did not even notice the large blocks of wood which we grazed in our passage. Suddenly there was a violent shock. We had struck a bank of sand, which, being covered with grass, was not visible at any distance. I was thrown out, but I distinctly saw the car pass under me, Albert carried along with it. When I recovered consciousness Albert was dead, crushed under the car, which had turned over twenty-five meters away and was a complete wreck."

Albert Clément's funeral service was held at Saint-Pierre-de-Neuilly, the church in which his sister was married to Ferdinand Charron but three weeks ago. A subscription list has been opened for the erection of a monument to his memory.

ANOTHER GRAND PRIX CANDIDATE KILLED.

PARIS, May 30.—While driving the 120-horsepower Darracq racer originally intended for Wagner in the Grand Prix, Marius Pin entered into collision with a horse vehicle between Epernon and Rambouillet, and was killed almost instantly. The accident was caused by the horse taking fright and obstructing the road. M. Hériot, proprietor of the Louvre department store in the Rue de Rivoli, Paris, bought the machine from the Darracq Company only a few days ago, with the intention of running it in the Grand Prix with his chauffeur Pin as driver. The front part of the machine was smashed, but the engine and transmission escaped injury.

Although M. Pin had never driven in auto races, he has always been connected with powerful cars. In 1903 he was Janatzy's mechanic in the Paris-Madrid race. Last year he gained a little notoriety as the hero of an event in which an American family figured. Having missed the special boat train from Paris

to Cherbourg, two American ladies, who had booked their passage on a transatlantic steamship, endeavored to charter an automobile to carry them to the seaport. Several of the firms to whom they made their pressing demand refused the journey. Finally, C. M. Charley, of Mercedes interests, offered his private 90-horsepower Mercedes, with Pin as driver. Although the express train had got an advance of more than an hour, Pin raced out with the automobile, and reached Cherbourg a few minutes ahead of the train, thus securing for the ladies a journey across the Atlantic as originally intended.

A.L.A.M. MAKES SHOW PLANS AND TALKS ROADS.

Tuesday was managers' day at the Association of Licensed Automobile Manufacturers headquarters, for there was an all-day session of the Board of Managers, which held its semi-annual meeting in New York. As the chief results of its work, the demonstrating car will no longer be a feature of the Garden show, and motorcycles will be admitted to take their place with the cars, being placed in the commercial vehicle section. Demonstrations are not to be eliminated altogether, but they will be taken care of henceforth by local agencies from their own establishments. Owing to the resignation of Carlton R. Malbey from the show committee, Marcus I. Brock was reappointed a member of it, having retired but a few months ago.

Next to show matters, good roads came in for considerable attention, and the board appropriated \$5,000 to be used in furthering the cause, at the discretion of a good roads committee to be appointed later. E. R. Thomas, S. T. Davis, Jr., Albert L. Pope, Thomas Henderson, H. A. Gillis, and R. D. Chapin expressed their views on the question at length, Mr. Thomas being particularly enthusiastic. The committee will work in conjunction with that of the American Motor Car Manufacturers' Association and other organizations throughout the country. The handbook committee—W. E. Metzger, L. H. Kittredge and Thomas Henderson, announced that the 1908 handbook would be ready for distribution at the show. Those present at the meeting were:

Elmer Apperson, Apperson Bros. Automobile Company; H. A. Gillis and H. M. Coale, Autocar Company; W. C. Durant, Buick Motor Company; William E. Metzger, Cadillac Motor Car Company; E. H. Brandt, Corbin Motor Vehicle Corporation; M. J. Budlong, Electric Vehicle Company; J. H. Becker, Elmore Manufacturing Company; H. H. Franklin and G. H. Stilwell, H. H. Franklin Manufacturing Company; C. H. Haynes, W. M. Gunderson and C. C. Cartwright, Haynes Automobile Company; E. R. Hewitt, Hewitt Motor Company; E. H. Cutler, Knox Automobile Company; S. T. Davis, Jr., and A. W. Robinson, Locomobile Company of America; H. A. Lozier and Edward Lozier, Lozier Motor Company; C. W. Matheson, Matheson Motor Car Company; V. M. Gunderson, Northern Motor Car Company; Angus Smith, Olds Motor Works; H. B. Joy and S. D. Waldon, Packard Motor Car Company; E. H. Parkhurst, Peerless Motor Car Company; Charles Clifton, George N. Pierce Company; George Pope and C. E. Walker, Pope Manufacturing Company; Albert L. Pope, W. C. Walker and A. E. Schaaf, Pope Motor Car Company; E. D. Shurmer, Royal Motor Car Company; Aiden Sampson, 2d, Edwin McEwen, F. B. Stearns Company; C. C. Hildebrand, Stevens Arms & Tool Company; W. R. Innis and T. W. Goodridge, Studebaker Automobile Company; E. R. Thomas and R. D. Chapin, E. R. Thomas Motor Company; Fred Kuser, Walter Automobile Company; E. B. Chaifant and E. S. Church, Waltham Manufacturing Company; Thomas Henderson, Winton Motor Carriage Company.

DARRACQ MACHINES WILL ALL RACE.

PARIS, May 27.—All is now settled regarding the Darracq racers built for this season's international contests. The Darracq Company maintains its decision not to race officially as a protest against Wagner passing over to Fiat. M. Raoul d'Arnaud has bought the machine which should have been in Wagner's hands and has selected Caillois to drive it in the Grand Prix. M. Hériot, son of Commandant Hériot of the French army, has bought another and will place his own mechanic, Marius Pin, in charge of it for the race on the Dieppe Circuit. The third one has been bought by a private individual who will engage Demogot as driver, or Théry if possible.

For the German Emperor's race the three machines have been bought by Vincenzo Florio, M. Brenda, a French sportsman living in Germany, and an Italian sportsman who hides his identity under the name of d'Ollorip. These three machines will also compete in the Brescia Circuit in northern Italy.



OUR STRENUOUS CHIEF EXECUTIVE RIDES IN A REO.

For probably the third or fourth time in his life, President Roosevelt utilized the automobile as a means of conveyance, being driven out to the State Agricultural College at Lansing in a Reo with Secretary Loeb and R. E. Olds.

NEW YORK STATE "BLUE BOOK" READY.

Another of the three volumes of "The Automobile Official A. A. A. Blue Book" for 1907 has made its appearance. The second to be issued, it bears the title Volume I. and deals with New York State and Canada, with extension routes to and from the Middle West. No time or expense has been spared to supply reliable information on the districts dealt with and the constant changes in highway improvement, making the inferior road of to-day the best to-morrow, have received close attention.

As a convenience to users, a number of New Jersey routes have been included, giving the principal connections from New York to the mainland and shore lines of that State. A convenient arrangement is a preface map showing the entire country dealt with in Volume I, with figures in circles referring to the title pages of sections in the book. Much new work has been done in indicating automobile routes in the Middle West, twenty-four of the most important being outlined in clearer and better form than ever before. Special pains, too, have been taken with city maps in the West; even when it was not always possible to obtain a complete and accurate description of the highways, the routes into and through Western towns have always been prepared with perfect accuracy.

The tabular pages on automobile laws and regulations have been revised and made correct up to the time of sending the volume to press. Steamship connections to New England, Atlantic ports and the West Indies are also presented in convenient tabular form, and information on European regulations is given in the same manner. Hudson river boat lines and ferries are dealt with both tabularly and by diagram maps. The Blue Book is published by the Class Journal Company, publishers of THE AUTOMOBILE, Flatiron Building, New York City.

NATURAL RUBBER HAS A NEW RIVAL.

Harry B. Cox, a Hartford, Conn., chemist, claims to have discovered, after long laboratory researches, a substitute for natural rubber. The new substance, to which the name Halcox has been given, has a close similarity with natural rubber, can be compounded as readily as the natural gum, and can be vulcanized or cured with even greater facility. Its most important advantage is that it can be produced in any required consistency—liquid, semi-liquid, plastic, or stiffer if required. With Halcox it is claimed that there is no variation in product, each lot being identical in make-up and consistency. Cost of manufacture will allow Halcox to be produced at a lower figure than crude rubber can be worked up into a saleable form, and it is said to be capable of quick production in large quantities.

ILLINOIS NOW HAS NEW AUTO LAW.

SPRINGFIELD, ILL., June 3.—Illinois at last has a State automobile law, which places the regulation of this form of transportation entirely in the hands of the State authorities. The bill providing for the regulation of automobiling by the State became a law at midnight last Friday, without the Governor's signature, the necessary ten days having elapsed since it was placed in the hands of the Executive after having passed both branches of the Legislature. The new law will be placed upon the statute books and become effective July 1 next.

In brief, the law requires that all owners of motor vehicles must secure a license from the Secretary of State; provides for State registration and numbering of machines; defines and fixes speed limits; fixes rules of the road; provides for the registration of chauffeurs; registration of manufacturers and dealers; excepts non-residents from registration under certain conditions; in addition to numerous other minor regulations, fixes the fines which are to be collected for violations of the act.

The law is highly acceptable for the most part to automobile owners throughout the State, and was championed vigorously by the Illinois State Automobile Association. At many times it appeared as though it would fail of passage through the opposition of country members who were hostile to the section taking away the power of regulating automobiles from municipalities.

Two years ago a similar measure was vetoed by Governor Deneen, but the present bill was so drawn as to obviate all objections contained in the Governor's veto message on the subject. As the present measure was finally passed by practically a two-thirds vote of the Forty-fifth General Assembly, and as the only objection was the section taking away the power of municipalities to regulate, meeting all other objections which have been raised to the former automobile measure, the Governor permitted it to become a law without his signature.

NEWS OF THE LONG-PROMISED FRENCH CABS.

The gasoline taximeter cabs which the New York Transportation Company has solemnly promised to bestow on the city before the end of the year will be a mixed company, principally from the Delahaye and De Dion Bouton factories in France and the Maxwell works in this country. The first batch of nine Delahayes are expected to be here very shortly, and further consignments will arrive at monthly intervals. A number of these vehicles are at present in use in Paris and London. They are equipped with a four-cylinder 18-horsepower engine carried forward on a pressed steel frame, have three speeds forward and reverse, and shaft drive. A plain but elegant landaulet body, which can be completely open in summer, will be supplied with the machines by a Parisian body builder.



E. R. THOMAS TRIES OUT A VANDERBILT CUP RACER.

With George S. Salzman at the wheel, E. R. Thomas, the Buffalo manufacturer, put one of the racers he is building to annex the Vanderbilt cup, through its paces at Kenilworth Park near Buffalo on Memorial Day.

CLEVELAND'S HUSTLING CLUB IS BUSY.

CLEVELAND, O., June 3.—The Cleveland Automobile Club has made extensive preparations for its annual hill climb, to be held Saturday of this week on Gates Mill hill. The hill has been improved and graded to allow for high speed at all points. One point of advantage about this contest is that there will be no long waits and the contests will be run off in rapid succession. This is possible owing to the fact that the cars do not return by way of the hill, but run back to the starting point by another route.

Steam cars will not be barred at Gates Mill, as they were at Wilkes Barre, and in the open events, as well as in the price classes, they will be permitted to compete against the gasoline cars. There will probably be two or three special events for electric, as two or three makers have expressed their intention of entering cars of this type.

The touring committee of the Cleveland Automobile Club has arranged for a club tour, July 3 to 10, inclusive, to Watkins Glens, N. Y. The route selected by the committee is through Buffalo, Dansville and Bath, passing the New York State fish hatcheries near Hammondsport. The run is about 800 miles round trip over some of the best roads in this section of the country. The tourists on Saturday and Sunday will be the guests of the Seneca Yacht Club.

The Cleveland Automobile Club has secured within \$5,000 of the amount needed to complete the model road, which the club proposes to build on the Euclid road between East Cleveland and Wickliffe.

The Cleveland Automobile Club has appointed a committee to devise ways and means for the entertainment of the A. A. A. tourists who will congregate in Cleveland a day or two before the start of the tour from Cleveland, July 10. This committee consists of George Collister, Walter C. Baker and Asa Goddard.

RUNS OF THE MINNESOTA ASSOCIATION.

MINNEAPOLIS, MINN., June 3.—An endurance run will be held under the auspices of the Minnesota State Automobile Association late in July, if present plans materialize. The affair will be known as the "Little Glidden Tour," and the route will be between the Twin Cities and Superior, Wis., and Duluth, Minn. Frank M. Joyce, president of the Minnesota Association, has been over the proposed route and believes it to be a splendid route for such a test. In places there is enough sand to make the best of machines show the mettle they are made of.

The first tour of the Minnesota Association will be held June 22, when a run from St. Paul and Minneapolis will be made to Mankato, where the quarterly meeting of the Minnesota body will be held. On the way down the route will include the towns of Shakopee, Jordan and St. Peter. The return will be made via Waterville, Faribault and Waseca. The distance each way is 125 miles. The trip will be in charge of George H. Daggett, chairman of the State Touring Committee, and a member of a like committee of the National Association.

CARS WANTED FOR NEW YORK ORPHANS.

Automobilists of the Metropolitan district who want the opportunity of doing a most kindly act have an eleventh-hour chance by notifying S. A. Miles, No. 7 East Forty-second street, that their cars are at the disposal of the Orphans' Day Committee of the New York Motor Club, whose event will take place on Wednesday, June 12. Though the club has obtained over a hundred cars, it needs at least a score more in order to provide for the generous number of orphans which it hopes to entertain by a ride to Coney Island, a visit to the wonders of Dreamland, and a feast that will be appreciated by many hungry little mouths. Therefore, after reading this appeal, notify Mr. Miles at once by letter or telephone—his telephone is 4868-38th—that your car is available bright and early on the morning of June 12.

ENTRIES FOR SEALED BONNET CONTEST.

Routes for the four-day contest to be held under the auspices of the Automobile Club of America on June 19 to 22, inclusive, having been decided upon, the contest committee and the Bureau of Tours are busy surveying and preparing road directions. Four different routes of 150 miles each have been selected. The first day's run is along the Hudson to Poughkeepsie and return; the second up the Harlem valley, through White Plains, Mt. Kisco, Pauling and return; the third along the Sound to West Haven and return, and the fourth to Bridgeport, returning via Danbury, Pauling and the Harlem valley, as on the second day. The high-powered runabouts will have to travel twenty-five miles more per day than touring cars in the same class, but will follow the same routes, with the additional run to cover each day.

Fourteen cars have already been entered in two classes, those in Class A, composed of cars selling for more than \$3,000, being the American Locomotive Company, one Berliet touring car; Lozier Motor Company, two Lozier touring cars; Locomobile Company of America, three Locomobile touring cars; Wyckoff, Church & Partridge, one Stearns touring car. In Class B, which includes all cars selling between \$1,500 and \$3,000, the following have been entered: George J. Scott Motor Company, one Glide touring car; A. M. Day, one Elmore touring car; Locomobile Company of America, three Locomobile touring cars; Atlantic Motor Car Company, one Stoddard-Dayton touring car and one Stoddard-Dayton runabout. The entries will close with the contest committee at the clubhouse on Wednesday, June 12.

BUFFALO CLUB AFTER COUNTRYHOUSE.

BUFFALO, N. Y., June 3.—The Buffalo Automobile Club is negotiating for the purchase of the Larkin homestead on the north end of Lock street in the city of Lockport. The property is owned by Henry Steiner, but the club, it is said, desires to have the place remodeled and used for club runs from Buffalo to Lockport over the new Transit Road. The consideration asked is in the neighborhood of \$10,000. The house is a handsome one on the colonial style, situated on a high ridge, and overlooks the vast plain extending to Lake Ontario.

Fifty new members to the roster of the Automobile Club are expected to be added soon. That number of applications was received up to yesterday, and it was only a month ago the members elected sixty-six new automobilists.

President White has appointed a committee of ten from the club membership to serve as special police officers. The committee will be sworn in this week by the Police Commissioners.

DETROIT TO HAVE SEALED BONNET EVENT.

DETROIT, MICH., June 3.—June 15 is the date set by the Detroit Automobile Club for the first extended run of the season, at which time a 100-mile non-stop contest will be pulled off. Starting from this city, an angling course will be followed, the race ending at the club's quarters at Pine Lake. Prizes will be awarded the winners in the three classes established, one division being for cars weighing over 3,000 pounds, another for those between 1,500 and 3,000 pounds, and the third for those under 1,500 pounds. All hoods will be sealed and wired before the start, and no repairs, adjustments or replenishments of any kind, save tires, will be permitted. Entries are coming in at a rapid rate, and a spirited contest is promised.

SCHOOLEY'S MOUNTAIN CLIMB ON JULY 4.

It is practically arranged that there will be a climb of Schooley's Mountain, N. J., on July 4, and conducted under the management of the energetic W. J. Morgan, who has secured permission for the holding of the contest, which will be limited to stock cars. Schooley's Mountain is about fifty miles from Newark, and within five miles of Hackettstown. The course will be about 1½ miles, and the mountain road will be extensively repaired.

JERSEYMEN ORGANIZE GARAGE ASSOCIATION.

ASBURY PARK, N. J., June 3.—Automobile dealers in this vicinity have organized the Seashore Garage Association, with headquarters in this city, for the purpose of equalizing garage and charging rates and formulating a uniform price list for supplies and accessories. Membership will be sought with the New York association.

At a meeting in Eagle Hall last week the association was formed, representative automobile men from Lakewood, Spring Lake, Belmar, Long Branch, Elberon, Deal, and Asbury Park being present. C. R. Zacharias, of Asbury Park, was elected chairman, and Robert W. Boone, of this city, secretary. A committee consisting of Charles Keene, of Deal; Mr. Strummel, of South Elberon, and J. H. Johnson, of Spring Lake, was appointed to formulate a constitution and set of by-laws. A committee on rules consists of Joseph B. Hoff and John H. Aaring, of Lakewood, and E. J. Harrington and Mark Guy, of this city. A banquet followed the meeting.

AMERICAN NAPIER COMPANY REORGANIZES.

Under date of June 3 the incorporation of the Napier Company of America in Boston is reported. No facts or figures as to the details of the reorganization of the company that has been building Napier cars in this country for several years past, and which recently went to the wall, are made public, other than the bare statement that the company has been incorporated with this title under the laws of Massachusetts. The capital is \$200,000 and the officers are: President and treasurer, Otto B. Cole, Boston; clerk, Hugh W. Ogden, Brookline. The only apparent connection between the new regime and the old is to be found in the fact that Mr. Ogden figured as attorney for Vice-President Farnsworth of the old company, who was appointed its receiver in bankruptcy. The former concern was known as the Napier Motor Car Company of America, and was capitalized at \$600,000, but whether it ever made or sold any cars, except in the immediate vicinity, does not appear.

TWENTY-NINE IN ONE DAY 200-MILE TEST.

At 6 o'clock this morning the first of the twenty-nine cars engaged in the New York Motor Club's 200-mile run was sent away along the Hudson river road to Poughkeepsie. The others followed at intervals of one minute. From Poughkeepsie the route of the run is through Millbrook, Amenia, and Lakeville, to the Berkshire Hills, and then via Salisbury, Great Barrington, and Lenox to Pittsfield. From this point the course is eastward to Chatham, thence northward to Albany. Following is a list of the competitors in the order in which they were started:

1. Prayer-Miller, H. H. Knepper; 2. Corbin, James Swan; 3. Dragon, John Haynes; 4. Stoddard-Dayton, Ray Howard; 5. Knox, H. M. Davis; 6. Mora, F. Cimdrott; 7. American, H. E. Trevor; 8. Continental, C. S. Johnston; 9. Lozier, H. Michner; 10. Welch, E. L. De Camp; 11. Haynes, C. B. Warren; 12. Pope-Hartford, Phil Haines; 14. Berlet, P. J. Johnson; 15. Pope-Toledo, Joe Judge; 16. Stearns, W. I. Flickling; 17. Premier, C. C. Singer; 18. Glde, J. C. McCafferty; 19. Franklin, R. G. Howell; 20. Pierce, J. S. Williams; 21. White, R. B. Mann; 22. Aerocar, A. M. Robbins; 23. Maxwell, Chas. Fleming; 24. Corbin, John Dower; 25. Mitchell, E. W. Hudson; 26. Stoddard-Dayton, R. Newton; 27. Dragon, A. L. Kull; 28. Darracq, S. B. Stevens, Jr.; 29. Corbin, Jim Corbett; 30. Reo, B. L. Luckwood.

BAKER ELECTRIC PASSES CENTURY MARK.

CLEVELAND, O., June 3.—The Baker Motor Vehicle Company has never made any very great claims for high mileage radius of its electric vehicles, but last week, to satisfy a doubter, the Price Brothers' Carriage Company, Cleveland agents for the Baker, made a test run with a standard Baker victoria fitted with a standard Exide 9 m.v. 24-cell stock battery, a car which had been in continuous service for four months without attention, and covered 101.6 miles with one charge. Much of the run was over unpaved streets and a number of grades were encountered.

DETROIT'S AUTO PLANTS ARE STILL BUSY.

DETROIT, MICH., June 3.—The lassitude usually making its appearance at this season of the year in the automobile industry, and which increases as the summer months advance, is little in evidence among Detroit plants. On the contrary, unwonted activity is to be found in a majority of instances. Several reasons may be given for this condition of affairs. That there will be more cars than ever before marketed in a single season has been determined beyond a question of doubt. At the same time, the backward spring has held up shipments to an appreciable degree, the man who contemplates purchasing a car preferring to wait until the weather offers some inducements to motorists.

Nor has this proved an unmixed blessing. Far-sighted manufacturers were quick to note the changed conditions, and governed their course accordingly. Heretofore a majority of the local plants have been forced to run nights for a portion of the time to meet the rush. This season there has been little or none of this overtime work, the even trend of affairs permitting that attention to every detail that is so essential in the production of a high-grade automobile. The additional expense incurred in working longer hours has been eliminated, the factories have operated steadily to date, with the prospects encouraging for a continuation of activities taking the place of the customary spasmodic spurts, followed by a dull period, and from every standpoint the situation is regarded as much more encouraging than was the case even a few weeks earlier.

RUSHMORE TO HAVE UNIQUE POWER PLANT.

After having constantly extended its old plant until there was no ground left to expand further, the Rushmore Dynamo Works has found it necessary to have still more room and have broken ground for new buildings, the main one of which will be 250 by 50 feet, two stories high. Though the addition is to be of the most advanced type of modern factory construction, interest centers in the new power plant. It is a type more or less well known in Europe, but this is to be the first of its kind here, at least in connection with the automobile accessory business, and the town of Plainfield, N. J., where the plant is situated, will take on new interest by reason of its location there.

The power house, which will be a separate building, measuring 50 by 50 feet, will contain a 200-horsepower, twin-cylinder horizontal Koerting gas engine, direct-connected to a large generator, the drive throughout being electric on the group system, except in the case of heavy units, which will be direct-driven by electric motors. The engine and generator unit will weigh in the neighborhood of 80,000 pounds, and there will be a similar 75-horsepower unit for use in emergencies and to take care of occasional overloads, the plans including provision for a duplicate of the large unit in the future. A ten-ton electric crane will span the engine room and will facilitate the installation of the machinery as well as its handling when repairs are needed.

Gas will be supplied by two anthracite producers, one of 250 horsepower and the other of 75 horsepower, the gas also being used for heating the furnaces of various kinds used in the plant, while the buildings will be warmed by a forced hot-water circulation of the cooling water from the engine jackets. The temperature of this water will be raised considerably by being passed through a special form of boiler utilizing the hot exhaust gases direct from the engine. There will also be a complete brass foundry, measuring 50 by 50 feet, and as it is the intention to run both the old and the new plants at full blast, they will be connected by a light gauge railway running through all the departments.

The new power plant is calculated to effect an economy of three-fourths the coal ordinarily required to run the same amount of machinery, and as lens grinding calls for a great deal of power, there will be a great reduction in the cost of manufacture. The complete factory will represent an investment of \$100,000 and will be the most elaborate of its kind in the world.

BRIEF ITEMS OF NEWS AND TRADE MISCELLANY

Mrs. H. A. Lozier will drive her Lozier car in the Orphans Day parade, to be given under the auspices of the New York Motor Club, June 12.

The Tuxedo (N. Y.) Park Association is now running a line of auto 'buses from its clubhouse to the railway station. Seven cars are in service. Charles Allen, formerly with the Maxwell-Briscoe Company, has charge of the cars and the garage.

A 40-50-horsepower six-cylinder Rolls-Royce car is to take part in this year's A. A. tour for the Glidden cup, one of these cars having been ordered from the Rolls-Royce Import Company, of New York, by a customer, expressly for this purpose.—*The Automotor Journal* (Eng.)

French papers received state that all the winners in the Targa-Florio Cup race abroad, which included the Fiat, Itala and DeDietrich, were equipped with Truffault-Hartford shock absorbers, which are now included as regular equipment on seventeen different makes of cars sold in this country.

York (Pa.) automobilists are interested in a novel event which is now well underway for a twenty-four-hour non-stop contest which is to be held during the latter part of July. James A. Kline, general manager of the York Motor Car Company, manufacturers of the Pullman automobiles, is one of the originators of the run, and plans are now being completed.

A line of coupés, especially for the use of physicians, is nearing completion in the Winton factory at Cleveland. The body is modeled after the coupé that Mr. Winton has had in his personal service for more than a year. The body encloses the steering wheel, the dash and its equipment and the seats, affording the fullest protection from the weather to driver and passenger.

An interesting test of carrying thirteen passengers up Corey hill, Boston, was made in a 20-horsepower Maxwell touring car, May 11, and gave to the Ajax tires, with which the car was equipped, a pretty tough proposition to handle, from which they emerged with flying colors. The tires were 30x3 I-2, and the whole outfit weighed over two tons. The distance was 500 yards, on a grade varying from 12 to 18 per cent.

May was another record-breaking month for the registration of automobiles at Albany, there being 2,209 registered during that period. Of this number, 172 were imported cars. The leader in registrations was Ford, there being almost twice as many of that make registered as any other. The total of Fords were 222. Next in order comes the Cadillac, with 143, and close to it the Maxwell with 140 registrations.

The new form B odometer of the Veeder Manufacturing Company is not equipped with trip indicator, as would be inferred from a perusal of a notice concerning same that appeared in our issue of May 16, page 841. Its new feature is a simplified universal attaching fixture, so made that any owner can readily adjust the fittings to his own car. Veeder instruments show total mileage up to 10,000 miles, and some models also show the separate distance of each

trip, the trip figures being reset to zero before the start without disturbing the totals.

The White Company has just issued the third of its series of route books, which are for free distribution to all tourists. This new issue is devoted to the main touring route between New York and Boston. Complete and accurate road directions are given for traveling over this important route in either direction. The route directions are copiously illustrated, and, in addition, there is a fine double-page map. Copies of White Route Book No. 3, and of the two previous issues, may be obtained on application to The White Company, Cleveland, Ohio, or to any of its branches or agencies.

Ohio's town, "where the rubber tires come from," which everyone knows means Akron, is as progressive as its tire makers, for it has had an automobile patrol wagon for the past eight years. The latter was a pioneer in this field, as it was the first of its kind in the country. Now it is about to be supplanted by something more modern in the shape of a Reo 16-horsepower gasoline car. The order was awarded to the Reo Motor Car Company, of Lansing, Mich., through their local agent, M. S. Long, at Akron, and the chassis is being built according to specification. The body will be that ordinarily employed on the Reo 'buses and will have a seating capacity of ten people.

The Salisbury Wheel & Manufacturing Company of Jamestown, N. Y., has issued invitations for its second annual house party and outing, which will be held in the Lakewood Country Club at Lakewood, on Chautauqua lake, during the week of June 29-July 6. The invitations have been sent to the patrons of the company and to automobile manufacturers and others interested in the business. The members of the "Steering" Committee are Clare A. Pickard, Scott H. Penfield, Erwin D. Shearman and Fletcher Goodwill, all good entertainers. The program will include fishing, boating, motoring, steamboat trips and the Country Club golf links will also be at the disposal of the guests during their stay.

In the description of the Auto-Light which appeared in THE AUTOMOBILE of May 2, it was erroneously stated that this device, which is a clever and simple arrangement for lighting the lamps from the seat, was used in connection with the ignition system of the car. The makers state that this is not the case, as two years' experience in so using it has demonstrated beyond any question that such interconnection does not give satisfactory service, one of the reasons being that the average autoist is prone to blame the Auto-Light for trouble arising in the ignition system, even where nothing more serious than a sooted plug is at fault. Consequently, they have made the device entirely self-contained; it consists of the sparking attachment for the burners, a small dashboard coil with an ingenious switch, and the necessary primary and secondary connections. To light the lamps, the gas is turned on and the switch moved first to one point and then the other, an automatic attachment preventing a short circuit in case the driver should omit to

open the switch after both lamps are lighted, so that there is no danger of ruining the batteries by permitting the sparking to continue at the points when the operation of lighting is completed.

Headed by Pierce Schenck, of the Dayton Malleable Iron Company, of Dayton, O., a company has been recently organized to give Dayton its second automobile manufacturing plant. Mr. Schenck is one of Dayton's pioneer autoists, and is considered quite an authority on automobile construction. The new company has acquired four acres of land, together with the factory of the Dayton Machine Tool Company, at Edgemont, and will devote its attention to the manufacture of both six and four-cylinder cars, but particularly the former. The Rutenber motor will be used. The title of the new concern is to be the Speedwell Motor Car Company, which was incorporated last week with a capital of \$50,000, the organizers being Pierce Schenck, H. C. Barnes, J. A. McMahon, J. Sprigg McMahon and B. B. Etter, all of Dayton. It is intended to only turn out a few cars this season, but preparations will be made for a large business for next year.

RECENT TRADE REMOVALS.

The Boston Gear Works has removed to its new and commodious factory at Norfolk Downs, a few miles south of the Boston city limits, where ample facilities for its largely increased business are to be had. The Boston office and storage facilities at 102 High street, corner Congress street, are retained.

The C. G. V. Import Company is now permanently located in its new building, 1849 Broadway, at Sixty-first street, New York City, where ample space permits a fine display of cars. The garage and storage facilities enable the company to import C. G. V. cars in such numbers that immediate deliveries can be made customers. A reception room for customers adjoins the offices on the second floor.

NEW AGENCIES ESTABLISHED.

The Capitol Hill Garage, 615 B street, Southeast, Washington, D. C., operated by James J. Flynn, has been appointed agent for the Rambler and Mitchell cars in that city.

H. T. Cruger has been appointed agent for the Ford at Waco, Texas. He is located at 615-17 Franklin street, having purchased the plant and salesrooms of the Banning Machinery Company, which he succeeds.

The J. Stevens Arms & Tool Company, of Chicopee Falls, Mass., will open a branch store in Boston for the sale of Stevens-Duryeas next season. This car has been represented at the Hub in the past by the late F. E. Randall.

Among the new agencies recently established by the Rainier Company is one for the State of Texas, in charge of H. H. Lewis, Jr., who will be located in Fort Worth and who will be the first agent to take on the Rainier cars in this territory.

The Wayne Motor Company is the style of the new concern which will handle the Wayne cars for Chicago and

vicinity. The company is composed of Chicago men, and Otis Friend, formerly with the Chicago Mitchell agency, has been appointed manager. Space has been leased from the Branstetter Motor Company, at 1337 Michigan avenue, where headquarters will be made. Jesse Draper, sales manager of the Wayne Automobile Company, of Detroit, recently completed final arrangements for the transfer of the agency from the W. W. Shaw Company to the new concern.

PERSONAL TRADE MENTION.

J. N. Merwin, sales manager for the Forest City Motor Company, Massillon, O., is visiting the eastern agents of the Jewel car.

R. B. Jacobs is to manage the automobile and accessories show which will be held at Foot Guard Armory, Hartford, Conn., March 23-28, 1908.

Chester E. Clemens, formerly connected with the Napier Motor Company of Boston, as designer and engineer, is now with the automobile department of the St. Louis Car Company, St. Louis, Mo.

Walter Clapp, Jr., formerly connected with the Boston Rambler branch, has accepted the position of manager of the Hartford Rubber Works Company's branch at Buffalo, entering upon his duties June 1.

S. H. Baker, who has been manager of the F. E. Randall estate, which represents the Stevens-Duryea in Boston, has resigned his position to enter the local trade as agent for a line of cars, as soon as he can conclude arrangements.

George H. Strout, of the sales department of the Electric Vehicle Company, of Hartford, Conn., is making a trip among the Columbia dealers in southern territory. He reports trade conditions in the cities he has so far visited as particularly encouraging.

Chas. G. Percival, for the past three years with the Linscott Motor Company, of Boston, has resigned and will enter the local trade in that city with an agency for one of the leading Western cars, the details of which will be announced later.

Mark C. O'Connor has been appointed purchasing agent for the Forest City Motor Company, Massillon, O. He was for several years with the purchasing department of the Waverley department of the Pope Motor Car Company, Indianapolis, and later with the Marion Motor Car Company, of that city.

C. S. Pelton, who has been with the B. F. Goodrich Company for the past five years—three at the factory and two at Pittsburg, Pa.—has been appointed manager of the Buffalo branch of the Pennsylvania Rubber Company. Fred Roblin, who has had charge of the Buffalo branch temporarily, will return to the tire department of the Pennsylvania company's plant, at Jeanette, Pa.

Charles Bates, for several years manager of the Frederick E. Randall estate agency of the Stevens-Duryea cars in Boston, who left that position last year to become superintendent of the Bay State Automobile Company, makers of the Bay State Forty, has just rejoined his old connections. Mr. Bates is an Englishman, and has long been identified with the automobile industry on both sides of the Atlantic, having been associated with the English Daimler Company before coming to Boston.

TWO NEW MOSLER PLUGS.

The makers of the "Spitfire" plugs, A. R. Mosler & Co., 163 West Twenty-ninth street, New York, announce that they are now manufacturing a line of plugs patterned after the recently adopted standard of the Association of Licensed Automobile Manufacturers. This is a 7-8 inch plug with 18 threads to the inch. They are also introducing two new plugs, to be known as the Mosler Triumph and the "Beat-M-All." Both are of the open-end type, with deep recesses, and have the same effective porcelain insulation as the Spitfire. Some idea of the extent to which the Mosler factory is being pushed is shown by its single order for 300 ounces of platinum.

THE "COLBURN SKYSCRAPER."

It was not so very long since that Colorado was not considered a particularly good place for automobiles, much less for manufacturing them, but conditions have changed and probably the State can now boast as many cars in proportion to its population as any other. This year she is going to turn out some of her own cars. The Colburn Automobile Company, of Denver, is to be the sponsor and the production is to be known as the Colburn Skyscraper. Unlike many of the projects that come out of the West, this is not of the usual gigantic proportions. The new company is modest—it is only going to set out to build fifty cars this year—but it is going to build them well. Next year it will do better on numbers.

The car is to be a four-cylinder 25-horsepower vehicle with a sliding-gear transmission, using the selective type of operation, and having four forward speeds, with the direct drive on the third. The motor is to have all the valves in the head operated by a single super-imposed camshaft; a duplicate system of ignition will be employed, using a high-tension magneto and accumulators.

The clutch will be of the conical type, with cork inserts, and the final drive will be by double side chain. Timken roller bearings will be employed on the running gear and D. W. F. ball bearings in the change-speed gearbox, the latter having chrome nickel-steel gears. With full equipment, including top, the car will list at \$3,250.

NEW TRADE PUBLICATIONS.

An illustrated catalogue from the American Motor Company, Brockton, Mass., presents a complete description of the Marsh-Metz motorcycle and its use as a tricar for pleasure or delivery purposes.

A terse talk on electric automobiles to those who know or want to know is the subject matter of a booklet published by Oliver P. Fritchle, under the title "What I Am Doing and Why." The publication, which deals with Fritchle electric vehicles, can be obtained from the firm's headquarters at 1449-1455 Clarkson street, Denver, Col.

In connection with the Jamestown Aeronautical Congress a handbook has been produced by the Department of Congress and Special Events, with offices at 12 East Forty-second street, New York, dealing generally with the aero section of the Jamestown exhibition. In addition it gives a complete list of officers, a list of the ascensions made in the United States by members of the Aero Club, a list of aeronautical prizes, etc.

From the Coppock Motor Car Company has been sent forth an illustrated catalogue of the Coppock model A one-ton truck driven by a three-port two-cycle gasoline motor. The application of the two-cycle to commercial vehicles offers a considerable amount of interest, and the booklet should be in demand among present or prospective users of automobiles for commercial purposes. It can be obtained from the company's headquarters at Marion, Ind.

The two-engine automobile manufactured by the Carter Motor Car Company, Detroit, Mich., has as its distinctive feature two independent gasoline engines, each having either two, four, or six cylinders, and each one capable of being used independently or together. There being always a complete power plant in reserve, the danger of being stalled on the road is entirely removed. Full particulars of the machine are to be found in the booklet just published under the title "Carter Two-Engine Automobile."

It is an interesting, racy monologue that is presented between the covers of the little brochure issued by the American Motor Car Company, with the title "Two in a Roadster." The writer has dropped the usual shriek of the advertising man, and tells his little story in a manner interesting to all, while the excellent vignettes on every page carry you along with him and give an additional interest to the narrative. Finally, if you are so disposed, you can study the make-up of the car around which the writer has spun his romance, in three or four pages at the end of the booklet.

"A Treatise on Marine Gasoline Engines" is more than an ordinary trade catalogue, for it comprises a lengthy description of the marine engine in general and the Ferro marine engine in particular. Of more than sixty large illustrated pages, it describes every part of the marine gas engine in detail and shows several of the processes of production. The book should be received with interest by all motor boat men. A smaller publication also from the Ferro Machine & Foundry Company, of Cleveland, gives detailed instructions for the care and working of Ferro marine engines. It is a practical, useful publication. These two books will be sent postpaid to any address upon receipt of ten cents.

"A Study in Graphite" is the title of a recent booklet published by the Joseph Dixon Crucible Company and one that will make special appeal to the inquiring mind. It gives in detail a series of tests of graphite made by Professor W. F. M. Goss, of Purdue University. These tests were not made with a view to finding points for or against graphite, but were conducted in the spirit of scientific research. The study opens with a dissertation by Prof. Goss based upon the conclusions drawn from the results of the tests. Then follow complete descriptions of the tests together with illustrations of the testing machine made from photographs and drawings. The condition of the bearings and journal is shown by photographs taken at different stages. A limited number of copies will be distributed free of charge to all those interested in the science of graphite lubrication. Address the Joseph Dixon Crucible Company, Jersey City, N. J.

INFORMATION FOR AUTO USERS.

Syracuse Storage Battery.—This storage battery, guaranteed for one year by the Syracuse Auto Supply Company, 118-120 State street, Syracuse, N. Y., is built upon standard accepted principles and em-



THE SYRACUSE STORAGE BATTERY.

bodies all the necessary requirements to make a light-weight, powerful and durable battery. The pasted type of plate, employing the reinforced staggard grid, is used. The active material is specially prepared to produce the highest capacity per pound weight. The cells are encased in a compact quartered oak box with hard rubber top and heavy nicked handles and guards.

An Automobile Tire Protector.—Manufactured by the Perfect Tire Company, Rock Rapids, Iowa, the cover here illustrated consists of steel plates two inches

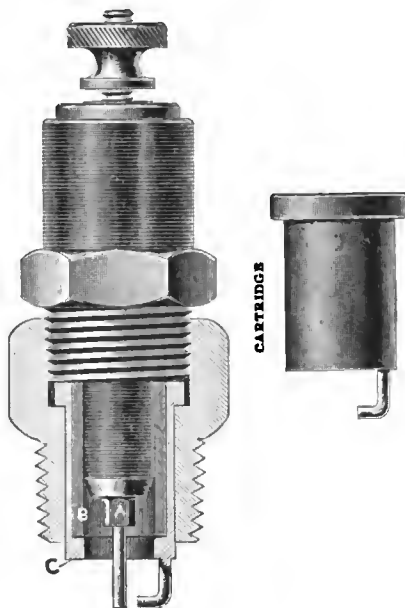


"PERFECT" TIRE PROTECTOR.

wide, oveled so as to fit the tread of the tire, and lined with a belting which holds them together and comes in contact with the tire. The plates are wide enough to

protrude slightly over the width of the tread, the chains holding the plates to the tread barely touching the sides of the tire. These chains are held to the wheel by a band ring with turn buckles, so that it can be loosened or tightened at will. The cover can be taken off or put on in 15 minutes.

A Renewable-point Spark Plug.—The feature of the Wiley spark plug, manufactured by the Hub Lubricator Company, 78 Portland street, Boston, Mass., is that the point can be renewed by replacing the cartridge C by a new one, and by changing the point A. The plug is made of best selected mica, double insulated, and will

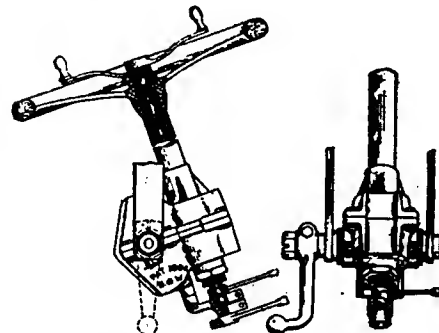


WILEY SPARK PLUG IN SECTION.

not short circuit. It is claimed that with this form of construction the Wiley is equivalent to two plugs and therefore an economical commodity that will commend itself to auto users.

Safety Steering Device.—After three years experience on high-grade cars, the Boston Gear Works of Norfolk Downs, Wollaston, Mass., offers a safety steering device of the worm-gear type. The worm is made of machinery steel, and the sector is of best quality drop forged steel, both case-hardened 1-32 inch. The casings enclosing the working parts are cast in two pieces, an upper and a lower, bolted together. They can be either cast-iron or a special hardened aluminum. Bearings are long and are made of bronze. When parts are screwed together large diameters and fine threads are used, making a strong and reliable connection. The sector shaft is of steel, and, if desired, can be made in one piece with crank. The bushings in which the sector shaft runs are eccentric.

allowing the taking up of any wear which may occur. The other adjustment, that of end play in the steering post, is also taken up by a nut on the bottom end of the steering post. The hanging of this device is a rather unique arrangement, the



WORM-GEAR SAFETY STEERING DEVICE.

sector shaft being made long and steel straps with bronze bushings holding the device in place. These supports can be made any length to suit conditions of car. By this method the device may be hung so as to give either a fore and aft or side motion of the crank.

Annable Pneumatic Auto-Spring.—Claims made for the Annable pneumatic auto-spring, manufactured by the Annable Pneumatic Spring Company, at Detroit, Mich., are that it will carry a car of any weight with as big a load as can be put into it on 13 pounds pressure to the square inch, compared with 70 pounds pressure for a pneumatic tire. The machine is suspended on air under slight pressure confined in cushions placed between the car body and the running gear. The four cushions are united by air tubes which admit of free play between each unit, and these are all connected to an air reservoir containing the same cubical volume of air and the same initial pressure as the cushions and tubes. Opening into this reservoir is a specially devised valve and a by-pass. When the cushions are violently depressed they are relieved of excess pressure by the air instantly passing into the reservoir through the valve, immediately afterwards returning to the tubes and cushions through the by-pass, but with graduated force.

Briscoe Radiator Reasons.—"Because on every order of any size we make duplicate working patterns and keep one set in each plant as insurance against fire, strike or breakdown; because we have our own brass foundry, our own machine shop; make our own tools, dies, tubes, etc.; because we have two plants, one east, one west, with duplicate equipment," and last but not least, "because we have studied radiators scientifically, experimentally and practically for the past seven years," are some of the reasons given by the Briscoe Mfg. Co., of Detroit, Mich.; and Newark, N. J., on their new mailing card just issued.

INDEX TO ADVERTISERS

Table listing various companies and their page numbers, including Ajax-Grieb Rubber Co., Acetylene Gas Illuminating Co., Acme Motor Car Co., American Ball Bearing Co., American Locomotive Motor Car Co., American Motor Car Co., American Motor Truck Co., American Vanadium Co., Anderson Forge & Machine Co., Applance Mfg. Co., Arc Toledo Spark Plug Co., Ashtabula Carriage Bow Co., Ashton Valve Co., Aster Co., L., Atlas Mfg. Co., Atlas Motor Car Co., Auburn Automobile Co., Austin Automobile Co., Auto and Power Appliance Co., Auto Goods Co., Auto Pump Co., Autocar Co., Automobile Supply Co., Avery Portable Lighting Co., Badger Brass Mfg. Co., Baird-Banks Mfg. Co., Baker Motor Vehicle Co., Baldwin Chain Mfg. Co., Barnes Mfg. Co., Barrett Mfg. Co., Bay State Auto Co., Bay State Goggles Co., and Beaver Mfg. Co.

THE AUTOMOBILE



LOZIER WHICH GETS THE CUP IS TO BE SEEN IN THE FOREGROUND.

THERE were no ties in the 208-mile endurance run of the New York Motor Club. Judging from similar events which I have seen in France and Britain, this one-day contest from New York City to Albany via the Berkshires was the most strenuous thing of the kind that has been asked of the automobile since it appeared on the scene. The route embraced roads of all degrees, excellent, good, indifferent, and wholly bad; level stretches, and hills to climb and hills to descend, and, for a good share of Thursday, June 6, the rain descended upon the just and the unjust and the automobilists.

At the conclusion of the long, hard day, the one which survived with less points charged against it was a sturdy four-cylinder air-cooled Corbin, driven by John Dower; but, alas for its claim on the touring car class cup, it had come the latter part of the journey with one passenger less than the rules called for. Therefore, it was the ponderous Lozier, with H. Michener, at the wheel, which profited by the non-observance of the conditions.

In the runabout division the most consistent performer turned up in the Haynes, guided by C. B. Warren, and next best was Richard Newton's Stoddard-Dayton.

Considering the roads and the weather, and the extraordinary conditions that ex-

isted, the score of the day reflected to the rare ability of the automobiles participating, for 13 of 17 touring cars and 4 of 10 runabouts completed the trying trip; not to forget a half-dozen free lance official and press cars which reached the Ten Eyck in Albany before midnight.

Twenty-seven candidates in all responded for the fray and reported to Chairman R. H. Johnston—who deserves great credit for his masterly handling of the affair—and at 6 o'clock from the corner of Broadway and Sixty-second street the first car, a Frayer-Miller, took the word from Starter Wagner and Timer Dieges. A minute apart they were sent away, and in their wake followed the Berliet press car, of which I was one of the six occupants.

We thought we were law-abiding, but just as we tried to leave the outskirts of Yonkers there flashed past us on the deserted roadway—unoccupied except by ourselves—a “bike cop,” who haled us back to a station-house a mile or more away. Ser-

geant Cooley was gruff but sensible, and over the telephone Judge Beale recognized the technical character of the arrest. But when we took to the road again we were hopelessly in the rear and remained so nearly all day.

For twenty miles there was nothing, except the two official flags, to indicate an endurance test. The roads were muddy—



CORBIN "NO. 24," WHICH WON YET LOST THROUGH NOT RETAINING FOUR PASSENGERS.



EVERY CAR REPORTED AT THE TARRYTOWN CONTROL.



ROBBINS AND AEROCAR WHICH REACHED SIX CONTROLS ON TIME



TIRE TROUBLES NUMEROUS BECAUSE OF ROAD CONDITIONS.



WELCH, HAYNES, AND POPE-HARTFORD AT COLD SPRING, N. Y.

but they are often muddy in the neighborhood of Paris—and would surely improve when the vehicular traffic of the great city had been thoroughly shaken off.

Tarrytown hove in sight, there was a passing word with the checker, and the Berliet continued its regular easy, forward march through mud and rain.

Cold Spring, the second checking station, failed to bring any sight of the contestants, and it was somewhere in the neighborhood of Poughkeepsie that the rear guard was first overhauled. Continental was having trouble with tires, Frayer-Miller had a similar malady, and Dragon, Stearns, and Franklin were observed in difficulties of a like nature.

At Poughkeepsie, where, being non-contestants, it was possible to spend a few minutes to supplement the morning sandwich with more substantial refreshment, news was available of the group ahead of us. Maxwell had retired to the hotel garage to repair a cracked frame, and sent out a bulletin that she would soon be strengthened up and on the road again. Glide had slipped out for some unknown reason. Franklin was working furiously on tires—detachables, fortunately. Dragon, Stearns, and Continental came and left while we were waiting.

Outside Poughkeepsie there is a highway—highway is employed euphonistically—that no adjective in Webster's dictionary adequately describes. Had it not been so wet it might have been described as a plowed field; the only comparison which could be brought to mind was an oozy harbor, in a small town of boyish memories, which ran dry at low tides. The harbor bed, however, had a comparatively smooth surface; the Poughkeepsie road, on the other hand, was furrowed in a thousand lines, which held the wheels in a firm grip and prevented any deviation for the greasy path of rectitude. Fifteen yards ahead was the Continental, with a pressman-observer occasionally on its rumble seat. From left to right, and from right to left, the five in the tonneau of the Berliet bumped and jostled one another, soared upwards from one to twelve inches, and came down with pains varying from the minute to the acute. Not even the satisfaction of a unique experience was ours, for if some day in the chauffeurs' cafés on the Avenue de la Grande-Armée we dare to relate that a bunch of American machines traveled at over twenty miles an hour over roads compared with which the artillery drill ground in winter is a boulevard, we should be unceremoniously hooted out.

Little by little the belief that the Motor Club Committee had chosen a few of the least traveled tracks of the country as a special test of the machines began to slide away. They might have chosen fifteen or twenty miles of rocky riding; they might even have found thirty miles of it, but to believe that they would deliberately select the whole course over by-paths was impossible to believe. These must be the American roads we often read about in European journals, and around which returned travelers delighted to weave fancy flights of the imagination—invariably received with the remark *blague* and *bluff américain*.

At Great Barrington, 134 of the 200 odd miles, Pope-Toledo, Glide and Maxwell were the only three having disappeared from the mad mud run. Welch, Haynes, Aerocar, Corbin and Reo had perfect scores, at any rate so far as time on schedule was concerned. An average of about twenty miles an hour on such road conditions, where the engine plowed the machine through the most persistent mud it is possible to imagine, and where speed had to be kept very low in the occasional spots where speed was possible, owing to the operation of traps, is a performance of more than ordinary worth.

After lunch a readjustment of weight was made, the writer being transferred from Berliet press car to Berliet patrol car, the driver of which latter had no intention of remaining long in the rear. At the risk of being considered a dissatisfied grunter, one more mention must be made of the lack of roads. It was outside Lenox, splendid country, magnificent residences, every indication of material comfort, but between the two widely separated hedges a miry, slimy mass of the consistency of carpen-

ters' glue, rather more liquid and a little darker in color than the mother earth in the adjoining fields. On low gear and with wide open throttle the Berliet plunged into it as she had been doing for the previous six or seven hours. The running boards were under, the gasoline tank was reposing on the soft, greasy bed, half the radiator was choked with mud, the rear wheels spun round, and the car remained as immovable as a rock. Only when all passengers had been disembarked and the engine raced until its water was boiling could traction be obtained. When the spot was passed somebody discovered that the confetti car had passed over the footpath.

There was another similar experience after some delightful scenery in the Berkshires, when the Berliet struck a short, stiff grade with bottomless mud, a few miles from Chatham. Again she was lightened, this time of only half her crew, given a supply of water inside and outside the radiator, and rushed to the top. On the good portions—the good portions in this case being the stretches of road with an under surface covered with an average of not more than four inches of mud—there was exciting going. With a splash the front wheels would strike a muddy lake, throwing the brown fluid right and left with much the same effect as a motor boat taking a sea at high speed. Despite the wind shield, much of it came inboard, completely disguising the more exposed occupants at the end of a few miles. When one car passed another, a rather rare occurrence, the crew of the slower machine had to duck to avoid a shower.

Grade Crossings Caused Anxiety Throughout.

Few stops were observable for mechanical troubles. Tire annoyances were plentiful. Early in the day the Frayer-Miller was begging inner tubes from passers-by, the Franklin filled its tires with punctured tubes instead of air, and quite a number reported their fifth or sixth blow-out. Our own came soon after Valatie, while running for Albany in the dark. Almost at the same spot lay Franklin, abandoned, with rear axle disabled as result of running on flat tires. Further ahead lay the remains of the Corbin No. 2, whose sad accident was the only blot on an otherwise perfect tour. An entirely unprotected crossing—the Railroad Commissioners say it is one of the worst in New York State—the only wonder is that accidents of this nature are not more frequent; until the railroad companies are under the same obligations as other users of the highways, it is to be feared that other occurrences of this nature will have to be recorded. It was saddening news to learn of the death of poor Clarence McKenzie, a fatality that came so close to the end of the hard run.

Limping on three tires, the punctured pneumatic having come off en route, the Berliet checked in at Hotel Ten Eyck at a late hour. There was not a clean score, nor a clean traveler, among the 27 starters, but there were numerous exhibitions of mechanical endurance and human dash and skill of the superlative degree.

Summarized, the result of the New York Motor Club's 200-mile, one-day run is to be found in the table below. Controls were at Tarrytown (23 miles), Cold Spring (52), Poughkeepsie (75), Amenia (102), Great Barrington (134), Pittsfield (155), Chatham (183), and Albany (208).

For checking purposes each section of the route was considered independently, whatever their position, all cars starting out from controls free of penalty for that section. One point per minute for late arrival at controls, and two points a minute for repairs and adjustments, or early arrival, constituted the penalty list. Class A comprised full touring cars with not less than four passengers, and Class B included runabouts with either two or three passengers.

THE OFFICIAL REPORT OF THE COMMITTEE.

The Endurance Run Committee consisted of R. H. Johnston, chairman; S. B. Stevens, Jr., A. G. Batchelder, Alfred Reeves.



HAYNES, WINNER OF RUNABOUT CLASS, ON ARRIVAL IN ALBANY.



WHITE TACKLES A BERKSHIRE ROAD IN PROCESS OF REPAIR.



LAKEVILLE, CONN., WAS HAZY IN THE FALLING RAIN.



OFTEN ROADS WERE GREASY AND SKIDDING UNPOPULAR.



BERLIET "PRESS" CAR CAPTURED BY A YONKERS "COP."

"The award of the prize in the touring car class is made to No. 9 Lozier. The award of the prize in the runabout class is made to No. 11 Haynes.

"The observers' cards show that no adjustments, repairs or replacements were made to the following cars:

"No. 1 Frayer-Miller, No. 8 Continental, No. 9 Lozier, No. 11 Haynes, No. 12 Pope-Hartford, No. 14 Berliet, No. 24 Corbin and No. 26 Stoddard-Dayton.

"The remaining cars which finished received only minor penalties, which, it is reasonable to assume, might not have been necessary under normal touring conditions."

HERKOMER WON BY LADENBURG OF MUNICH.

FRANKFORT, GERMANY, June 11.—This year's Herkomer Tour, which has been on since June 5, was completed to-day, a Munich entrant by the name of Ladenburg being declared the winner. Out of the 161 starters, no less than 110 went the entire distance in good shape. The start was from Dresden around an 1,800-kilometer circuit, with the finish at Frankfort, and the event was purely an endurance run.

TABLE SHOWING ARRIVALS AT ALL CONTROLS AND OFFICIAL POSITIONS. — A. TOURING CAR CLASS.

No.	Car	Driver	Entrant	Tarry-town	Cold Spring	Pough-keepsie	Amenia	Gt. Bar-ington	Pitts-field	Chat-ham	Albany	Total
24	Corbin	John Dower	Corbin M. V. Co.	0	0	0	0	5	0	4	0	9
9	Lozier	H. Michener	H. A. Lozier	0	0	0	0	4	0	1	13	18
10	Weich	E. L. De Camp	L. H. Perlman	0	0	0	0	0	4	15	5	24
30	Reo	B. L. Lockwood	R. M. Owen & Co.	0	0	0	0	0	0	17	29	46
14	Berliet	P. J. Johnson	A. Locomotive Co.	0	2	0	0	0	21	19	37	79
25	Mitchell	E. W. Hudson	Mitchell Motor Co.	0	0	10	10	8	2	38	35	103
29	Corbin	Jim Corbett	Corbin M. V. Co.	0	0	0	8	10	4	45	49	116
12	Pope-Hartford	Phil Hines	A. G. Southworth Co.	0	0	0	33	0	0	12	86	131
28	Darracq	S. H. Shaw	S. B. Stevens	0	12	2	34	12	8	40	42	150
27	Dragon	A. L. Kull	A. L. Kull Auto Co.	0	0	50	0	0	19	30	20	153
5	Knox	H. M. Davis	Knox Auto Co.	0	0	0	8	0	19	58	137	222
21	White	R. B. Mann	White Steamer Co.	0	0	0	0	99	10	57	63	229
1	Frayer-Miller	H. H. Knepper	H. H. Knepper	0	0	1	108	59	6*	24	102	300
15	Pope-Toledo	Joe Judge	A. G. Southworth Co.	0	0	0	0	Out				
18	Gilde	J. C. McCafferty	Geo. J. Scott Co.	0	0	Out						
22	Aerocar	A. M. Robbins	A. M. Robbins	0	0	0	0	0	0	34	Out	
23	Maxwell	Chas. Flemming	Maxwell-Briscoe Co.	0	5	24	Out					

*Arrived ahead of time.

TABLE SHOWING ARRIVALS AT ALL CONTROLS AND OFFICIAL POSITIONS. — B. RUNABOUT CLASS.

No.	Car	Driver	Entrant	Tarry-town	Cold Spring	Pough-keepsie	Amenia	Gt. Bar-ington	Pitts-field	Chat-ham	Albany	Total
11	Haynes	C. B. Warren	C. B. Warren	0	0	0	0	0	0	18	1	20
26	Stoddard-Dayton	R. Newton	Atlantic Motor Co.	0	0	4	0	0	2	26	18	50
17	Premier	C. C. Singer	R. M. Owen & Co.	0	0	8	24	0	20*	0	54	106
8	Continental	C. S. Johnston	C. S. Johnston	0	0	83	0	16*	10	44	37	182
16	Stearns	W. I. Fickling	W. I. Fickling	0	0	46	0	40*	34*	31	56	106
3	Dragon	John Haynes	John Haynes	0	0	0	22	46	49	Out		
4	Stoddard-Dayton	Ray Howard	B. F. Dawson	0	0	0	24	5	Out			
6	Mora	F. Cimlotti	Cimlotti Brothers	0	0	6	11	19	Out			
19	Franklin	R. G. Howell	Wyckoff, Church & P.	0	5	9	49	18	0	14	Out	
2	Corbin	James Swan	Corbin M. V. Co.	0	0	0	0	0	0	16	Out	

*Arrived ahead of time.

and W. J. Morgan. Monday night it completed the report of the run, and the following is included:

"In reference to the protest filed by the Welch Motor Car Company against Corbin No. 24, the committee find that the Corbin carried but three passengers from Great Barrington to Albany. The committee realize that there were extenuating circumstances in reference to the dropping of the original passengers and to proceeding thereafter with but three. Nevertheless, despite the fact that the Corbin finished with the least penalization, the committee have no other alternative than to declare it ineligible for the first prize. The protest entered by the Welch Motor Car Company against No. 9 Lozier has been withdrawn.

"The committee has also seen in the newspapers what purports to be a protest from A. G. Southworth. As no such communication, with the requisite fee of \$10, has been received by the committee, it would not have been necessary to take any cognizance of same, except that it implies that the committee was not fair to No. 12 Pope-Hartford. In answer to this allegation it is only necessary to point out that had the car in question adhered to its schedule it would have been due at Albany at 6:11. As a matter of fact, it did not arrive until 8:22, which obviously and unquestionably entailed a penalty of 131 points, as the most superficial examination of the rules would show.



GRADE CROSSINGS ARE A MENACE TO AUTOMOBILES.

WEATHER SPOILS BRITISH TOURIST TROPHY RACE

By JOSEPH F. MACKLE.

DOUGLAS, ISLE OF MAN, May 31.—The patriotic autoist has another cause to rejoice, for now a third time an all-British car has carried off the Tourist Trophy. Success this year has rewarded the Rover, the production of the old Coventry bicycle firm, which now achieves its first victory in automobile racing. Second place has fallen to the Beeston Humber car, while



CURTISS IN WINNING ROVER ROUNDING WILLASTON CORNER.

no third competitor managed to finish the course. Such a statement must seem disappointing; in reality it is the weather and not the cars that must be held responsible.

Altogether 31 entries were made for the race compared with 43 last year, and even this small list was much reduced by withdrawals. Rolls found himself unable to defend his position as holder of the trophy and no less than six other cars were not completed in time. Of these the greatest disappointment was created by the absence of the new British-built Mercedes, which was to make its first appearance at the race. The remainder, small as it was, looked likely to be further reduced by some bad smashes which occurred during practice, but luckily replacements were effected in time and no further retirements were rendered necessary.

The principal condition of the race limited the fuel allowance to a gallon of gasoline for every 25 miles of road. This is, of course, the fundamental idea of the Tourist Trophy races and that it is a suitable method of preventing unduly high engine power without limiting too much the scope of the designers is seen in the adoption of this same principle in the Grand Prix race. Further latitude was this year allowed by the abolition of chassis weight limits, but an increase of the total load from 1,200 to 1,400 pounds has made the task somewhat more difficult. This load was in many cases made up by the use of cast-iron floor boards and by nailing sheet lead to the tonneau seats, and in view of the big dead weight it was significant to note that spare springs were being carried on many of the vehicles.

How the Contestants Were Examined.

The cars were assembled at the enclosure on Tuesday morning and much interest was aroused when the closing hour arrived, in view of last year's fiasco, when no less than six cars were disqualified through arriving a couple of minutes too late. Promptly at 10 o'clock the gates were closed, and almost immediately the Leader car—false to its name—came gently down the road. As this was the lowest powered car in the contest, some unkind persons suggest that the disqualification was intentionally gained. Inside the enclosure the cars were marshaled into line and, with observers on board, the procession led off to Quarter Bridge, where a level half mile had been marked off for the slow run on top gear. All successfully covered the distance at less than the specified twelve miles an hour, but the spasmodic jerking of some of the cars clearly showed the lack of flexibility of a high

geared high compression engine, with a carbureter finely adjusted for economical running. The other gearing test consisted of a stop and start on a 1 in 6 grade, but this was quickly disposed of without any trouble. Back at the enclosure the technical committee officials set themselves to the monotonous task of weighing up the cars and ballast, and seeing that the many and unnecessary regulations covering the body and chassis dimensions had been carried out.

Actual Stock Cars Mostly Utilized.

Observation of the cars ranked in long line in the tents revealed that the freak type of car was much less in evidence than at previous events. In many cases actual stock cars were utilized, with, of course, specially tuned up carbureter and higher gearing. The remainder had been specially built for the event, but were on the maker's standard lines and easily recognizable. The engines showed a tendency towards long strokes, and at the same time the compression had been raised to the highest possible figure. Carbureters seemed to afford the biggest scope for individual effort, and in nearly every case some special arrangement was incorporated in the design. Almost always the automatic air device was replaced or assisted by a hand-operated extra air inlet, and the new Gillet-Lehmann carbureter controller was found on five cars, the opinion of these drivers being that the device showed good saving.

The transmission gear was mostly devoid of novelties of construction. The direct drive on third speed and indirect fourth has naturally retained its popularity in an event where so much downhill rushing is required, but in one case, the Hillman-Coatalen car, this practice has been adopted with three speeds, the direct second giving up to forty miles an hour and being normally in use while on favorable grades, the indirect third taking it to



HUMBER (READ) AT BOTTOM OF KIRKMICHAEL DIP.]



MILLS IN BEESTON-HUMBER LEAVING HILLBRON.



J. P. HUTTON IN HIS BERLIET GOING WELL.

almost seventy miles an hour. This is well worth consideration for touring car work in view of the saving in length and complication in the gear box. As might be expected from the comparatively low power of the engines, shaft drive easily comes first in favor, side chains having but few adherents.

Wire Wheels Much in Evidence.

Perhaps the most interesting tendency to be noted is the general use of the wire wheel, fourteen cars out of twenty-two having adopted this practice. There can be no doubt as to the superiority of the wire spoke wheel for racing purposes and the absence of serious accident in spite of the constant serious side slips during the race must in great measure be due to the big lateral strength of this type of wheels. The majority of the wire wheels were of the detachable type just introduced by the Rudge Whitworth firm, a spare wheel complete with tire being put on inside of one minute. The few cars with wooden wheels had all removable rims. The examination and weighing in was not completed until Wednesday afternoon, and the measuring out of the allotted quantity of fuel had to be rushed through in order to finish before daylight failed.

Began in a Steady Downpour of Rain.

All previous racing events in the island have been favored with the best of weather, but at an early hour yesterday morning the weather conditions indicated a big change. A steady downpour of rain greeted the commencement of operations at 8 A.M., at which hour the cars were drawn out by horse to the adjoining hill leading down to the course. The roads were reported to be in such a greasy condition that the officials quickly decided to allow non-skid tires to be used, and this concession was quickly taken advantage of. This process delayed the start till well after the appointed hour, and it was close to half past nine when A. Lee Guinness received the word to go.

The red Darracq glided gently down the hill, with clutch out till the main course was reached a hundred yards away; then, with a roar the engine sprang into life and the car was off on its journey of six circuits of the 40-mile course. Almost immediately followed the second Darracq, with K. Lee Guinness at the wheel—the younger brother of the well-known Darracq racing driver. At half-minute intervals the word was given, and silently the cars went away, the scene affording a most pleasant contrast to the usual smoke and noise of a racing event start.

After the 22 Tourist Trophy cars had departed without incident, the nine heavies for the other event were sent away—looking unwieldy monsters with their big wind shields—and sadly the body of officials and pressmen tramped through the mire to the official enclosure, where round the timekeepers' box and the big scoring sheets a considerable body of spectators were gathered together. In but a short time the telephone station on the top of Snacfell mountain reported that the Hillman-Coatalen car was passing, the additional and cheerful announcement being made that the fog on the mountain had risen to such an extent that the cars could hardly be seen and that fast work was rendered impossible for more reasons than one.

Soon Coatalen rushed past the enclosure, having completed his first round in 1 hour 4 minutes, the fastest time of the day. As this car had clearly passed nineteen competitors on the road, its chances were looked upon as excellent, but unfortunately the driver took the sharp turn at Quarter Bridge at an excessive speed and ran into the curb stone, bursting a tire and breaking a rear spring. A quick repair was effected in less than ten minutes and the second round was covered in fast time, but the spring broke again and the popular driver had to retire.

Times Were Slow on Account of Rain.

Meanwhile the other cars were coming through at scattered intervals, but, as was only to be expected on account of the rain and the fog, the times were comparatively slow. Coatalen's time equaled 37 1-2 miles an hour, while the next best time was made by the Beeston Humber, doing 1 hour 13 minutes, or 33 miles per hour.

Hutton's Berliet had the misfortune to break a gear wheel at Pecl, and this unlucky driver was so much delayed that he was hopelessly out of the running. The rain came down unceasingly all the while, and already it was clear that the race was not going to be a success from the spectacular point of view.

The Quarter Bridge corner, which proved the undoing of Coatalen, was also responsible for the only serious accident of the day. The Star car, on the second round, skidded into the wall and seriously hurt the mechanic.

The times for the second round showed that the Arrol-Johnston, driven by Napier, the Trophy's first holder, was at the head, closely followed by the Beeston Humber and the Metallurgique.

The same order was maintained till the fourth circuit, when news of retirements came gradually to headquarters. Both Berliets were out of the race, the extraordinary reason being given that the gear boxes were full of mud. The Darracq of the younger Guinness broke its differential as the result of a bad skid at Ramsey, and the Coventry Humber, the most powerful car in the race, dashed straight into a house at Kirkmichel—hardly half a mile from its garage. Some excitement began to be shown now that the race was nearing its close.

At the end of the fifth round the five first cars were within seven minutes of the leader, and as the wet atmosphere was playing havoc with the fuel consumption, grave doubts were expressed that any car would be able to finish the course. The Metallurgique kept well ahead, and soon the message came through that it had passed Snacfell summit and had but the eight miles of down grade to cover. Two minutes later the Darracq of A. Lee Guinness passed the same station, while the Rover and Beeston Humber were still climbing up from Ramsey several miles behind.

And Then Came the Trophy Winner.

Minutes passed slowly at the finishing line, and no car came in sight. A quarter of an hour, and word was passed along by the signallers on the course that the Darracq was stopped for want of gasoline but two miles from the post. Other cars were

meanwhile finishing their fifth round, and as each came into sight great excitement prevailed when the whistle blew.

Suddenly "No. 22" was announced, and, with a wild swerve Curtiss brought his Rover to a standstill, victorious in his third essay for the Trophy. The winner reported the Metallurgique stopped for gasoline almost alongside the unfortunate Darracq, both having thus been robbed of victory when almost at the end of their journey.

The Beeston Humber came through a few minutes after the Rover, and took second place. Trouble with a wet magneto had delayed the car over 20 minutes in the last two rounds, otherwise the final placing would probably have been reversed. In this connection it is interesting to note that the Humber was one of the few cars which was not equipped with a second ignition system—a provision which would have obviated the fatal delay.

The time for the Rover was given as 8 hours 23 minutes, an average of close on 29 miles per hour. While this performance does not approach the 40-mile-an-hour gait of Rolls last year, nor the Arrol-Johnston 33-mile-an-hour average of the first race, it must be regarded as highly satisfactory in view of the thick fog on the mountain, which at times rendered it impossible for the drivers to see ten yards ahead.

The winning car ran most consistently throughout, and did not vary more than a minute on successive rounds. The car has 4-cylinder engine, 90-inch bore by 110 mm. stroke, with four speeds and live axle.

HOW THE HEAVY TOURIST TROPHY WAS WON.

While the Tourist Trophy of this and previous years has successfully catered for the car of from 16 to 24 horsepower, cars of higher power than this have been left without an event of sufficient competitive importance to stimulate the activities of makers. The institution of the Heavy Touring Car race was the outcome of this demand, and it was intended to include cars of power ranging up to 35 horsepower. The fuel-limitation principle of the Tourist Trophy race was retained, the allowance being fixed at one gallon of standard gasoline for every sixteen miles of the course. Owing, no doubt, to the late announcement of the race, the number of entries did not exceed sixteen, and of these seven were withdrawn.

The distance of the race was originally fixed at seven circuits of the course, or 281 miles, but it was later reduced by two circuits. On the morning of the race the officials suddenly decided to allow an extra one and a half gallons of gasoline in view of the heavy nature of the roads and the big wind, so that the allowance reached one gallon for every fourteen miles. The nine competitors consisted of a Cornilleau-St. Beuve, Berliet, Thorneycroft, Arrol-Johnston, Gladiator, two Ariels and two Beeston Humbers—an almost "all-British" representation.

After the Tourist Trophy cars had been got away, the nine of this heavy class were given the word at half-minute intervals. When but a few miles on his first lap, Arnott had trouble with his Arrol-Johnston and broke a wheel on a dangerous corner. This, strangely enough, was the only trouble experienced in this race, the remaining eight cars running till they finished, or till their fuel gave out. The two Ariels came round first in 1 hour 14 minutes, only seventeen seconds separating the two cars, which ran together very consistently. The big wind resistance can well be gauged by noting that this average speed for 45-horsepower cars—the biggest in the race—only reaches 33 miles an hour. Watson's Berliet came to the front at the close of the second circuit, but this lead was soon lost through tire trouble. Sangster's Ariel was at the head of the procession for the remaining laps and looked a certain winner, but with the worst of misfortune ran out of gasoline but half a mile from the post, twenty minutes ahead of the next car. The only cars to complete the last round were the Beeston Humber, driven by G. P. Mills, and the Gladiator. The Humber's time was 7 hours 11 minutes, or a 28-mile-per-hour average, compared with 7 hours

25 minutes for the Gladiator, and so the Beeston Humber firm carries off the trophy for the first time. It is a matter for comment that the winners in both events are firms who have long been identified with the struggle for supremacy in the British cycle market.

AUTOCYCLE TOURIST TROPHY RACE.

DOUGLAS, May 30.—The first of the annual races intended to be held by the Autocycle Club on the fuel-limitation basis of the Tourist Trophy races, was run off yesterday. Two classes were provided, the single-cylinder section being allowed one gallon of gasoline for every 90 miles, while the multicylinder machines had to cover 75 miles on a like amount. Of the twenty-six entrants in the two classes, but one failed to put in an appearance yesterday morning at the Tynwald Hill. The course covered 15 3-4 miles of hilly ground, so that ten laps gave a total of almost 158 miles to be covered.

At 10 A.M. the machines were started in pairs, the single-cylinder bicycles being rated at 3 to 3 1-2 horsepower, while the engines of the eight machines in the larger section were rated at 5 horsepower.

The favorite was C. R. Collier, on a Matchless machine of 3 1-2 horsepower, and from the start this rider made fast time, averaging 23 1-2 minutes for each lap; close behind came the elder Collier, and till half distance this pair kept at the head of the single-cylinder section. The fifth round ended, each competitor stopped for ten minutes to receive the second half of his gasoline allowance. The leader in the twin-cylinder section had the misfortune to have his machine take fire, and it was disabled. Some half-dozen competitors were retired, mostly through tire troubles. After a fast race, C. R. Collier finished in the good time of 4 hours 8 minutes, an average of 38 1-2 miles an hour over the hilly course. His gasoline consumption equalled 94 1-2 miles per gallon. Two Coventry-built Triumphs finished 15 minutes later, one having only used a gallon for each 115 miles. In the twin section H. Fowler won by 32 minutes in 4 hours 21 minutes, a good performance for an amateur in his first race. Fowler made the fastest lap of the day at an average of 43 miles an hour, which was good going for the course.



20-HORSEPOWER CLEMENT LEAVING PICTURESQUE GLENMOOR.



REMODELED AEROPLANE OF M. VUIA, PARIS, NOW FITTED WITH EIGHT-CYLINDER ANTOINETTE MOTOR DRIVING PROPELLER FORWARD.

AN AMERICAN'S FOREIGN TOURING EXPERIENCES

PARIS, June 9.—Cortlandt Field Bishop, of New York, who has just returned to Paris, had a perilous passage of the Alps in an automobile, by way of the Simplon Pass. He was accompanied by his wife.

"There was nothing on one side but the mountain, and on the other a precipice rising three or four thousand feet, and the slightest slip would have meant death," said he. "The trouble was that the tunnel, built to protect vehicles from avalanches, which naturally would make the more dangerous places safe, was all choked with snow and ice.

"My wife and I, therefore, were forced to go outside the tunnels, where the path was just wide enough to hold the wheels. There were no railings, and the few scattered stones on the edge of the cliff were no great protection. To make matters worse melted snow, which was knee-deep for half a kilometer, made the way perilous. My wife stayed with me in the car all the way.

Advises Americans to Cross Alps Via Simplon.

"The scenery was magnificent. I advise every American touring the Continent to cross the Alps by way of the Simplon Pass. I understand that this week fifty or sixty men are going to clear the tunnels, so that the danger will not be so great. At present the law reads that vehicles crossing the pass must only travel ten kilometers an hour, but this will be changed to fifteen soon, so that the crossing can be made in about three hours. The highest points in the pass are about 2,000 meters. I crossed Simplon June 5, four other automobiles crossing the day before. Last year about 300 made the passage.

"The annoyances of automobiling in Switzerland are very great. In some villages, such as those between Lausanne and Geneva, it is impossible to pass through at any speed without being fined. Annoyances are increasing to such an extent that the French motorists are talking of boycotting Switzerland.

Americans Should Know New German Rules.

"Touring Americans ought to know the new rules in Germany. If they travel with their American papers and arrive at the German border unprepared, it will be necessary to return to New York to have them viséd by the German Consul there. French papers must be viséd in Paris. If you tour Germany for only five days the auto tax is small, but over that there is a big increase. It is also necessary to purchase on entering Germany a large number to hang on the machine, for which is charged from

10f. to 20f., and one has to get a personal license. Added to this is a deposit with the customs officers, and the danger of fines and arrest by gendarmes.

"But in Italy it is just the other way. I have been going to Italy for years, and during my first trip had my head split by a peasant. I now find every one courteous, and don't remember hearing of any one fined. The import tax on benzine has been reduced from 48 centimes a liter to 24, and the roads are continually being improved. There used to be a great lack of road signs, but the Italian Touring Club has put up some 10,000 to 15,000 signs showing the directions. Next to France, Italy is the best place for touring, and there is more to see in Italy for Americans.

France Barred Italy from St. Louis Balloon Race.

"It is now definitely decided that Italy will not be represented in the international balloon race at St. Louis. It is the influence of the French that has brought about this result. This is a big misfortune to America, as the Italian aeronauts are very daring and accomplished. Lahm, who was stricken with typhoid fever and who has been very ill, is rapidly gaining his health, and is coming to Paris this week. Hawley, who is also to enter the cup contest, is expected here to-morrow and will make a number of practice ascents.

"Admiral Sigsbee is all wrong in his estimate of flying machines in time of war. I don't say that at the present time flying machines can absolutely destroy a fleet, although if France gets into war dirigible balloons will play an important part. But I would not now be afraid to sail over Admiral Sigsbee in an airship and dare him to do his worst. Airships are destined absolutely to revolutionize modern warfare, and no navy can be safe from them."

FIRST AUTOMOBILE RACE IN LAND OF CZAR.

Russia has held her first automobile race, from Moscow to St. Petersburg, in which French cars were the exclusive competitors. The course of 645 versts provided very bad going, Duray, who finished first on a Lorraine-Dietrich, being timed in nine hours and twenty minutes. A delay of about half an hour was caused by running over a dog. Champoiseau, who has recently abandoned the motorcycle for racing automobiles, came in second on a C. G. V. machine, two hours later. There were fifteen competitors. The race was held in connection with the first Russian automobile show now being held at St. Petersburg.

SUITABLE MATERIALS FOR AUTOMOBILES*

By ELWOOD HAYNES, OF THE HAYNES AUTOMOBILE COMPANY.

SINCE the first attempt to build automobiles, in the '90s, experimenters have had difficulty in getting materials suitable for the purpose. Steel of high tensile strength was employed, but the results were ever the same. Lower carbon steels were tried, but they lasted only a few weeks or months and then broke short off. Swedish iron did not break, but when the first hard bump was encountered it took a set, and the wobbling rear wheels indicated what had happened. Finally a steel of moderately low carbon was introduced which gave only fair results, and if the car was driven for any length of time over rough roads this also crystallized and broke off.

One of the First Uses of Nickel Steel.

In 1899 a nickel steel axle was introduced into a machine by Messrs. Haynes & Apperson, and the car made successfully a trip from Kokomo, Ind., to New York, a distance of about 1,000 miles, without serious breakage of any kind. This axle was made by the Bethlehem Steel Co., of Bethlehem, Pa., and, so far as is now known, was the first material of this kind ever introduced into an automobile. Nickel steel was used in the axles of cars of this construction for about five years, and not a single case of breakage occurred during that period. Not only was this steel found to be practically free from crystallization, but it possessed a very high elastic limit—about 70,000 or 80,000 pounds—and a tensile strength of over 100,000 pounds, with an elongation of about 15 or 20 per cent.

Soon afterward nickel steel was introduced into the construction of driving chains, and showed great superiority over those formerly made of ordinary steel. When the sliding gears were first used on the automobile for the purpose of changing the gear ratio between the motor and rear axle, trouble again asserted itself in breakage. In vain were gears made of the best form of tool steel; the ends of the teeth would break off when an attempt was made to throw them suddenly into engagement by means of the shifting levers. Trouble of a very serious nature resulted from this, as pieces of the broken teeth would get into the other gears, thus causing them to break, and sometimes the entire train of gears would be almost ground to pieces on account of the breakage first of one gear and then of another.

Nickel Chrome Steel.

Machinery steel, case hardened, was tried, and, while this gave better results, it was by no means satisfactory. The injury and breakage of sliding gears were taken as a matter of course, and almost every person possessing a car equipped with these gears expected sooner or later to make a number of replacements.

It was finally discovered that an alloy consisting of iron, nickel and chromium possessed most remarkable properties. Not only could the steel be hardened by heating to redness and quenching in oil, but it could be given a considerable amount of toughness at the same time by drawing the temper somewhat after the first hardening. If the steel was properly made and afterward properly treated, it was found to be almost impossible to break one of the teeth in a six-pitch gear by means of a heavy hammer. So successful were these gears that they rendered it possible to run an entire season sometimes without the breakage or serious injury of a single tooth. Front axles, steering knuckles, and other important parts requiring high elasticity were made of this steel in certain cars with very good results.

Alloy Tool Steel.

The greatest difficulty encountered by the manufacturer was in the working of the steel, which was found to be extremely diffi-

cult. Fortunately, about the time of its early introduction, a tool steel was discovered which possessed most remarkable properties. This steel consists mainly of an alloy of tungsten, chromium and iron, with but a very small per cent. of carbon. One of the most remarkable properties of this steel is its capability of becoming very hard and tough when quenched from a glowing white heat by dipping into a bath of oil. This method of tempering would ruin ordinary tool steel, but it produces in the tungsten chromium steel a substance which is capable of cutting the hardest forms of nickel steel and nickel chromium steel with comparative ease. While this alloy tool steel is not used in the actual construction of automobiles, it is referred to because its use is essential in the turning and machining of the high-strength alloy steel.

It has been found that the manufacturing and working of nickel chrome steel requires great care, as there seems to be some tendency toward segregation when the steel is in the process of making, which gives rise to hard and soft spots in the finished metal. If an attempt is made to manufacture gears from material of this character, it will be found that some of the teeth are extremely hard while others are just about the right hardness. On the other hand, even if the steel is of uniform composition and texture throughout, it will not stand very great variation of temperature without danger of injury, since it is very sensitive to heat treatment. When properly made and properly treated, however, it is perhaps the most resistant substance yet produced, so far as the resisting of shocks and blows is concerned. It has been found almost impossible to break a tooth from a six-pitch gear made from this material, even with the use of a heavy hammer. This renders it especially suitable for sliding gears which are subjected to the destructive action due to the striking of teeth when forced into mesh while in motion.

The following may be taken as a test of high-quality nickel chrome steel, made by the Krupp Company, of Essen, Germany. It will be noted that much depends upon the treatment of the steel:

Dimensions of Test Bars, 5.91" Long and 0.59" Dia.

	Normal	Slightly Hardened	Greater Deg. of Hardness
Elastic limit, lbs. per sq. in.	86,909	148,072	193,589
Tensile strength, lbs. per sq. in.	111,943	165,326	221,325
Elongation, per cent.	14.5	9.1	7.7
Contraction, per cent.	64.0	55.6	46.2

It will be noted from the above tests also that under the hardening treatment the tensile strength rises rapidly, and the same may be said of the elastic limit, rising as it does from 86,909 pounds to 148,072 pounds when slightly hardened, while the tensile strength rises from 111,943 to 165,326. With a greater degree of hardness the elastic limit reaches 193,589 and the tensile strength 221,325. It will be also noted that the elongation gradually diminishes from 14.5 per cent. in the normal steel to 7.7 per cent. in the more highly hardened specimen. The contraction of area also falls from 64 per cent. in the normal to 46.2 per cent. in the highly hardened steel. The contraction of area does not suffer so much as the elongation. The comparatively small loss in contraction of area is a good sign, since it indicates that the texture of the steel has been well preserved under treatment.

Plain nickel steel containing a very small per cent. of carbon is also a good safe material for automobile work. The following may be taken as an example of a mild low carbon nickel steel:

Elastic limit, 65,146; tensile strength, 81,561; elongation, 23.9 per cent.; contraction of area, 71 per cent.

It will also be observed from this that while the elastic limit is quite low as compared with the nickel chrome steel, it is high as compared with ordinary carbon steel, and that the elongation and contraction of area are very high indeed, indicating a very safe material for almost any construction. This material not only pos-

*Paper read before the American Society of Mechanical Engineers at Indianapolis.

esses these excellent properties, but resists dynamic stress remarkably well—in fact, if the dynamic stresses are not too close to the elastic limit of the steel it will preserve its strength and quality for an indefinite time. The following tests indicate the quality of this material as compared with carbon steel:

Carbon steel, 15,000 vibrations; nickel steel, 34,000,000 vibrations (not broken).

The former shows the carbon steel under combined torsion and vibration, and the latter nickel steel under the same test. It will be observed that whereas the carbon steel withstood only 15,000 vibrations, the nickel steel was not broken under 34,000,000 vibrations.

Vanadium Steel.

Besides the steels already mentioned, there is another which is now attracting considerable attention—namely, that produced by adding a small quantity of vanadium to a nickel steel or chrome steel. Since vanadium has until recently been classed among the very rare elements, it may perhaps be in place to mention a few of its properties. It is prepared from the chlorid VCl_3 , which is reduced by means of a current of hydrogen gas, the chlorid being heated while the reduction is taking place. Simple as this process may seem, it is one of the most difficult known to chemists, and it usually requires three or four days to prepare a fraction of an ounce of the metal by this process. Until quite recently this element and its compounds, owing to their rarity, were very expensive, but we are now assured by the American Vanadium Co. that a sulphid of vanadium has been discovered in an immense quantity in the Andes Mountains of South America, and that they are now prepared to furnish the metal in the form of a ferro alloy, known as ferro-vanadium, in any quantity desired.

This ferro-vanadium contains about 20 per cent. of the latter metal and is readily incorporated with the iron or steel during the melting, either in the open-hearth or crucible process. Mr. J. Kent Smith, who has given the subject of vanadium steel much attention, advocates the open-hearth process as preferable to the crucible process for the making of this steel. This steel possesses most remarkable qualities, notwithstanding the small quantity of vanadium which it contains. One of these is the closeness with which its elastic limit approximates its tensile strength; and, since the former quality is the one in which the greatest dependence is placed, this is a very desirable characteristic. The sharp contraction of area, also a characteristic of this steel, together with the silky fracture it usually presents, is also a strong indication of the splendid quality of this material. Moreover, the fracture is nearly always of this quality, even though the steel has been highly tempered.

The following are the results of some tests made on oil treated bars of the above steel: It is a rather remarkable fact that the vanadium, alone or with carbon, does not give much character to the iron or steel, but when a third element is introduced, such as nickel or chromium, the characteristics of the steel are changed for the better. Whether the vanadium acts as an essential element in the composition of the steel or principally as a purifier is not fully known; it has been found, however, that a certain amount of the vanadium introduced (about 1-4 per cent.) must remain in the steel in order to give it its characteristic properties. Vanadium, however, has a strong affinity for nitrogen as well as for oxygen, and it may be that it acts as a purifier of the steel by combining with minute quantities of nitrogen gas, which might otherwise be occluded in the steel and thus interfere with its compactness and strength.

It will readily be seen that the high elastic limit, strong contraction of area and splendid silky fracture, together with the large number of vibrations which the steel endures under dynamic stress, most strongly recommend this steel as almost ideal for many parts of the motor car. The writer has made some experiments in the forging, and found that it works well under the hammer, though it must not be allowed to become too cold or it will resist pounding to a remarkable degree. It is not readily

injured under the forging hammer, provided due care be taken not to heat it too rapidly. Another valuable property of the steel is the fact that it machines more readily than nickel chrome steel—in fact, more readily than plain nickel steel.

Bronze.

The use of bronzes in the motor car must necessarily be restricted to parts requiring low rigidity, and usually also moderate strength. While it must be admitted that samples of bronzes can be made that approach closely to fairly good grades of steel in tensile strength, elastic limit, and contraction of area, it must also be remembered that the modulus of rigidity of iron and steel is about 28,000,000 pounds, for example, while that of bronze is only about 15,000,000 pounds. This means that a bar of bronze of a given size and form, under given conditions, will deflect nearly twice as much under the same load as a similar bar of iron or steel. In most parts of the car this feature is objectionable, since changes of alignment are likely to occur, unless the parts which are made of this material are especially well designed.

Notwithstanding the above objection, the readiness with which bronze lends itself to the production of castings of various parts, and its freedom from crystallization under dynamic stress, have led to its introduction into many of the minor parts of the motor car, such as small hand levers, carbureters, tubing, crank cases, gear cases, etc. In general, it may be said that it is suitable for the small levers, such as those used for controlling the sparking mechanism, carbureter, etc. Another use for this metal is in bearings, although these require a decidedly different composition from that used for levers, crank cases, and like parts.

The parts requiring strength are usually made from nickel bronze, phosphor bronze, manganese bronze, or aluminum bronze, while the bearing bronzes are composed usually of lead, tin, and copper in various proportions. Under this latter head come also the so-called babbitt metals, which vary greatly in their composition, some of them being composed of lead, copper, tin, and antimony, others of lead, tin, zinc, and antimony, and still others of lead, tin, and antimony. It is not the purpose of the writer to discuss the merits of these various bearing metals, since a number of very good ones can readily be obtained on the market.

Besides the above alloys, pure copper is used to a considerable extent in the construction of radiators, gasoline tanks, etc. It is well adapted for the construction of radiators, since it can easily be soldered; is one of the best conductors of heat, and is readily formed into almost any shape on account of its malleability, ductility, and comparative softness.

Aluminum.

Aluminum is now used very largely in automobile construction, and it is a significant fact that it was first introduced into the automobile in America, though the French used it to some extent quite early for a few minor parts of their machines. Pure aluminum is used only for a few special purposes, and even then to a limited extent—most notably for tubing and radiators. It is quite well adapted for the latter purposes in many respects, but the comparative difficulty experienced in soldering it is somewhat of a drawback. On the other hand, when alloyed with copper or some other metal giving it increased hardness and elasticity, it is well adapted for various purposes, such as seats, gear cases, crank cases, dashes, and various other parts of the car. Its extreme lightness, together with the ease with which it may be machined and the facility with which it may be cast, renders it very useful for many parts of the machine.

An alloy of zinc and aluminum seems to have considerable rigidity and elasticity, as well as quite high tensile strength. It is also cheaper than the aluminum-copper alloy, but experiments made by the writer indicate that this alloy is not safe if subjected to repeated vibrations, since it seems to fatigue quite rapidly and sooner or later breaks off short. For example, a 1-2-inch square bar made of an alloy of aluminum and zinc withstood only about 15,000 vibrations before breaking, while an alloy of copper and

aluminum withstood 1,600,000 vibrations of the same aptitude and frequency without breaking or showing any signs of injury except a very slight set. Aluminum also forms a very light alloy with magnesium, which, however, is too expensive for ordinary use and is somewhat difficult to handle in quantity. A number of other alloys of aluminum have been prepared and to some extent used in automobile construction, the most notable, perhaps, of which is an alloy of tungsten and aluminum, which has been used to a considerable extent abroad, but is not used in American cars so far as the writer is aware.

From the foregoing it may be said that the following substances have proved suitable for the various parts of the automobile:

- a For rear live axles, nickel steel containing from 4 per cent. to 5 per cent. nickel and less than 0.3 per cent. carbon.
- b For front axles, steering knuckles, propeller shafts, etc., vanadium steel.
- c For sliding gears, nickel chrome steel hardened throughout, or mild nickel steel case hardened.
- d For crank shafts, nickel steel or vanadium steel.
- e For frames, low carbon open-hearth steel, mild nickel steel or nickel chrome steel.
- f For nearly all other parts of the car, such as hand levers, tubing, etc., a good open-hearth steel of comparatively low carbon—say 0.4 per cent. or under—is of suitable quality, since there is no advantage gained by using high-class steels for these purposes, for the reason that the rigidity of these parts is of prime importance, and in order to make them sufficiently rigid they must be made much more than sufficiently strong; therefore, since all steels are practically equal in rigidity, one steel is, broadly speaking, as good as another for these parts.

The use of bronze should be restricted largely to minor parts; the reducing gear wheels, small levers, etc., can be made of phosphor bronze, while the bearings should be made of some good composition bronze (an alloy of copper, lead, tin, and zinc answers well for this purpose), but the main bearings for the engine, such as the crankshaft, crank pins, etc., should be made of a special bearing metal, which is very firm and at the same time will not injure the crankshaft in case the lubrication becomes deficient. The crank case of the motor, the gear case, and other similar parts may well be made of aluminum, since it is light, strong, and easily cast into the proper shape. Steel would answer for the above parts if it could be conveniently worked into the proper form.

It will be noticed from the foregoing that the most progressive automobile builders have spared neither pains nor expense in obtaining the very best materials that can be produced, because, in

order to obtain the highest results in automobile construction, it is necessary that material of superior quality shall be used for certain parts of the machine. Perhaps there is no form of construction that taxes the ingenuity of its builders more severely than the building of a good automobile. Take, for example, one of the high-powered touring cars, carrying from five to seven persons and equipped with a motor of 50 horsepower. Now consider that this motor is sometimes geared down to such an extent that its direct torque is multiplied ten or twelve fold on the rear axle; consider further that the driver of the machine is often entirely inexperienced and, to a large extent, ignorant of the strength of the material and the use of power, and it will be realized that the chances for trouble when driving an automobile are certainly very great.

Now add to the stresses and possible abuses from the foregoing the severe jolting and jarring of the rough roads in America, and some idea may be formed of the severe ordeal through which an automobile must pass during a season's run. It has been the general experience of builders that the more ignorant the owner of the machine the greater his complaint. On the other hand, those who are versed in mechanical matters and who know the sizes of parts generally used for heavy stress, often marvel at the strength and endurance of the modern automobile. Factors of safety must be reduced to the minimum in nearly every part of the machine, or excessive weight is sure to occur. Many high-class machines weigh less than 70 pounds to the horsepower, passengers included. Of course, it is not expected that the motor shall be used constantly at anything near its maximum horsepower. One tenth of its brake horsepower is enough for almost any automobile motor when in daily use. High power is simply intended to meet emergencies; but the material throughout the machine must be strong enough to withstand any stress momentarily applied.

The following table gives approximately the strength of various materials used in automobile construction:

Table 2. Strength of Automobile Materials.

	Modulus of Rigidity	Limit Elastic	Strength Tensile
Aluminum alloys	8 to 11 million	10M to 15M	20M to 30M
Phosphor bronze	12 to 14 million	20,000	30,000
Manganese bronze	15 million	35,000	50,000
Aluminum bronze	15 million	50,000	75,000
Wrought iron	23 million	30,000	40,000
Mild open hearth steel....	23 million	40,000	60,000
Tool steel	23 million	80,000	110,000
Nickel steel	23 million	80,000	110,000
Nickel chrome steel	30 million	160,000	130,000
Vanadium steel treated....	30 million	220,000	228,000

All of the above materials stand well under dynamic stress, with the exception of the tool steel, which should not be used for this purpose.

OFFICIAL FIGURES ON AMERICAN AUTO PRODUCTION

UNDER the title of Bulletin 66, Bureau of the Census of the Department of Commerce and Labor, a complete statistical review of the automobile and bicycle industries during the years covering the period from 1900 to 1905 has been prepared. This is the most comprehensive work of the kind ever attempted in connection with the automobile industry, showing, as it does, the number of establishments, capital and labor employed, wages paid, average number of operatives, types of cars built and many other items of information never collated previously.

The work is naturally too exhaustive to attempt to review it here, but it is interesting to note among some of its tables the fact that in 1900 the State of Michigan reported no automobile factories, whereas in 1905 it had twenty-two and turned out not far from 10,000 cars in that year. New York, on the other hand, had 15 in 1900 and only 21 in 1905, its production of cars only increasing from 521 to 1,808 in that time.

Another isolated item that is of considerable significance is to

be found in the statement that "custom work and repairing amounted to but \$73,824 in 1900 and rose to \$851,053 in 1905, the amounts representing repair work almost exclusively."

It is further interesting to note the standing of the various states as automobile producing communities, Michigan now being at the head, with Ohio second, New York third, Connecticut fourth, Massachusetts fifth, Wisconsin sixth, and Indiana seventh, this, of course, representing the relative standing in 1905.

The bulletin also contains a great deal of other detailed information, including that covering allied industries and those not devoted entirely to the manufacture of automobiles, showing in a most striking manner not alone the truly tremendous development to which the automobile industry as a separate entity has attained, but likewise the vast increase in the prosperity of a score or more of other branches of trade for which it has been responsible in this country. The statistics cover every possible phase of both the main and allied industries and are of great value.

RECREATIVE READING OF DIAGRAMS*

By L. BAUDRY DE SAUNIER.

THE mere mention of the word diagram is liable to cause the reader to turn away his head; he looks upon it as a closed science, the utility of which has never been proved. Consequently, he fingers the pages and passes on. If I had to tell my reader, at present so uninterested in diagrams, that these curves would

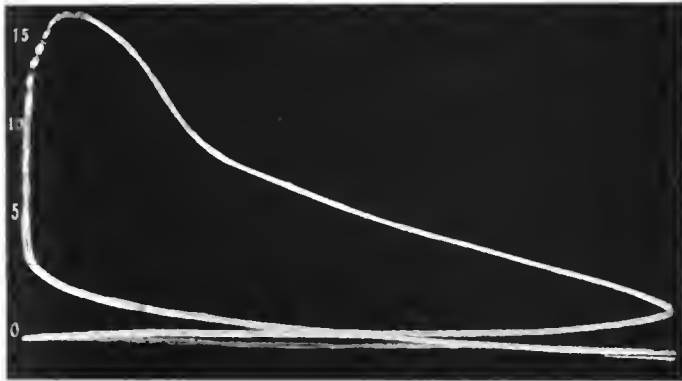


FIG. 1.—Photographed diagram furnished by a four-cylinder motor. Slight depression during intake, good, but slightly retarded explosion; pressure falls rapidly during first quarter of stroke of piston; slight back pressure from muffler during exhaust stroke.

become to him a real recreation; that there are few pictures that would interest him so much (on condition that he lends me his attention for a quarter of an hour), and that he can read these hieroglyphics without any calculation, he will probably think that I am abusing whatever confidence he has in me.

But to come down to our diagrams and the recreation that they are going to give us. The automobile type of motor most usually employed is, as is generally known, a gas engine, the propulsions of its cylinder or cylinders being due to a series of explosions

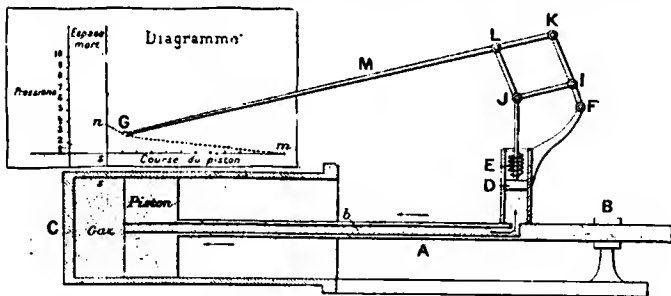


FIG. 2.—Sketch of an apparatus for making diagrams. A, hollow tube of piston; B, guide for piston tube; C, cylinder; D, small cylinder; E, spring; F, articulation of parallelogram I, J, K, L; M, arm with pencil attached; G, pencil; s, s, end of piston stroke; b, pressure tube; m, n, curve indicated during compression stroke.

within a closed chamber. It is known also that the power of a motor depends on a number of factors, the principal of which (bore, stroke and number of revolutions being equal) are the quantity of gas and the weight of it absorbed by each cylinder, the point at which the charge is ignited, etc.

But how can the constructor, or even the amateur, know the exact operation of these factors? If a motor possesses less power than its neighbor, apparently identical with it, how can it be known exactly wherein lies the weakness? The constructor could grope; but would he find the defect? Besides, what certitude has he that the motor is giving all the power of which it is capable? And what is there to tell him where to direct his operations?

He must make the motor speak and tell where it is suffering. True, a motor cannot speak; but at any rate it can write, and write with inconceivable accuracy, telling all that is passing within its cylinders and making known all its secrets.

*Translated from *Omnia* by W. F. Bradley

This property of motors is not of recent origin, since Watt toward the end of the eighteenth century, applied to his machine an apparatus by which he could measure the pressure in the cylinder at any point of the stroke. The apparatus which serves as "writing table" for the internal explosion motor has no resemblance with that used for Watt's slow machine. Inventors had serious difficulties in the search for an apparatus which would resist the brutal shocks of an internal-explosion motor, giving frequently twenty, twenty-five, and more explosions a second, without running wild in this terrible dance.

We will not for the moment at any rate, study the apparatuses designed for taking diagrams of the pressure within our motors; but we will see how they work and try to read together some of the notes drawn up by the motors on which they are fitted.

What we want to know is the pressure of the gas, either fresh or spent, at every moment of the stroke of the piston. This will allow us to modify the general arrangement or regulate parts to obtain the maximum power. If, for instance, we note that during the intake the gas entering the cylinder has a distinctly lower than atmospheric pressure we should conclude either that the valve opening was insufficient or that the piping offered an abnormal resistance to the passage of the mixture.

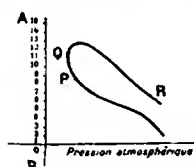


FIG. 3.—Imaginary diagram indicating variations of pressure.

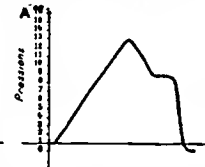


FIG. 4.—Imaginary diagram indicating variations of pressure and depression (below atmospheric).

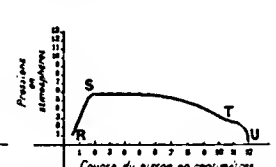


FIG. 5.—Imaginary diagram indicating variations of pressure in relation to positions of piston in cylinder.

If at the moment of ignition we find a low pressure, we conclude either that the mixture is bad or that the ignition is defective. If, when the exhaust takes place, we find that the pressure in the cylinder does not suddenly drop, we are warned that the valve opens badly, that the muffler is closed, or that the piping is too small.

To obtain a knowledge of the pressure in the cylinder all that is necessary is to unite the interior of the cylinder to a small vertical piston, *D*, on the connecting rod of which has been fixed a pencil, *G* (Fig. 2). The greater the pressure in the cylinder the higher will the piston *D* mount. The spring *E* brings it down when the pressure is lowered. The pencil *G* is made to bear on a sheet of paper having a scale of pressures on the left-hand side,

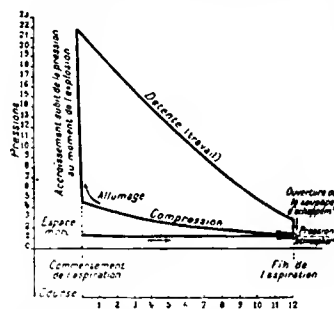


FIG. 6.—Approximate theoretic diagram. The maximum efficiency, impossible to obtain in practice, is indicated. Compare this with Fig. 7.

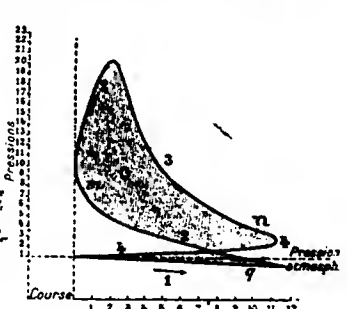


FIG. 7.—Actual diagram. I, intake with slight depression; compression and explosion, firing at point m, indicated by 2; there is sluggishness in firing charge; expansion (working stroke) is shown by curve 3, valve opening at n.

each division being equal to one atmosphere. The atmospheric pressure (that at which we live and at which our motors aspire) is at division *I*.

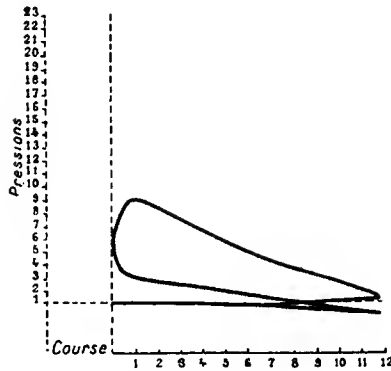


FIG. 8.—Diagram of a weak charge. Much resistance to admission; weak compression; feeble working stroke.

its working. The same for Fig. 4: The pressure mounted rapidly to 13 atmospheres; descended briskly to 9; remained stationary a little time, then fell rapidly to zero.

One element is missing in our observations. We know that the pressure increases and diminishes, but we do not know the positions of the piston corresponding to these variations. To complete our elements, therefore, we must obtain not only the pressure in the cylinder, but at the same time a registration of the position of the piston. Maintaining the vertical scale showing the atmospheric pressure, we establish a horizontal scale (Fig. 5) which will indicate in centimeters—the movement of the piston. Let us suppose that it is a piston with 120 m.m. stroke, or 12 centimeters.

We had seen then by Fig. 5 that the pressure of $5\frac{1}{2}$ atmospheres at point *S* was at the moment when the piston had travelled about 2 centimeters; that at *T* there was a sudden lowering of pressure between the tenth and eleventh centimeters, and that the pressure fell to zero at the end of the stroke.

With these indications it is easy to understand the working of the apparatus illustrated in Fig. 2. The piston *D*, in communication with the interior of the cylinder, moves the pencil in a vertical sense and enregisters pressure; but at the same time the displacement of the piston of the motor carries along this smaller piston and, in consequence, the pencil *G* in a movement from left to right and right to left. There are two pressures at work on the pencil, one moving it vertically and the other horizontally. Influenced by the two forces, curved lines are generally traced.

Supposing that in Fig. 2 the piston is compressing a mixture. We see that the pressure has gradually and normally increased from the point *M*, commencement of the compression, up to point *G*. The piston has still 1 centimeter to travel to reach the end of the stroke. The pencil would then be at *n* and the pressure would reach 4 atmospheres.

Let us now see what curve would be traced for a complete cycle of an internal-explosion motor. Theoretically the operation is as follows: The intake valve opens and aspiration commences (Fig. 6), the piston travelling to the end of its stroke and the cylinder filling. On this stroke the pressure is that of the atmosphere, and we obtain a distinct horizontal line. On the second stroke the piston returns, compresses the gas and in-

If the apparatus should describe the imaginary curve shown on Fig. 3, we should read that the pressure had at first been 2 kilograms; that it had reached $8\frac{1}{2}$ atmospheres at point *P*; had mounted to $11\frac{1}{2}$ at *Q*; that it had slightly exceeded 12 at the maximum; remained at this pressure for a very short time, and rapidly descended to 6 atmospheres at *R*, at which point we interrupted

creases the pressure, consequently the curve mounts more and more upon itself. Let us suppose a maximum pressure of $4\frac{1}{2}$ atmospheres. The curve shows $4\frac{1}{2}$ at the end of the stroke. At this instant—still considered theoretically—the spark is given and the pressure increases instantaneously to 21 or 22 atmospheres; the piston descends rapidly, the gases expand, and the pressure is lowered with rapidity. When the piston reaches the end of its stroke the exhaust valve opens and the spent gases quickly fall to atmospheric pressure. On the fourth stroke the piston ascends and drives out the gases. Supposing that the resistance of the piping and the air striking the gases is nul, the pressure in the cylinder during this stroke remains that of the atmosphere and the line of the fourth stroke is a horizontal one, covering exactly that of the first stroke. The surface outlined by the straight lines and curves represents the quantity of useful work effected by the charge.

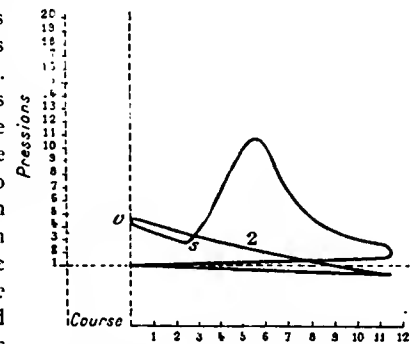


FIG. 10.—Diagram of charge with retarded ignition. Firing has not been done during compression stroke (curve 2); the gas, in expanding, has lost some of its heat, and pressure has fallen from *v* to *s*. Charge being fired at *s*, value of working stroke greatly diminished.

Fig. 7 is an actual diagram of a motor having certain defects, but still being very near the average. It will be seen that the surface circumscribed by the upper curve *Q* (from which must be deducted the surface of the small circle *q*, representing negative labor) is distinctly less than that of the theoretical diagram.

In reality the admission valve, the passage of air into the carbureter, etc., offer a certain resistance, producing a slight depression during the intake stroke and causing the line of the first stroke to descend below atmospheric pressure. The line for stroke 2 (compression) mounts progressively toward the maximum, the heat engendered by compression carrying it to 6 or 7 atmospheres. At this moment the gases are ignited.

It is interesting to note the messages that the motor gives us and to read its cry of suffering. Take Fig. 8 for instance. The motor is asking for more food. The admission line descends considerably below atmospheric pressure, a sign that gas is not arriving readily, compression is feeble, and the explosion weak.

Fig. 9 shows ignition too far advanced in a cycle of operations that commenced well. The charge was fired at *s*, when the piston had still 3 centimeters to cover; it ought to have taken place near the point *m*. In Fig. 10 ignition has been enormously retarded. Firing not taking place at the latest point, *v*, the point *s* passes below the compression line, for the non-firing gases at the point

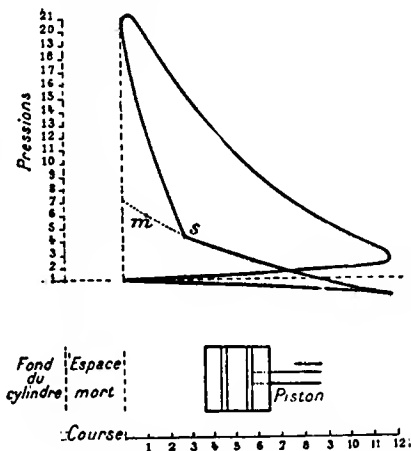


FIG. 9.—Diagram of charge with spark advanced too much. Firing should have been at *s* instead of at *m*.

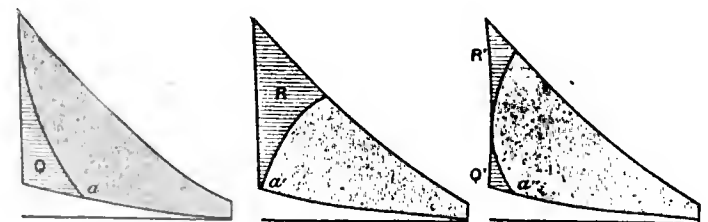


FIG. 11.—Scheme showing regulation of firing point, charges being fired at *a*, *a'* and *aa'*. At what point of compression stroke should charge be fired to obtain maximum power?

when the piston redescends do not benefit by the compression. To make further experiments, with a view to finding the best firing point he will see by Fig. 11 that if the charge is fired at *a* he departs from the theoretic diagram according to the value *Q*. He has fired too soon. If he fires at *a'* he has departed from the theoretic diagram by the value of the triangle *R*. He has fired too late. By firing at *a''* he will only be removed from the theoretic diagram by the value of the two small triangles *Q'* and *R'*, which together are less than the two preceding ones.

EFFECT OF SIZE ON THE THERMAL EFFICIENCY*

By H. L. CALLENDER, F.R.S.

It is generally admitted, as already explained, that the thermal efficiency—and consequently the mean effective pressure for a given rate of fuel consumption—varies with compression-ratio very nearly in the proportion given by formula (2) for the air-standard. It would be easy to take account of this in the rating formula by substituting for the constant 0.40 in the A. C. formula the value E of the air-standard efficiency corresponding to the actual compression-ratio in the engine. The value 0.40 for the air-standard efficiency corresponds to a compression-ratio of 3.5, which is not uncommon in petrol motors, giving a compression-pressure of 70 pounds above atmospheric. By increasing the compression-ratio to 5.0, the factor E would be increased to 0.48, giving an advantage of 20 per cent. in point of power, of which the A.C. rating takes no account. But this advantage is obtained at the expense of increasing the compression-pressure to 118 pounds, which means that all parts of the engine ought to be made nearly twice as heavy to secure equal safety and smoothness of running, because the maximum pressure and the inequality of torque vary nearly in the same proportion as the compression-pressure.

The obvious objection to including the effect of compression-ratio in a rating formula, is that the volume of the compression-space is not easy to measure directly. It is, however, a comparatively simple matter to observe the effective compression-pressure by inserting a pressure-gauge with a check valve in place of the spark plug. This method has the advantage that the variation of the compression-pressure is much greater than that of the factor E , so that an error of one or two pounds is not a serious matter. The same method would also take account of any super-compression devices which might conceivably be employed to get more power out of a given size of engine. It is certainly most important that some account should be taken of compression ratio in fuel-consumption trials.

Effect of Size on the Mean Pressure.

As already explained, the variation of the thermal and mechanical efficiency with size, is such as to make the mean pressure equivalent to the B.H.P. vary approximately in the proportion given by the factor $(1 - 1/D)$, for similar engines. This factor may also readily be included in the formula, which then becomes, Efficiency Rating B.H.P. = $C D (D - 1)$. (P.C.)

A formula of this kind, in which account is taken of the effect of size, is most useful in comparing the performances of small engines with large, or of multicylinder engines with single-cylinders of equal power. According to the A.C. formula, a four-cylinder engine with 2 inches bore and stroke (like the F.N. motor cycle engine), is rated at 6.4 horsepower, and is equivalent to a single-cylinder of 4-inch bore. According to my experiments the four-cylinder of 2-inch bore could not develop much more than 4 horsepower under ordinary conditions, and would stand no chance against the single-cylinder of 4-inch bore. A four-cylinder of 3-inch bore is equivalent to a single-cylinder of 6-inch bore by the A.C. rating, but according to the P.C. rating the single-cylinder would have an advantage in point of power of 25 per cent. A two-cylinder of equal power on the A.C. rating would have an advantage of about 12 per cent. over the four-cylinder, and a six-cylinder a disadvantage of about 10 per cent. These differences are far from negligible, though they diminish in importance as the size is increased. In practice, these disadvantages of the multicylinder type might no doubt fairly be set against the advantages of reduced weight and more uniform torque, but the necessity of applying some correction remains in comparing different sized engines of the same type.

* Extract from paper read before The Institute of Automobile Engineers, London, continued from THE AUTOMOBILE, June 6, page 934.

An obvious objection to the P.C. type of formula is that the B.H.P. of an engine of 1-inch bore and stroke would be zero. According to the A.C. rating it should be 2-5ths of a horsepower. It would no doubt be possible to get such an engine to run if very delicately made, but the effect of ignition lag would be serious at the normal speed of 6,000 revolutions per minute, and I doubt whether it could be made to give as much as 1-10th horsepower on the brake. Another objection that has been urged against the formula is that the dimensions are not homogeneous. This is incorrect, because the figure 1 in the formula stands for 1 inch, and represents a length. If the bore is measured in millimeters the formula would read, B.H.P. = $D(D - 25.4)/1290$.

The effect of size on the thermal efficiency of small engines, according to the P.C. rating, is nearly as great as that of compression-ratio. The effect of increase of bore from 2 to 4 inches is to increase the thermal efficiency 50 per cent. To produce a similar effect would require an increase of compression-ratio from 3 to 5, and of compression-pressure from 51 to 118 pounds. If it is thought desirable to take account of compression-ratio in consumption trials, the effect of size should also be allowed for. Both are included in a comparatively simple manner in the P.C. formula. For this reason it may be called the Petrol-Consumption (P.C.) Rating, because it gives the relative power for corresponding rates of consumption, *i.e.*, at equal piston-speeds. It takes no account of piston-speed, and corrected for compression the P.C. rating becomes—

$$\text{B.H.P.} = 2.5 E D (D - 1) / 2.$$

Variation of Efficiency with Ratio of Stroke to Bore.

The chief advantage, in point of thermal efficiency, of increasing the length of stroke, especially in engines with high compression, is that the ratio of surface to volume in the combustion chamber may be thereby reduced. The surface of the combustion chamber is the most important in this respect, because the temperature, the temperature-gradient, the pressure, the time of exposure, and the velocity of turbulent motion, are all at a maximum during ignition, and because any loss incurred here affects the whole of the subsequent stroke and produces a maximum effect on the mean pressure. The remainder of the loss under consideration may without serious error be assumed proportional to that which occurs in the combustion chamber. Assuming the combustion chamber to be cylindrical, neglecting pockets, the ratio S/V of surface to volume will be $4/D + 2(r - 1)/L$, where L is the stroke and r the compression-ratio. If the term A/D represents the variable losses proportional to S/V , and if the coefficient A has the value unity for engines for which SD/V is 9, the value of A for any other engine should be $(4 + 2(r - 1) D/L) / 9$ under similar conditions. This reduces to unity in the case where $L = D$, and $r = 3.5$, which we have taken above as the standard case for petrol motors. The value of A will be the same for all engines for which $2(r - 1)D/L = 5$. If we assume that the ratio of stroke to bore is related in this way to the compression-ratio, no alteration in the value of the constant A is required. Complete account of the variation of efficiency is taken by multiplying the formula $D(D - 1)/2$ (which assumes the value 0.40 for the air-standard efficiency) by the factor $2.5 E$, where E is the value of the air-standard efficiency corresponding to the actual compression-ratio of the engine. If the stroke and compression do not satisfy the relation assumed, it is easy to calculate the appropriate value of A . but no account should be taken of it in the rating formula, provided that the compression-ratio is allowed for by the factor E . Any advantage gained in efficiency by improved form of combustion chamber or ratio of stroke to bore, may be fairly credited to the engine, and, *per contra*, any loss due to excessive shortness of stroke, or bad arrangement of valves, is a fair penalty.

If, on the other hand, the value of the compression-ratio is unknown, and it is desired to allow for the probable effect of the ratio of stroke to bore on the efficiency, assuming a standard value of the compression-ratio, the effect may easily be estimated by considering the variation of the coefficient A . If $A = 1$, when $E = 0.40$ and $L = D$, the variation may most conveniently be expressed, in the case of petrol motors, in terms of the excess $X = L - D$ of the stroke over the bore. We thus obtain $A = 1 - 0.5 X/L$, approximately. If this is substituted in place of 1 in the formula $D(D-1)/2$, we obtain,

P.C. rating corrected for stroke, $D(D-1)/2 + XD/4L$.

In the case of petrol motors, X is very seldom so much as a quarter of L , and the added term $XD/4L$ amounts to only 4%, in this extreme case, for a motor of 4 inches bore. Since the value of this correction is somewhat uncertain, if the compression-ratio is supposed unknown, it might fairly be neglected. But in preference to neglecting it entirely, I have generally taken it as $X/6$, being the average value of the correction between $L = D$ and $L = 2D$, and have included it in the correction given below for piston-speed. The probable error will not exceed 1%.

Variation of Piston Speed with Ratio of Bore to Stroke.

It is generally admitted that increase of stroke for a given bore means increase of available piston speed, and that this effect ought to be included in the rating formula. On simple theoretical grounds, I have independently arrived at a formula which appears to satisfy the necessary conditions. Assuming the mass of the piston and connecting rod for a given bore to vary as $(1 + L/nD)$, where n is a constant for a given design, representing roughly the ratio of the weight of the piston to that of the connecting rod when $L = D$, it follows immediately that, for a given maximum intensity of stress in the connecting rod due to the inertia of the reciprocating parts, the piston speed should vary as the square root of the ratio $(n+1)L/(nD+L)$. The possible variation of piston speed according to this formula is comparatively little affected by variations in design. The majority of designs appear to be included between the limits $n=2$ and $n=3$. Between the limits $n=2$ and $n=3$, the variation given by the theoretical formula follows remarkably nearly that given by the cube root of the ratio L/D . But since square roots and cube roots are troublesome to deal with, I have adopted a different type of formula, which is easier to apply, especially in the case of petrol motors where the bore is nearly equal to the stroke. If the excess of stroke over bore, namely $L - D$, be represented by X , being negative when the stroke is less than the bore, the variation of piston speed is approximately

Piston Speed = 1,000 $(1 + X/(2D + L))$ feet per min.

Hill Climb or Speed Test Rating (Power Rating).

In order to correct the rating for the probable variation of piston speed with stroke ratio, it is only necessary to multiply the P.C. rating by the factor $1 + X/(2D + L)$. This correction should not be applied in fuel-consumption trials, because the consumption already takes account of piston speed. But it is required in hill-climbing competitions or speed tests, in comparing the performances of different engines. In the case of petrol motors, where the stroke is nearly equal to the bore, a further simplification may be effected. Since X is small, the factor for piston speed is nearly equal to $1 + X/3D$. Multiplying the P.C. rating $D(D-1)/2$ by this factor, and adding $X/6$ to allow for the effect of excess of stroke over bore on the efficiency, as explained in section 13, we thus obtain the simple formula,

Hill-Climbing Rating = $D(D-1)/2 + XD/6$. (H.C.)

The approximate formula H.C. is not intended to apply for large variations in the stroke ratio. It gives a rating 4.0 B.H.P. for an engine 3×5 , where the complete expression, adding the term $X/6$ for improvement in economy, and allowing the fraction $X/(2D + L)$ for piston speed, would give 3.9 B.H.P. Within these limits the formula is close enough for practical

purposes. But applied to an engine 3×9 it would give 6 B.H.P. where complete expression gives 4.9 B.H.P.

Relation of Power to Weight.

The formula here proposed to represent the effect of size has an important bearing on the question of minimum weight in relation to power. Assuming that power varies as the square of the linear dimensions, it would follow that the ratio of power to weight varies inversely as the linear dimensions, and would increase indefinitely as the size is reduced. If we assume instead that the power varies as $D(D-1)$ for similar engines, the ratio of weight to power reaches a minimum at two inches, and increases far more slowly with bore than in simple proportion to the linear dimensions.

Another important consideration affecting the weight ratio is the compression. If we assume that the maximum pressure is nearly proportional to the compression pressure, and that the strength and weight of the motor and its gear must be proportional to the maximum stress, we may take the compression pressure as a measure of the weight. Taking the air-standard efficiency E as a measure of the mean pressure and the power, we find that the weight/power-ratio is nearly twice as great for a compression-ratio 5 as for a compression-ratio 2, and diminishes with diminution of compression-ratio, reaching a minimum at $r = 1.9$ if $r = 1.40$. The best value of the compression ratio depends on various conditions, but chiefly on the ratio of the load carried to the weight of the motor and its accessory gear. If the load is equal to the weight of the motor, the compression-ratio should be rather less than 3. If the load is double the weight of the motor, the compression should be about 4.5. The above shows that in many cases where weight-saving is a primary consideration it may be desirable to reduce the compression considerably, and that even in automobiles there is no great advantage in increasing the compression-ratio beyond 4.0, provided that lightness and smoothness of running are considered.

Summary of Formulæ.

It will be evident from the previous discussion that no single rating formula can be applied universally. The factors of which account is to be taken, and the data available for comparison, will differ in different cases. Any proposed formula should be capable of modification to suit the requirements of the case to which it is to be applied. I have, therefore, endeavored to show how the formula should be modified to take account of different factors. Assuming that the primary object of a rating formula is to encourage efficiency irrespective of size, the necessary effect of size on the efficiency should always be allowed for in comparing similar engines of different sizes. This is represented by the factor $(1 - 1/D)$, but between the limits 3" and 6" bore the cube root of the diameter may be taken with an appropriate change in the constant. The piston speed may be taken to vary as the factor $1 + X/(2D + L)$, or as the cube root of the ratio L/D . This factor should be employed for power-rating in competitions, but not for estimating power in terms of consumption.

The formulæ are here summarized with reference to the factors of which account is taken in each.

$D =$ bore, $L =$ stroke, $X = L - D$, all measured in inches.

$E =$ Air-standard efficiency = $1 - (1/r)^{\gamma}$, where $r =$ compression ratio.

Efficiency rating. (P.C.)

Bore only, $D(D-1)/2$, or $D^3 \sqrt[3]{D/4.3}$.

Bore and stroke, $D(D-1)/2 + X/6$.

Compression and bore, $2.5E D(D-1)/2$.

Piston speed.

Piston speed = 1,000 $(1 + X/(2D + L))$, = 1,000 $\sqrt[3]{L/D}$.

Power rating. (H.C.)

Bore and piston speed, $(2D + L) (D-1)/6$, or $D^3 \sqrt[3]{L/4.3}$.

Bore, stroke, and speed, $D(L + 2D - 3)/6$,

or $D(D-1)/2 + XD/6$.

The formulæ may be multiplied by $2.5E$ to allow for compression, and by the number of cylinders in multicylinder engines.

LETTERS INTERESTING AND INSTRUCTIVE

How Can This Backfiring Be Cured?

Editor THE AUTOMOBILE:

[779].—Here is a case of back firing into the carbureter, for which, if you can give a reason and remedy, I would be much obliged. I have a Columbia light touring car, with double opposed motor, which gives very good satisfaction, except that at high speeds there is this constant popping and snapping from the carbureter explosions. The motor is very satisfactory except at high speeds.

I have lately had the valves all reground and properly timed. I am also sure that there are no short-circuits in the electrical system. The carbureter is fitted with a dash-pot, with a piston, which when raised by extra suction of fast running admits more air to the mixing chamber. This carbureter is about three inches nearer one cylinder than the other.

The only adjustment possible in this carbureter is that of the dash-pot valve, which can be arranged so that the piston uncovers the auxiliary air valves to a greater or less extent. This I have readjusted in various ways, but it does not correct the difficulty, and I have also seen that the carbureter is clean and all passages free. I would be very much obliged if you would answer this through the columns of "The Automobile."

New York City.

J. C. MOORE.

From your statement in the case, we should judge the trouble you mention arose from some constitutional defect of the carbureter itself, as was the case with not a few of the old types of carbureters. However, that was before the day of the auxiliary air valve and the general adoption of the latter in one form or another seemed to have done away with this more or less common fault of earlier days, as it is rare to come across an instance of this kind now. We have seen numerous explanations of the trouble advanced but have never come across any that we thought satisfactory, apart from those involving exterior causes, such as leaking or improperly timed valves, which you mention do not exist in your case. Assuming that this has been done and that the motor is in good condition otherwise, also that no amount of carbureter adjustment has sufficed to remedy the trouble, we are at a loss to offer any suggestion of definite value, but there are doubtless a number of our readers who have gone through similar experiences in past times and they may be able to shed a little more light on the matter. We should think the makers would also be in a position to do this, as they were doubtless familiar with this difficulty in days gone by.

Neutralizing Exhaust Gases in a Closed Room.

Editor THE AUTOMOBILE:

[780].—I wish to arrange some device which I can keep in my garage which will neutralize or absorb the burnt gas from the motor—so as not to poison the air. Conditions are such that I cannot run the gas out of doors. Can you give me any suggestions as to how to accomplish this?

Denver, Col.

CHAS. A. SCOTT.

We do not know of any device that would accomplish the purpose you require. The process would naturally have to consist of the conversion of the carbonic acid and other gases contained in the exhaust of the motor into oxygen and hydrogen, and there is little doubt but that the cost of the apparatus necessary to do this would greatly exceed that of your entire garage. We should recommend not running the motor in the garage for any length of time. When necessary to run the motor to make adjustments take the car out in the street, if there is no other place available. The only other method would be ventilation, which you state is not possible under the circumstances, though we cannot conceive of a situation that makes clearing out of the noxious gases by natural means out of the question, particularly in a private garage. Not having the situation of your garage before us, it is impossible to make any suggestions of definite value concerning the remedy you are seeking, but regard the installation of any independent device impracticable and would not recommend it.

A Rather Bad Case of Overheating.

Editor THE AUTOMOBILE:

[781].—I am quite a diligent reader of your correspondence columns on motor problems, but I do not remember seeing anything that would solve the little problem which confronts me now. I have a four-cylinder, air-cooled motor, 4x4 bore and stroke, driving a light-weight touring car through planetary transmission. It is, in fact, a 1905 model of the Marlon car, made in Indianapolis, and the whole car has stood up to its work and given excellent service. The problem is now one of proper cooling. No fan is used, the cooling being simply by means of flanges, which are shallow around the cylinder and quite deep about the valve cages. The first year and a half or more the motor did not overheat except under strenuous conditions, but now even a little work on low speed is apt to make it too hot to give maximum efficiency in power.

The exhaust valves were reground last fall, and the car has not been used much since. The commutator seems in good condition, and my storage battery gives ample current; in fact, the ignition part of the engine has been thoroughly gone over very recently. The carbureter, which is of the very simple old style Kingston type, is adjusted to give almost maximum air and minimum fuel without missing, which I have found gives me the greatest efficiency in the long run without overheating. I have tested the compression with a compressometer, which screws into the spark plug holes, and find a low compression with a maximum variation of only two pounds, i.e., the compression runs 25, 26, 27, 26. Doubtless the compression is higher when the engine is warmed up and a film of oil worked into the piston, since this compression was ascertained when the engine was comparatively cool and tested by jerking the starting-handle as rapidly as possible, in order to give as quick a stroke as possible, opening all the petcocks except the one in the cylinder on trial.

After experimenting with oils, I have found that the oil of heavy body and high test is the best for this engine, which uses the splash system. I am convinced that the oil is not at fault, and that the opening and timing of inlet exhaust valves are pretty nearly all right. At first I thought I was running with too rich a mixture, but having changed this, I find the engine still overheats, although not so much. There is a good deal of rust on the outside of the cylinders, but I do not see how this could affect the motor. Do you think that the needle in the spray nozzle of the carbureter has become worn, and would this have any effect with the proper adjustment? When last examined the carbureter seemed to be all right, and has given me less trouble than any other part of the engine.

Knowing what excellent work the engine is capable of, when I toured with it in Illinois and Indiana on hot summer days, and knowing that no part of it has given way or worn out, I am at a loss to account for this overheating. I shall be grateful for any suggestions you may see fit to offer.

Will say further that I frequently prime the cylinders with kerosene to keep them free from carbon, and there does not seem to be any preignition from this cause, although after stopping, if I remove the switch-plug without shutting the throttle, the mixture will explode in the cylinders with an evil odor at the exhaust. Tops of pistons were scraped clean last fall. The car has not been run all told more than 5,500 or 6,500 miles at the most.

St. Louis, Mo.

JOHN GULLY COLE.

It would appear from your statement of the case that the trouble would probably be found to lie in both the carburetion and the ignition. Doubtless too rich a mixture is being used as this tends to overheat an air-cooled motor very badly, owing to the fact that it is very slow-burning and the spent charge issues through the exhaust in a practically incandescent state. Similar conditions in a water-cooled motor would require frequent refilling of the tank to replace the water boiled away. If the carbureter now fitted to the motor cannot be adjusted properly to overcome this objection, it would doubtless be found a good investment to replace it with one of more modern type. The ignition may be contributing to the overheating very materially by delaying the occurrence of the spark to such an extent that the result is the same as that caused by the overrich mixture. That is, the explosion does not take place until the piston has traveled a considerable portion of its downward stroke, thus causing the charge to do most of its burning on its way

out through the exhaust. This naturally causes a great loss of power and is a frequent and unsuspected cause of overheating. Efficient working of an air-cooled motor is dependent to an extent seldom realized by the average autoist, upon the explosion of the charge at exactly the proper moment and in the minimum time, so that the heat developed has as little opportunity as possible to be absorbed by the cylinder walls and valves. In other words, the greatest heat must be developed, its expansive power utilized and the great portion necessarily wasted gotten rid of, all in the shortest possible time. Examine the timer and coil adjustments very closely and see if they are not at fault; their condition may be such that while the position of the spark lever on the steering wheel would give the impression that the car is being run with the spark well advanced, the reverse is the case. An air-cooled motor should always be run with the spark advanced as much as possible, short of the point where knocking occurs. Rust is far from being a good conductor of heat and if the outside of the cylinders is badly rusted, we should certainly recommend that it be removed, although it may not contribute, except in slight measure, to the overheating complained of. The lubrication should be looked after carefully and kerosene injections resorted to more sparingly. Having given good service for such a period, it is certain that the overheating is not due to faulty design, as the trouble would then have appeared earlier. We think a thorough investigation along the lines indicated should provide a remedy and would be pleased to learn of the outcome.

No Benefit from Increasing Spark Beyond Certain Point.

Editor THE AUTOMOBILE:

[782].—I have been much interested in the letters and inquiries which have appeared in your valuable journal from time to time, particularly with reference to matters of ignition. During the four years of my experience as an owner and driver of motor cars, I have been able to trace 75 per cent. of my troubles directly to faulty or defective ignition.

It always occurred to me that the spark usually employed to fire the charge was entirely too small in volume and force to give the engine its greatest efficiency; and recently I had the opportunity of testing the correctness of this theory. Driving with a friend in a car equipped with both storage battery and high tension magneto, the difference in power and speed was remarkable when running on the magneto, and it probably increased the efficiency of the motor no less than 20 per cent.

But many of us having good motors not thus equipped cannot afford to pay out \$150 for a high tension magneto; and in seeking for a way to better my ignition system, I have thought of installing a single coil rated as giving a 2 to 3-inch spark, using a secondary distributor, and supplying the current with a storage battery of 8 volts and 120 ampere hours. In theory, such a coil and system should give eight to ten times the spark given by ordinary coils, and should very nearly approach the force and volume of spark given by the magneto; but whether it will do so in actual practice, I am unable to determine.

An answer to the question presented above will not only oblige the writer, but might prove interesting to the many thousands who, like myself, find their subscription of your journal a source of both pleasure and profit.

Galveston, Tex.

GEO. G. CLOUGH.

We have always been of the opinion that the theory that you hold is erroneous and arc borne out by extensive and numerous investigations, some of them made with painstaking care to ascertain exactly the effect of increasing the spark on the running and the amount of power developed. As both the laboratory and road experiments have led to the same conclusion we think that there can be little doubt but that beyond a certain point, no advantage whatever results from increasing the size or heat of the spark. However, there appears to be considerable misunderstanding on the point where the average autoist is concerned. It follows naturally that if the amount of current is so small that it does not produce sufficient spark to ignite the mixture, increasing it will do so, and if this increase be just enough to fire the charge under the most favorable circumstances, increasing it still further will certainly give it a greater factor of safety and consequently insure more certain firing under changing conditions.

But having increased it to a point where it is capable of firing the mixture under average running conditions, whether these be better or worse, the question becomes, Will it pay to increase it still further? We do not believe so and would not recommend your installing such a powerful coil as you mention. It would be a waste of money and would consume current much faster than you would care to supply it. Your idea that the magneto gives a spark of greater volume and that this accounts for the improved running is not correct. We have had the same experience as that mentioned by you, as far back as 1902, when we found it possible to easily get ten miles more an hour out of a car with magneto ignition than with a battery. We think the greater precision with which the timing is controlled and the fact that the magneto spark becomes stronger as the motor speeds up is accountable for the better service, for, as a matter of fact, it is possible to obtain a spark of much greater volume with a set of accumulators and a coil than with a magneto for obvious reasons. The letter of A. A. Kent, in this issue, is appropos. In it he says: "—nevertheless, after a certain spark heat has been obtained, an increase in the heat will fire the engine no better." For the most exhaustive and complete investigation of the subject that appears to have been made we would refer you to the issue of THE AUTOMOBILE of March 21, 1907, containing an article by W. Watson, D.Sc., F.R.S. We think that probably an overhauling of the ignition system of your car, paying particular attention to the timer as well as the current consumption at the coils would result in improvement, though you naturally cannot expect to equal the results obtainable with a modern magneto.

SUBSTANTIATING MR. JACKSON ON DRY CELLS.

Editor THE AUTOMOBILE:

[783].—Let me first quote from the article of Arthur F. Jackson, in your issue of May 23, as follows:

First—"Dry cells, when properly used, furnish the best ignition. The cheapest, cleanest and safest."

Second—"Many are under the impression that excess of voltage is injurious to coils, but that any ampere rate of current may be used without harm."

The first statement is a very broad one, and while my knowledge of magnetos, etc., is very limited, I want to heartily indorse the statement so far as it refers to wet or storage batteries, and in hope it will help some brother who is searching for good ignition and debating whether or not to spend good money for a storage battery. I want to distinctly state that I gave away my last storage battery, and it was in good condition and of a very well-known make, and I am now relying with perfect comfort and satisfaction on small dry batteries.

These are my reasons: About a year and a half ago I bought a small four-cylinder car of a good make, second-hand. It had in it two storage batteries of four volt 60-ampere hour capacity each. I was given to understand that these cells should be recharged every month or six weeks, whether used or not, so about every three weeks I would take first one and then the other to be charged, and must honestly say I never had any ignition trouble that I could lay to these cells other than the trouble of taking them to be charged, going after them, and paying each time the price of three dry cells, viz., 75 cents.

Being told that I would get more power if I had six volt cells instead of four volt, I decided to find out for myself, arranging my wiring so that with my switch one side I got four volts and on the other side took both batteries in series, getting eight volts. I took a day's run in the country. Using first four then eight volts failed to show any appreciable difference, so I decided not to waste any money changing my batteries for those of six volts.

Last July I sold that car, and when selling it took out one of the wet batteries and replaced it with dry, feeling that it was fair to the purchaser and keeping the one to put in a new car. I purchased a new car of the same make. It had in it 16 small dry cells in series of fours, wired up in two sets of eight, each connected in series-multiple, each set of eight constituting a complete battery connected to one side of the switch. This, as I understood it, would give about six volts from fresh batteries of four volts after some service. I decided at once to give these batteries a fair trial and see what they would do in the way of service, and being told that the double fours to a very great extent avoided the necessity of shifting from one set to the other, I simply ran on the right-hand set until they gave out, and the result was that I ran from about

July 25 until the middle of October, covering over 2,300 miles before the first eight cells gave out. A pretty good record.

Then, wasting no time with ampere meters, I simply threw out these eight cells and put in eight new ones and began to run steadily on the original left-hand set of eight. These carried me until February, when they gave out, partly, I believe, from age, as I did not double my first mileage.

However, I then commenced on my third set, and to-day, with 4,400 miles up, they are still running strong.

I feel very positive of getting from 1,500 to 2,000 miles on every set of eight cells, and in ten months have used up \$4 worth of dry cells, with \$2 worth now in service and partly used up. I have had no battery troubles whatever, and, personally, do not want any storage batteries which would have cost considerably more for recharging, to say nothing of original cost, depreciation, and the trouble of having recharged frequently. Buy fresh cells, be sure your wiring is good in every way, and do not waste time with ampere meters which damage dry cells, hook your cells up in double sets, and you won't have any trouble with the much-abused but very good dry cells.

As I said above, I gave away the storage battery which had been saved from my first car.

Mr. Jackson's second statement hits me very hard, for I certainly was one of the "many." I firmly believed that with low voltage, say not to exceed six, no matter what the amperage, there was no chance for damage to a coil, and I would like very much to read in your valuable paper some further articles on this subject.

New York City. GASOLINE SAL.

RESULTS OF EXTENSIVE IGNITION EXPERIMENTS. Editor THE AUTOMOBILE:

[784.]—I have read with a great deal of interest the articles published regarding the necessity pro and con of a hot spark against a weak spark for igniting gas, and notice in your answer to letter No. 766, from Charles E. Duryea, that you would like to hear other opinions regarding this question. I have a long time refrained from entering my opinion in regard to this, as I did not wish it misconstrued as advertising the ignition system which I have had on the market for the past two years.

However, as this system has so many differences from other systems with which trials have been made and eliminates several points which have made experiments with others somewhat questionable, my experiments may throw some light on the subject.

I use entirely jump-spark produced from non-vibrating coil. The primary circuit made and broken by mechanism driven synchronously with the engine and the secondary current is distributed to the cylinders of the engine. The mechanism by which I made the primary contact will not vary the time of the spark by variation of the contact adjustment. Neither will the strength of the battery have any effect upon the timing of the spark, as is the case with the magnetic vibrator coil where a weak battery is liable to retard the spark or a light adjustment of the vibrator advances the spark, therefore as I am practically positive regarding the timing, I am able to deduct results on the size of the spark.

By thermometer experiments in my laboratory I have shown that a spark at low temperature can be produced by low primary battery voltage of four and a half volts and a spark of many times that temperature can be produced by high battery voltage of fifteen or sixteen and a half volts. I am also able to vary the size of the spark without varying the timing of the motor by an adjustment in the contact maker.

Although my experiments have never been performed with an engine on a test block, tests have been made with a large number of makes of cars on the road. I have invariably found that a low voltage and a light adjustment which produces a weak spark will not fire an engine as powerfully as will a stronger spark; nevertheless, after a certain spark heat has been obtained an increase in the heat will fire the engine no better. This limit varies greatly with different engines and carbureter adjustments.

I draw my conclusions from my own personal experience on over 150 cars of between 30 and 35 different makes, so possibly these results may assist others in their deductions. A. A. KENT.

Philadelphia, Pa.

AN OPINION ON SOLID TIRES FOR SMALL CARS. Editor THE AUTOMOBILE:

[785.]—I have read considerable discussion in your paper on the question of solid tires for automobiles, and they all appear to come either from some doctor, or else from a solid tire maker. I believe that all the doctors almost in their practice use small runabouts of light weight and run on city streets that are paved, where the surface is smooth, and I believe that under such conditions solid tires might give fair service.

As one who can speak from having (country) experience, however, I must say there is another side to it. Two years ago, knowing the faults of the pneumatic tire, and attracted by the literature of a

solid tire manufacturer, I was induced to invest in a set of them and have them applied to my wheels. Now as to the locality where they have been used, I will say that I live where there are quite a number of hills, and some rock on those points; we have no macadam roads and the land is a heavy black soil with very little sand, and, in consequence, our roads are very hard when dry, and have many little bumps or raises even when the ground is worn smooth on the surface.

This makes a road that creates considerable vibration on the springs, even when running at a low speed, say, of 12 miles per hour, and, while the cars that have been using pneumatic tires here have no trouble in making 20 miles per hour, a solid tire will rack a car to pieces at that speed, as it finds and transmits to the springs every little inequality of the road's surface, and while a pneumatic tire will give and roll over a little bump with but slight rise to the axle, a solid tire does not, every claim of the manufacturer to the contrary. Further, solid tires have a side-swaying tendency that gives them the most of the resiliency they possess, and this very side motion makes them very hard to guide and have a tendency to skid off to the side into the ditch whenever you get on a place like the side of a grade.

Now as to my own experience, I have a two-seated touring car with 10-horsepower engine and which weighs, complete, with gasoline, water, and full equipment of tools, exactly 1,800 pounds and which is geared to make only 24 miles per hour at biggest speed. Further, I had it fitted with very resilient full elliptical springs when I had the solid tires applied, and yet in the two years that we have used them I have broken two rear axles and three front steering knuckles. After the first one broke, at no time has the car been run at over 15 miles per hour. I don't dare to. In the two years I have not run it over 1,500 miles, and yet the tires have cut worse than pneumatics doing more work than I do; and I find that whenever a piece gets started to cut out, it either cuts out there very fast, or else the tire breaks square across clear to the bottom. I feel that I have given them a good trial, and I am done with them, and would be glad to sell them for half price.

Cedar Point, Kan.

SOL WILLIAMS.

A SUGGESTION THAT MAY AID No. 767.

Editor THE AUTOMOBILE:

[786.]—In regard to the complaint of No. 767 and your suggestions to same, would say that I am having the same trouble with a four-cylinder car. In my case the trouble is exactly the reverse of your explanation and is due to practically a flooding of the carbureter producing a mixture too rich for explosion. When I succeed in lowering the level of the gasoline in the float chamber so that it is where it should be, just at or a trifle above the opening controlled by the needle valve, the engine starts with a quarter turn. If car is left standing with gasoline turned on, the float chamber gradually fills until the gasoline is almost level with top of float. When this happens, it is impossible to start the engine, hot or cold, until the level of gasoline is reduced to where it should be. When priming and allowing the gasoline to evaporize by waiting a few seconds, before cranking, will start the engine. After it is once started, it runs all right because it uses the gasoline as fast as it comes. Further, if this is the cause of No. 767's trouble, he will find the plugs apt to be sooty and that opening the throttle wide will stop the engine instead of increasing speed. I corrected my trouble of this kind temporarily by putting two or three small corks under the float (loose) the added lifting power of which was sufficient to cause the float to cut off the gasoline flow at the proper level. Then, an added precaution until I get a float which will do its work properly without assistance from foreign bodies in the carbureter, is to cut off the gasoline flow at the petcock before stopping the engine. By so doing, the float chamber does not have the opportunity to fill up slowly when car is standing with engine stopped and I am able to start always by opening petcock and cranking immediately. I shall be glad if this chance to be of any service to you or Mr. 767.

Summit, N. J.

ELIOT GORTON.

BUICK GETS SECOND INSTEAD OF THIRD.

Editor THE AUTOMOBILE:

[787.]—With fairness due to the Buick, I think you should be advised that a protest which I lodged at Wilkes-Barre, Pa., against a special Maxwell racer, on the grounds that it was not a stock car, has been allowed by Referee C. B. Roberts, this giving the Buick second place instead of third, the winning Maxwell making the hill in 3:07, and the special Maxwell racer making the hill in 2:47 having been thrown out.

It is quite possible that you did not get this information, but the facts above are true, the referee having awarded us second prize, which we now have in our possession. We will therefore ask you to place the Buick as second in the \$1,000 event to the winning Maxwell.

H. J. KOEHLER.

Newark, N. J.



MODEL C, THE SIX-PASSENGER, 40-HORSEPOWER TOURING CAR.

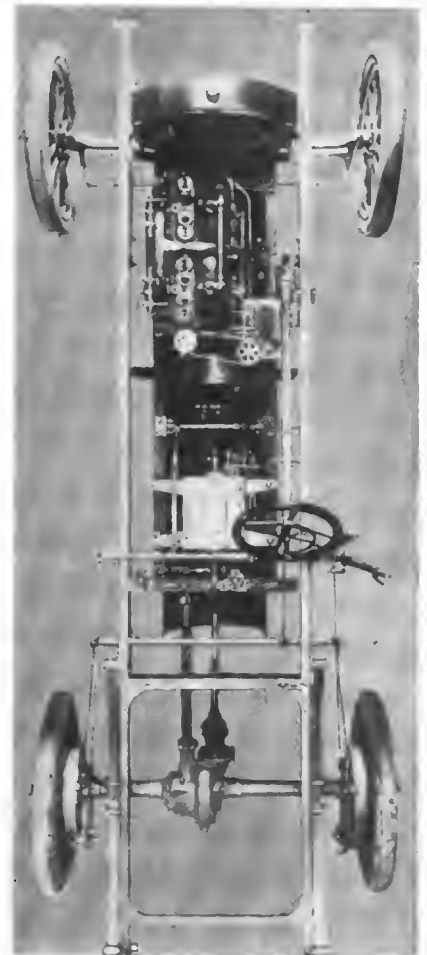
CONNECTICUT is coming along as an automobile-building State, having recently received another addition in the shape of the Continental Manufacturing Company, located in New Haven, which is an outgrowth of the University Garage Company, long well-known in the college town. The company was formally incorporated on March 1 of the present year with a capital of \$100,000, and will devote its energies to the construction of the Continental car of foreign design, three models of which are now being placed on the market.

Model C will doubtless be the mainstay of the line, as it is a standard 40-horsepower six-passenger touring car of the generally accepted type. The remaining members of the trio are Model A, a physician's three-seated runabout, equipped with a four-cylinder 35-horsepower motor, and Model B, a semi-racing touring runabout on the same chassis.

The motor design of the touring car is characterized by the use of independent cylinder castings, the dimensions being 4½-inch bore by 5-inch stroke, the valves all being placed on one side and operated from a single camshaft. The latter is also true of the runabout model except that the cylinders are cast in pairs, in other respects the designer having paid particular attention to the simplification of the power plant and chassis in order to facilitate manufacturing, so that on the whole the three models are built along the same general lines, which have been taken from those found so successful in foreign practice. Special gray iron is used in the cylinders and the latter are ground and polished, the connecting rods, valves and gears being made of nickel steel, oil-hardened and ground to finish. Throughout, the details of the design of the motor, as well as that of its essentials of carburetion and ignition, standard and well-settled practice has been adhered to, the makers not attempting to introduce any revolutionary ideas or innovations.

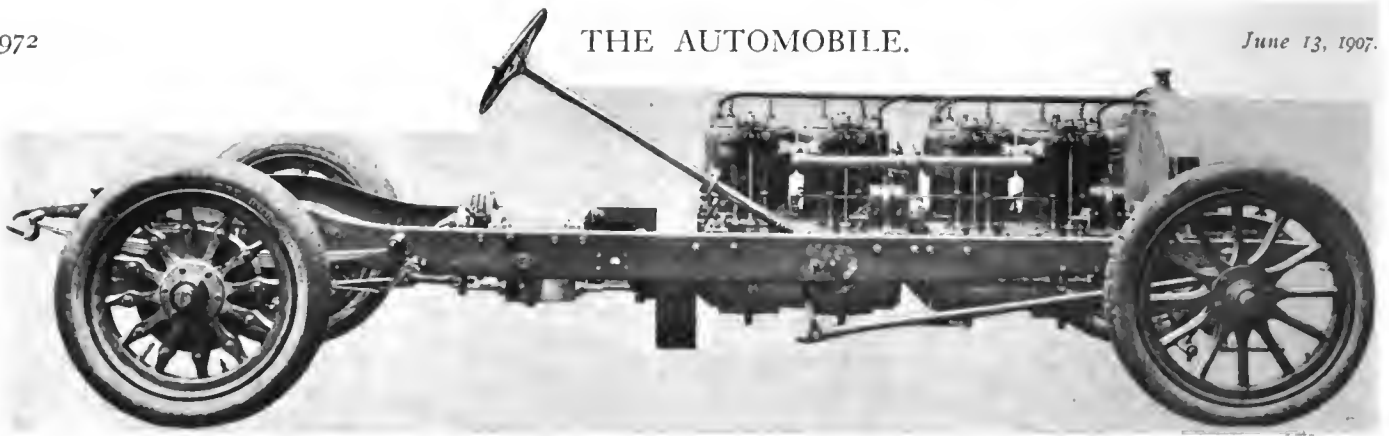
The clutch is of the multiple ring type, consisting of five members, two of which are fitted with cork inserts, while the next step in the transmission of the power consists of a sliding type of gear-set with selective operation, all the pinions being oil-hardened and having their teeth cut with special beveled faces to facilitate the ready engagement of the pinions as well as to make them silent-running. Final drive is by propeller shaft, particularly designed to run in practically a horizontal plane with the car carrying a normal load, attention also having been paid to the matter of ample clearance, 10 inches in the clear being allowed, in which respect foreign standards have been radically departed from in order to adapt the car to American roads. In each model the weight has been centered well between the axles, the motor being placed to the rear of the front axle and the back seats of the tonneau not being extended beyond the rear axle, the latter being an objectionable feature of some American cars that can only be appreciated on trial over a rough road.

equipped with a straight line body of the accepted foreign type; it has ample seating capacity for six passengers with plenty of storage room for baggage under both the front and rear seats. The runabout body is of special design, the body being placed much further back with a recessed type of dash, considerably lower than is the case on the touring car, in order to blend with the lines of the remainder of the car. The seats are also somewhat lower and side doors are provided at the dash on both the runabout types, the physician's car complete, with top, making a most attractive and business-like appearance. A rumble seat is provided, giving a seating capacity of three people, and provision is made for the stowing of a trunk under the chauffeur's seat. Control is by means of the usual small spark and throttle levers mounted on top of the steering column on a stationary sector, while for city driving an accelerator pedal is provided, in addition to a handy muffler cut-out. A somewhat novel innovation in the way of driving control is found in the single pedal acting on both the clutch and the running brake, while a second pedal controls a powerful double brake, in addition to the unusual emergency brake operated by means of a side lever. The factory in which these cars are being turned out has recently been completed, and comprises an L-shaped building running 200 feet east on Olive street and 200 feet south on St. John street, New Haven, each wing being 65 feet wide. It is three stories high and is equipped with modern facilities.



CHASSIS OF THE CONTINENTAL.

While all three models are along the same general lines, each has been specially designed for the purpose in view, the Model A, physician's three-seated roadster, having a 25-horsepower motor and a 100-inch wheelbase. It is shod with 34 by 4 inch tires on all four wheels, and tips the scales at 1,900 pounds. The Model B carries a 35-horsepower motor, has a 112-inch wheelbase and the same tire equipment, but its total weight is only 200 pounds greater, or 2,100 all on. The Model C, which is the standard touring car of the trio, has a 40-horsepower motor and a wheelbase of 120 inches. Its total weight is but 2,500 pounds, and it is also equipped with 34 by 4 inch tires. Particular attention has been paid to the matter of body design in every one of the models, the touring car being



ONE OF WEIGEL'S EIGHT-CYLINDER, 80-HORSEPOWER BRITISH FLYERS BUILT FOR GRAND PRIX RACE.

WEIGEL'S BRITISHERS FOR FRENCH AUTO RACE

LIKE the American champion in the Grand Prix of the Automobile Club of France, the two British candidates for victory have a distinct individuality. Partly owing to the late appearance of the regulations and the still later announcement of the date of the race, and partly because of a desire to show the value of their standard construction, the Weigel Company decided to employ two standard four-cylinder engines on a racing chassis. As will be seen from the illustration of the chassis, the two forty-horsepower motors are placed tandem fashion, with special crankshaft and camshaft, the former being over six feet in length. There are only four throws and five bearings to this unique crankshaft, two pistons being connected to each crank-pin, and two cylinders firing together in the order 1-8, 4-5, 2-7, 3-6. Cylinders, which are cast in pairs, are 130 by 140 bore and stroke. Valves are on opposite sides, operated by cams formed solid with the shaft. Standard forty-horsepower crank-chambers are employed, bolted rigidly to two stiff steel strips forming a foundation for the engine, and preventing strain upon the crankshaft through springing of the frame. Both engine and gear-box are mounted direct to the side frame.

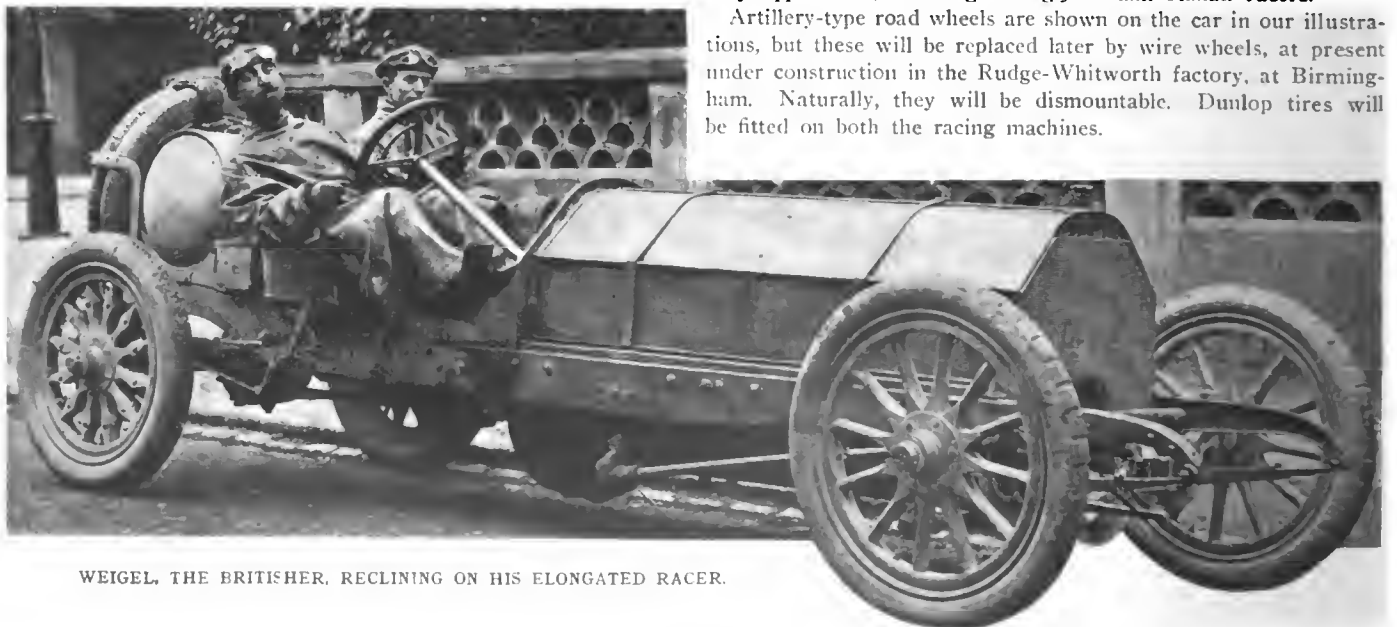
Ignition presents some new features as the result of the grouping of the two engines. It had been intended to construct a special low-tension magneto, with two separate armature windings and two collector brushes. Owing to shortness of the time, however, this had to be abandoned, and two low-tension magnetos of French construction were adopted, driven from spur wheels situated in the center and at the forward end of the inlet valve camshaft. A spur wheel on exhaust camshaft drives the high-tension distributor for the accumulator-fed ignition.

At the present time a single float-feed perpendicular currents carbureter is being employed, placed between the two groups, with induction pipe on the right-hand side passing left and right and entering each pair of cylinders. Experimental work is being carried out, and it is quite possible that in the race the machine will have two distinct carbureters. Tests on fuel consumption have not yet been completed, though the makers declare that it is well within the neighborhood of one gallon per ten miles. It should be noted that the multiplicity of cylinders does not tend toward economical fuel consumption. Even six-cylinder engines are considered to be at a slight disadvantage under the Grand Prix rules, and it is to be feared that the Weigels will be more heavily handicapped than their competitors.

In the transmission there are modifications on the standard type of Weigel machine. A very large fly wheel—unnecessarily large it might be objected—is carried at the rear of the engine. It is somewhat surprising that advantage has not been taken of this special form of construction to place the fly wheel between the two motor groups. The standard multiple disc clutch is fitted, transmitting the power to a special gear-box, giving two-speeds forward and reverse, neither forward speed providing direct drive. Final drive is by cardan shaft and rear live axle of standard touring machine construction.

Naturally, for such a long engine, a special frame has had to be employed. It is of deeply cambered channel section steel, parallel throughout, lined with wood and raised at the rear to clear the back axle. Tubular cross stays are used. The dip of the front axle has been considerably accentuated to get a low-hung body. In general outline the machine has a very pleasing racy appearance, recalling strongly certain Italian racers.

Artillery-type road wheels are shown on the car in our illustrations, but these will be replaced later by wire wheels, at present under construction in the Rudge-Whitworth factory, at Birmingham. Naturally, they will be dismountable. Dunlop tires will be fitted on both the racing machines.



WEIGEL, THE BRITISHER, RECLINING ON HIS ELONGATED RACER.

Smart Effects in Automobile Fashions

By Laura R. Seiple

INCENTIVE towards smart dress for automobiling was never so pronounced; while makers of fashionable toggery were never more encouraged. Society is not content with plain attire as was the case a year ago. Materials employed in many of the handsomest garments are finest imported worsteds, pongees and silk mixtures. Models are as carefully designed as elaborate tailor-mades and headgear is being improved every day. The day of severe motor clothes is past and before many moons we shall hear as much discussion over apparel for the pleasure as the average woman deems necessary for her choicest evening clothes. There was a time not very long ago that little or no interest was given to the fit of the automobile coat; it might be as loose as a cape or as plain as the strictly tailored garment could be made. But now there is a universal cry for fancy effects and the fashionables will not recognize anything short of extravagant materials wrought into the most intricate models, many of which are elaborately trimmed.

Among the novel coats imported for early summer wear is a preponderance of pongee, not the thin, glazy sort, but a heavy, firm texture that insures endurance and is proof against dust. Recently the craze for fitted coats has overtaken society and the woman with a fit figure is sure to include in her automobile outfit one or two of these trig garments. A very charming model is fashioned after the style of a Russian blouse with snug belt and full circular skirt. The collar is rather high and closes with a tab. A panel effect in the front is finished with two rows of fancy buttons set on to give a broad effect, and the full sleeves are finished at the wrist with buttoned-over cuffs to protect the arms. Touches of tobacco brown are introduced in the trimmings appearing on the collar, cuffs and in pipings on the double-breasted front and narrow belt. Such a garment is not only adaptable for automobiling but for driving and traveling.

A rain and dust coat is a valuable possession in summer, whether one owns an automobile or rides in train, carriage or trolley car. One of the fascinating models recently unboxed, is of heavy pongee in its natural color trimmed with brown and tan checked silk, further embellished with pipings of plain brown. This model is loose fitting and differs from other garments cut on similar lines, inasmuch as its elaborate tailoring makes it available for almost any use. The unusual feature about this coat is the novel way in which the panels running from the shoulders to the line below the waist are fashioned. Beginning in the shape of a Gibson shoulder cape they extend down the fronts and curve under the arms, ending in rather good-sized pockets finished with buttons. The high turn-over collar closed with the same fancy bone buttons and the lower parts of the long sleeves echo the treatment both in trimmings and buttons.

Pongee is used in many stylish and inexpensive coats and dresses, but it is sure to look mussy unless in the heavier qualities

that are not made in America. If one does not feel disposed to invest in a fine pongee coat, mohair is next in choice. For actual service there is nothing better, provided the color be excellent in the beginning; if it is not, the result after the first long run in the sun is discouraging; blues and browns suffer most when exposed to strong light, but tans, grays and cream color will give fairly good service if a good quality mohair is used. Some of the most effective garments of this material are in rich plaids. Green and blue combinations are liked by many, while maroons, browns, greens and blues are found in the more elaborate combinations. To return to pongee, it tailors beautifully, keeps its shape well, sheds the dust as no other fabric does and is found in almost any color desired. As a rule, a good wetting will render it unsightly at the seams, which is of course a disadvantage, but if perfectly tailored this disastrous feature can be eliminated by proper staying, sponging and pressing in the beginning.

A good mohair has much to its credit. Some extremely good-looking automobile coats in mohair of excellent quality in soft grays and champagne colors shot with black or white or even green, give splendid service. The majority of these coats are plainly but smartly tailored and without trimming save for stitching and metal or pearl buttons. Now and again one will see the collar and cuffs of plain color corresponding in tone with the accessory color; this is of leather as often as it is of mohair or ribbed silk. There is a strong vogue for checked effects in black and white, brown and white, or with an indistinct thread of bright red or green appearing at distances of several inches apart. A stunning French coat of pongee in that lovely shade of blue known as Copenhagen, is piped with white leather and further embellished with the same material in the form of cut-out figures through which the soft blue appears. Some striking effects are obtained in decided stripes and others less pronounced, but extremely smart in modes having darker stripes and varying widths. The latter combination is, perhaps, the most recent adoption among the new fabrics.

In anticipation of mid-summer motoring, when woolen coats are discarded on short runs, coarse linen of the homespun variety promises to be much to the fore. In appearance and durability the soft, hand-woven linen coat has much to recommend it. Besides being extremely comfortable it is smart when well cut and tailored, and, above all, is washable. Sometimes variation is given to such garments by additional collars and cuffs of velvet, which are detachable. This decoration is seldom if ever found in the ready-made garment, but it is not a difficult matter to have a separate set made to meet the requirement. A practical feature about linen is the dampening and pressing after it has become sadly wrinkled, which treatment renders it like new. If possible, it is always best to have a homespun linen washed and



FITTED COAT OF PONGEE.



COMBINED HOOD, SHIELD, VEIL.

do nicely to slip on over the dainty summer frock with billowy sleeves that would hardly withstand the dragging on and off of a close-fitting wrap, and for short jaunts to a neighbor's lawn party or evening entertainment the kimono coat is ample protection for the occasion. Of these charming little garments there are some stunning effects in tussores, with artistically draped shoulders and loose sleeves ending in points finished with tassels. For this particular use broadcloth in delicate shades is paramount. A charming wrap of this character is in scarlet broadcloth trimmed with gold braid and tassels.

The handsome coats and dresses in supple leather must not be overlooked. Many of these are wonderfully tailored and in lovely colorings, but are practicable only for extended motor runs and for cool weather. A fascinating suit in Russia colored leather is made with gored skirt trimmed with manipulations of leather pipings above the hem which, by the way, is fully five inches from the ground. The trig little coat is semi-fitting with belt to close it as snugly about the waist as one desires. Turned-back cuffs, high collar and flap pockets that button down complete one of the smartest leather costumes brought out this season. A golden-brown crin (horse-hair) hat with extra drop at the back to protect the hair, is cunningly trimmed with rosettes and wings in corresponding color, tipped with green. High boots with Russia leather vamps and suède tops carry out the *tout ensemble*.

As to hats, almost any small shape that will resist the wind and may be comfortable and fetchingly secured to the hair is considered correct. But after all is said and done, there is nothing quite so satisfactory as a big veil arranged over the hat and tied in a coquettish bow at one side, allowing the ends to float in the air. One of the recent arrivals from Paris is an odd little Panama hat, with straight brim and dented crown. The simple trimming consists of a polka dot scarf twisted around the crown and falling over the left side. These ends are so arranged that they may be turned over the top of the hat and tied under the chin when an extra veil is not desired.

Novel effects are always met with enthusiasm, but scarcely has there been such a mad craze for the unusual as the flowered chiffon or crêpe scarfs are creating. Dealers are already beginning to complain of the shortage in the market of these gay head coverings. Some of the handsomest ones are of crinkled crêpe spattered with great bouquets of vivid roses; others are ornate in Persian colorings, while huge polka dots play a leading part among the fancied patterns. Bright red poppies cast among

put through a shrinking process before being made up; this being properly done, there will be no trouble arising from shrinkage after the garment is completed.

One essential point about the motor coat for comfort rather than ostentation is to have collar and cuffs capable of closing snugly. This season designers have introduced a number of picturesque styles devoid of this practical feature, with collarless necks and Japanese sleeves that offer no protection whatever. These

wheat heads and green leaves decorate one of the most daring effects seen in practical use. There are some lovely ones in soft crêpe embroidered with silk in cherry blossoms; others have shattered roses decorating their full length; some in natural colorings, others in self tones.

When it comes to the automobile veil, that answers best all requirements, there is nothing more practical than heavy chiffon shirred on a ring and divided at the back, with long ends crossing and brought forward, where any desired means of securing them may be employed. Of goggles there is little to mention that is new, save for the steel lenses with tiny slits running crosswise. These were first intended for racing purposes, but recently femininity has adopted the unique invention with marked enthusiasm. A photograph of these lenses is shown in the title of this article on the preceding page. At first glance it would seem as though it would be impossible to see through such a small opening as the slits in these steel lenses present, but their close proximity to the eyes makes the radius of vision ample for all necessary purposes.

To briefly summarize, the trend of fashion in automobile apparel, as far as women's garments are concerned, will tax the artistic resources of the art of smart tailoring. So popular has automobiling become that its many devotees demand variety in fashion, and this demand can only be satisfied by designs that are special in character, and which will lend individuality to the wearer.

MOTORCYCLES FOR WOMEN

Some of the foreign papers devoted to outdoor sports sometimes depict women riders of the motorcycle, but on this side of the water the sport has made rather slow progress. A western maker of motorcycles has, however, completed one of these machines for his 15-year-old daughter, and, as she promptly made 65 miles with it over country roads on her first trip, she may be regarded as being to the manner born. The dropping of the frame has naturally brought about some construction problems, which seem to have been well solved. The machine is belt-driven, and in order to avoid the risk of catching the rider's skirts, both wheels have casings.

The maker has also been confronted with a number of other problems in the adaptation of the motorcycle to a woman's use which are more difficult to overcome, at least for the maker himself, for they lie somewhat outside of his province.

They are, in fact, more closely connected with the marketing of the machine, and thus form part of the dealer's duty, and they consist mainly in overcoming the prejudice of the eternal feminine to anything that savors of the mechanical or that requires systematic supervision. It is notorious that a woman never oils a sewing machine nor winds up a watch regularly, so that how to make her realize the pressing necessity of these little attentions in the case of the motorcycle forms a very considerable part of the problem.



DUST AND RAIN PROOF COAT.



LATEST WEIM, FLORAL SCARF.



MEMORIAL DAY AUTOMOBILE PARADE AT SEATTLE, WASH.

SEATTLE'S AUTO CARNIVAL.

SEATTLE, WASH., June 8.—More than 200 cars participated in the Decoration Day parade, which proved the greatest turn-out of the kind ever held in the Pacific Northwest. The weather conditions were ideal, and as Summer weather has been here for some time there was an abundance of flowers with which to decorate the cars.

One of the large Seattle sight-seeing cars headed the parade with a band. The prizes were awarded as follows:

For the best decorated car, Mrs. Josephine North, Oldsmobile; second prize, G. W. Miller, Winton; third prize, Jonathan Gifford, White.

Mrs. M. Baker and Mrs. J. Froom carried off the honors for electrics driven by women. The car was a Babcock.

Mrs. Garrett Fisher took the prize for gasoline cars driven by women, her machine being a two-cylinder Rambler.

H. Grimshaw took the prize for the most novel decoration effect, his scheme being simply a sedate brown dog wearing a pair of goggles.

Society was well represented at the afternoon race meeting, and there were hundreds of cars on the track.

The interesting event of the day was the five-mile, in which the contestants were Capt. Caine's Thomas, with "Chicken" driving; Pacific Coast Auto Company's Pope-Toledo, with Tommy Pillow at the wheel, and W. O. Williams, of Tacoma, Pope-Toledo, with "Slats" Blanchard driving. The Tacoma car fell out after the second mile, owing to something going wrong with the steering gear. Pillow won the race in 6:05 2-5, with a lead of 300 yards. The winning car later made a mile in 1:12 2-5.

The feature of the program on the second day was the ten-mile race for the *Times* cup. F. G. Plummer, driving a Cadillac, won in 12:11 2-5.

Another thriller was a fifty-mile race for touring cars fully equipped. Plummer also won this, driving a Cadillac, and covering the distance in 1 hour 12 minutes. The L. L. Moore cup was the prize in this race.

HOW AN OHIOAN UTILIZES HIS CAR.

Col. Webb Hayes, of Fremont, O., recently struck upon a rather novel use to which he has been putting his automobile on the famous old homestead of ex-President Hayes. Instead of using a large work horse to mow the lawn, he uses his two-cylinder Reo with a 36-inch lawn mower. His car also furnishes the power for a two-horse scraper and a two-horse iron wheeled wagon to haul rubbish, brush, etc., in. Col. Hayes says that the work is done much more rapidly and easily than with horses. When doing the "lawn stunts" he removes the detachable rear seat in his car, which is a trick requiring but a minute's time, and the car becomes the motive factor of the mowing machine.

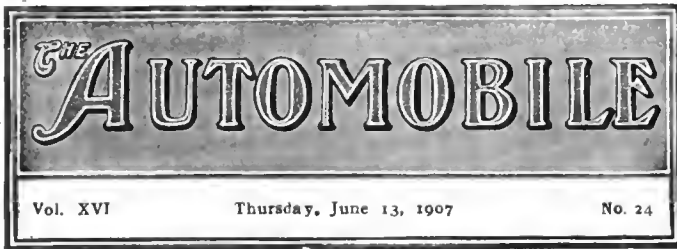
WHITMAN TRIES MOUNTAIN CLIMBING.

L. L. Whitman, the famous transcontinentalist, not content with having snowed under all cross-continental records so deeply that it will probably be years before any attempt is made to better his performance, has a hankering for new fields to conquer and has tried his hand at mountain climbing. The accompanying photograph shows the little air-cooled Franklin at the summit of Mt. Wilson, 6,000 feet above sea level; but that Whitman rather tends to the opinion that mountain-climbing, at least of this variety, is somewhat more hazardous than record-breaking on the level is shown by the following, taken from his letter detailing the performance: "The only road consists of a measly little burro trail that had been widened to permit of taking supplies to the top for a hotel and an observatory being built there. As the reconstructed trail was just wide enough to run a small Franklin car on, R. C. Hamlin and myself were fools enough to want to be the first to drive an automobile up it." Regarding the drive itself, he says:

"On the morning of May 28, at daylight, we hit the trail, and after three hours of strenuous work were at the summit—a ten-mile drive, with a good portion of it soft, mealy road, so that it was a case of low speed all the way, and plenty fast enough for me at that, as we crawled along the side of the mountain and looked down 500 to 1,000 feet right off the end of the hub. Some of the turns were so short that we had to 'see-saw' the corners. Half way up we ran into the clouds, and at the summit we were well above the clouds, with the mountain peaks sticking up out of the vapor like so many rocky islands in the sea. We had three miles of driving through the cloud bank, and the moisture gathered on our clothing to such an extent that we were as wet as if we had been caught in a shower. It was a mighty hazardous trip, but we went very slowly, though the view of some of the dizzy heights, with the tall trees looking like so many tooth-picks on end far, far below, made our hair start a little—on the bald places. As soon as the authorities saw what we were up to they closed the trail against further attempts of a similar nature, but not in time to prevent us making the trip successfully. It was a mighty stiff and difficult climb every foot of the way, and we certainly should not recommend it as a pleasure trip."



WHITMAN'S FRANKLIN CAR ON MT. WILSON'S SUMMIT.



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Great Worth of Road. It is an old, old story—this talk **building to Automobiling.** of good roads and their great worth to a country. France and Britain and other European countries realized the fact centuries ago, with the Romans having been the first to construct highways deserving of the name. Various causes have delayed and interfered with good roads in this country, and, spasmodically, we have accomplished comparatively little except in a few States like New Jersey, Massachusetts, Connecticut, and Rhode Island. Though the one to benefit most, the farmer as a class has been antagonistic rather than favorable to the improvement of the roads, accusing first the cyclers and now the automobilists of working for good highways for their own selfish use, losing sight of the fact that all vehicle owners would have the same opportunity. It may be that the farmer feared that the coming of good roads might—and did, of course—mean increasing cycling's army and consequent annoyance to the owners of horse-drawn vehicles, who seemed to think that the roads belonged to them and there was no call to share with any new conveyance. The same attitude is taken in reference to the automobile except in sections where the farmer himself has become an owner and is comprehending the great boon to him of the motor-driven vehicle.

A man who did conscientious work as commissioner several years ago with the government's Office of Public Road Inquiries was James W. Abbott, who not long since expressed his views in these columns, dwelling particularly upon the results that should follow a national association of all automobile bodies, saying that the time had come for the automobilists to make the roads question their question. But all interests that would be peculiarly benefited by road betterment should have representa-

tion. In the *Pacific Rural Press* of California the Abbott article was reprinted with these comments:

"The policy or statesmanship of Mr. Abbott's suggestion lies in confidence that the automobile is the coming agricultural vehicle and motor. Therefore, though now initiative is needed from other interests, as he suggests, the effort will continually recruit itself from the ranks of agriculturists until what is a most conservative element may become an effective promotive agency."

The various automobile bodies—N. A. A. M., A. L. A. M., A. M. C. M. A., A. A. A., A. C. A., and A. M. L.—are now perfecting an organization, but it certainly seems most advisable to invite the membership of all other associations interested in the building and use of the roads, especially the agricultural element, which should be consulted and be called upon to have a strong voice in the proceedings—or at least have opportunity.



Grade Crossings the Greatest Menace.

Ever since the railroad became a factor in daily life the grade level crossing has taken a constantly increasing toll, and though millions are being spent to eliminate this greatest of all road dangers on steam railways, the trolley has come to complicate the problem so that there has been little actual improvement. Experience has shown that two objects, proceeding toward a common point from different directions, will all too frequently reach it simultaneously, despite their widely varying speeds.

It did not take long to establish this as a fact, and thousands have since been killed in substantiation of it, and still the grade crossing fatality is the greatest of all risks to the autoist as well as the driver of a horse. This being so, it behooves both to exercise the greatest of caution in approaching and crossing such points. The warning to "Stop, Look and Listen" that cost such a large amount of money in Pennsylvania to establish is not a whit too strong. If its admonition were heeded oftener there would be fewer deaths to record. Whether it be danger in this form, a blind turn on a country road, or a long shot at squeezing through a bad place in city traffic, the average autoist is always willing to take chances. It is a specious form of over-confidence born of an intimate knowledge of the great capabilities of the machine, and sooner or later it ends in disaster; most frequently in front of a railroad train. Perfect control and absolute confidence in his machine are two requisites of the good driver, but the autoist who so far abuses them as to take chances at a grade crossing places himself in the same class as the man who rocks the boat and the idiot who "didn't know it was loaded."



South America as a Market for the Automobile.

On few subjects is the average American business man so poorly informed as with regard to the wealth and resources of South America—not future and more or less remote—but actual and present. The man in the street has absorbed the popular notion that, as a whole, the continent that lies to the southeast of us is a measly collection of poverty-stricken republics whose chief, if not only product, is dissension in the shape of frequent-recurring revolutions. Nothing could be further from the reality. It is indeed true of those small sections that form a connecting link between the Mexican border and Colombia, but the area of these countries in the aggregate bears about the same proportion to South America as Rhode Island does to the entire United States.

Brazil, the largest, is considerably greater in area than the United States, and Uruguay, the smallest, represents the equivalent of several good-sized States. Rio de Janeiro and Buenos Ayres are cities of more than a million inhabitants each, and there are numerous others of only slightly lesser importance. That their wealth is proportionate to their size is evident from the number of automobiles already in use. But the majority are of European make and show that the overseas builder has been alive to his opportunities in this direction. It behooves the American maker to do likewise, and the results already gained give some idea of the reward that awaits a live endeavor.

GLIDDEN CARS TO CARRY NAMES ON FLAGS.

Owing to the fact that the touring board of the American Automobile Association has been in receipt of numerous letters asking how cars on the tour are to be distinguished by spectators along the route, it has been found necessary to make a radical departure from the rule prohibiting makers from displaying any form of advertising. This rule remains in force as usual, but as it has come to light that practically every one interested in the tour is likewise interested in some particular make of car and is anxious to know when it passes, the touring board has decided to provide each car with two small pennants, to be placed on each side of the front seats or the dash, bearing the name of the car. By taking this matter in hand neatness and uniformity in the identification marks will be attained and the display of garish and unsightly banners prevented. The pennants will be about three feet long, with the lettering in black or red on a white field, though this detail has not yet been decided upon.

Seven additional entries have been received during the past week, bringing the total thus far up to twenty-seven. Three of the newcomers are touring cars and four are high-powered runabouts, the details of the new entries being as follows:

Car No.	Entrant	Address	Club	Car
19	G. A. Weidely	Indianapolis		24 h.p. Premier
21	T. P. Jones	Pittsburg,	P. A. C.	45 h.p. Pierce Great Arrow
25	A. B. Tucker	New York,	N. Y. M. C.	26 h.p. Dragon
100	A. E. Hughes	Philadelphia		45 h.p. Pierce G. A. Runabout
101	C. A. Coey	Chicago	C. A. C.	60 h.p. Thomas Flyer "
102	H. E. Coffin	Detroit	A. C. of D.	40 h.p. Thomas "Forty" "
103	H. O. Smith	Indianapolis		24 h.p. Premier "

A Newcomer from Michigan for the Tour.

GRAND RAPIDS, MICH., June 10.—Albert E. Meenges, who is building a new car, will enter it in the A. A. A. tour. He hopes to be able to enter two machines, if he can get the second one completed in time.

AUTO DUTIES IN NEW GERMAN TREATY.

WASHINGTON, D. C., June 10.—Under the new commercial agreement entered into with Germany, and which will go into effect on July 1, 1907, remaining in force for one year, the duties to be levied on American motorcycles and automobiles exported to Germany will be as follows: The duty is based solely on the weight, and in the case of motorcycles ranges from 70 marks to 100 marks per 100 kilos, the first figure applying in the case of machines weighing 50 kilos or less, while the last applies to those weighing from 100 to 250 kilos, an intermediate class being taxed 75 marks per 100 kilos. On automobiles the duty is 15 to 40 marks per 100 kilos, and the machines are also divided into three classes: over 1,000 kilos; from 250 to 500 kilos, which pay 25 marks; and from 250 to 500 kilos, paying 40 marks, the mark in each case being figured as the equivalent of 23.8 cents. This forms part of the temporary agreement entered into in order to adjust the commercial relations of the countries until a comprehensive commercial treaty can be agreed upon.

LICENSE SUSPENDED FOR PASSING WRONG SIDE.

BOSTON, June 10.—The first case of the suspension of an operator's license for infraction of the rules of the road occurred when the Highway Commissioners suspended for two weeks the license of John R. McPherson, of Boston, a professional chauffeur. The charge against him was passing a carriage moving in the same direction as the automobile on the right of the road and the right of the vehicle. The Highway Commission has made knowledge of the rules of the road an important requirement in its new chauffeurs' examinations, and it apparently intends to enforce these rules as strictly as the automobile law.

A line of frontier autos is about to be opened between Russia and Germany, both governments consenting, on the Liban to Memel route. The buses carry sixteen passengers, and are of German manufacture.

BLAZING THE WAY FOR THE INVASION.

By GEORGES DUPUY.

MENTON, FRANCE, May 29.—Two thousand miles over the roads of France and Germany, under the blue skies of Italy and around the snow-capped hills of the Tyrol, will soon be the record of the Yankee Stearns. Two hundred kilometers a day is proving a bigger strain on man than on machine, for since coming here the celestial sluice gates have been wide open, and every night finds us soaked in body and spirit. Despite it all, the excellent roads have made motoring not only possible, but have allowed of fast travel.

Out from mountainous Bourg Lastic, where the villagers are still talking of the Pope-Toledo that smashed a farmer's cart before the Gordon Bennett race, to wine-famed Bordeaux, the 248 miles were covered in record time. Down from Bayonne to Biarritz, a distance of 310 kilometers, the Stearns groped along in the inky blackness of night.

In the high mountain villages, where representatives from other lands are not daily visitors, crowds gather around the Stearns night after night and examine it in detail, discussing its self-imposed task and comparing its lines with the more familiar French, German and Italian machines. In the big touring centers the native has a keen appreciation for a good machine, and is showing amazing interest in the forerunner of the Gold Cup party. Those who will join the travelers later will find that the route lies through the most picturesque and interesting spots of Europe that have still the marks of ancient history, not only in the architectural beauties of the place, but in the characteristics of the natives.

To-night, from my attic window overlooking the Allées de Tourney, a good dozen trickling umbrellas are mournfully going up a perpendicular street that leads to a black stone church—but here I stop, at any rate so far as the church is concerned. To-morrow we shall be out on the broad, free highway.

DEALERS CLAIM SELDEN SERVICE INVALID.

Following the action of the upholders of the Selden patent in beginning suit against a number of local dealers handling independent cars, some of the latter have disputed the validity of the service made upon them as agents in law of the makers they represent and made a motion to set aside the service. The motion came up for argument before Justice Hough, sitting in the U. S. Circuit Court on Friday last, the actions being in the name of the Electric Vehicle Company vs. the A. L. Kull Automobile Company, the National Motor Vehicle Company, Homan & Schultz, representing Thomas B. Jeffrey & Co., and others, only the first being reached on the calendar.

Argument in favor of the granting of the motion was made by Frances Rawle, of counsel to the Dragon Automobile Company, Philadelphia, on the ground that the latter and the A. L. Kull Automobile Company were in no way connected other than as buyer and seller, though Mr. Betts, senior counsel to the plaintiffs in the action, stated that it had come to his knowledge that morning that the officers in both companies were the same. His principal contention, however, was that the U. S. Marshal's return could not be traversed on the hearing of a motion—an opinion with which the court was not at all in accord, but consented to direct a reference to hear argument on this technical point of procedure, as well as on the main point of contention.

PARDINGTON ONCE MORE AT THE HELM.

During the absence of Chairman Jefferson DeMont Thompson, of the A. A. A. Racing Board and Vanderbilt Cup Commission, in Europe, the man at the racing helm will be A. R. Pardington, who was the second chairman of the A. A. A. competitive department. While Mr. Pardington is well occupied with Long Island Motor Parkway affairs, it is assured that A. A. A. racing matters will not be neglected. Usually one goes to the busy man to get things done, and that is the case in the present instance.

FOURNIER ON EMPEROR'S RACE.

It is to-day that the elimination trial for the German Emperor's cup will be decided on the Taunus Circuit. On the following day the forty survivors will compete in the final over the same course. So much has been written about the dangerous nature of the Taunus circuit and so much criticism directed against the organization and the recent decision to make the event a two-day race, that it is interesting to hear the views of an impartial contestant.

Henry Fournier, who has just returned to the racing game after several years' absence, and who will drive an Itala in the German event, has spent five days on the circuit and has been round it fourteen times. The road, he declares in *Les Sports*, is less dangerous than the Auvergne circuit, but will probably be more perilous on account of the number of cars and the percentage of less experienced drivers.

"The organization is perfect. It is better than anything we have ever seen in France or elsewhere. An enormous amount of work and the expenditure of a few hundred thousand marks—probably half a million—is the whole secret of its success. Already driving licenses and custom formalities can be arranged at the A. C. F., giving the right to pass free into Germany and avoiding all trouble at the frontier. Count Sierpstorff, the organizer of the course, relates that one of the French drivers, Duray, I think, was detained at the frontier. The newspapers heard of it, and next morning there was a telegram from the Emperor to the Automobile Club: 'Are such stupidities possible in Germany? Advise.' Two days later all was settled.

"You are not asked to admire everything that has been done. You are told to go on the circuit, study it closely, search for defects, and report whatever you find to be unsatisfactory. You are then given permission to run on the course. Your number is painted in enormous letters on the front and rear of your machine, you are given the practice regulations, printed in your own language, with the dates of all the country markets and a note asking you to pay close attention to them. You are further informed that after 8 o'clock in the morning it is forbidden to use a racing machine, and at every curve there are large white stones visible for a long distance, leaving room to pass but preventing all speeding. I have often seen these stones rolled into position. Every morning at the same time throughout the 74 miles of the course the stones are placed.

"The policing of the course for practice work is perfect. I have been round fourteen times on an Itala and have not met either a child or a dog. Already the villages are barricaded, leaving a guarded street on each side in which the children can play. An enormous amount of work has been done at the starting point, grandstands being at the foot of a hill giving a view of six kilometers of road. There are certainly better roads and less dangerous ones, but it is certain that a poor car could not win, especially the second day. From one end to the other the surface is good, indeed of such a nature that one might call it a race track. From the starting point to Homburg the road is 32 feet wide. From here to Oberursel it is a series of streets rather than a road, where it would be impossible to pass a rival if he wished to keep you in the rear. Luckily, however, it is only eight miles long. From Koenigstein to Esch the road is good but terribly hilly. Unfortunately the new road avoiding Limburg and Weilburg is exceptionally narrow and winds continuously. On one side is the river, on the other the mountain; not even a grassy bank on which to pass.

"As for the turns, they start at the beginning and continue throughout. From Dornholzhauser to Oberursel nothing but sharp turns. At Koenigstein a sharp turn to the left followed by a steep grade. At Esch is the beginning of a zigzag. It is so dangerous that, paradoxically, it ceases to be dangerous. There are not even 600 yards in a straight line; perhaps not 200. You just jump from one turn to the other, with as much judgment as possible, without any necessity for braking, but continually

cutting out and opening up. For the motors it is terrible. At one spot you run between two high walls of earth and make such a sharp turn that there is not a yard to spare if the car is not taken round perfectly. A little later is a second turn of the same nature, both of them on a grade which has certainly 15 per cent. Some declare that it is 18 per cent., but I would not swear to this. One thing I am sure of, I have never seen anything like it in my life."

FIVE START ON PEKIN-PARIS RUN.

A cable report from Pekin announces that five automobiles left that city on June 10 for Paris on the 9,300-mile endurance trip, which will break all records for length and originality. Two De Dion Bouton touring cars, piloted by Cormier and Collignon, and a Contal tri-car in charge of Pons, represented France. A Spiker was the single Dutch representative, and Prince Borghese carried Italian colors on an Itala. An enthusiastic send-off was given the small party, a French military band speeding them away with gay selections of music, and foreign ministers and residents wishing the bold travelers all possible good luck. Cormier calculates that they will average less than 100 miles a day.

CHRISTIE OFF TO CAPTURE GRAND PRIX.

After a temporary delay on the dockside, owing to the unwillingness of the steamship company to accept Walter Christie's boxed racing automobile, the American champion for honors in the French Grand Prix, to be run on July 2, was hoisted aboard the *Majestic* last Wednesday. Walter Christie, Louis Strang and the front-drive machine will land at Southampton on June 19. The racer will be immediately uncrated, will cross the Channel for Havre by a steamer leaving the same evening, and will travel by road for the Dieppe circuit without delay. Before sailing Walter Christie declared that the machine had been put into thorough racing trim, and that it would not be used for practice work on the course. A touring machine will be employed to enable the driver to become familiar with the circuit.

DARRACQ RACERS FOR GRAND PRIX RACE.

PARIS, June 1.—For the Grand Prix race, to be run next month, the Darracq firm will use last year's machines, modified to suit the new conditions. It is not yet known whether there will be two or three Darracq racers in the contest, the machine recently sold to M. Heriot having been considerably damaged in the accident which cost Marius Pin his life. Two, however, are certain



CAILLOIS IN NEW DARRACQ GRAND PRIX RACER.

starters—one to be driven by Caillois, who last year had charge of a Thomas in the Vanderbilt race, and the other possibly by Demogeot. There is a rumor that a well-known sportsman, who has bought the third Darracq racer, is endeavoring to obtain the services of Théry, twice victorious in Gordon Bennett races, to return to the racing game as a Darracq driver. Confirmation of this has not yet been obtained.

AILSACRAIG WINS THE BERMUDA RACE

AT the boom of the starting gun at 4:10 P.M., on Saturday, June 8, two trim motor craft passed over an imaginary starting line in the Narrows and headed for distant Bermuda, nearly 800 miles away. Slight mishaps had delayed the start and caused a change of programme. On Friday it was found that the *Ailsa-Craig*, built for Eben Stevens, could not be fitted out

to the rudder head. The bow of the *Idaho* has a moderate rake forward, and the bow sections have a decided flare above the water line. To comply with the regulations a mast has been stepped through the forward part of the cabin top and carries a loose-footed gaff sail; a staysail has also been rigged.

The *Ailsa-Craig*, owned by James Craig, Jr., and Eben Stevens, has been specially constructed to meet the requirements of the Bermuda race. Her designers, A. Cary Smith & Ferris, of New York City, have made her as long as possible to come within the limits of 60 feet, giving her a plumb bow and plumb transom stern, with the rudder hung outboard. The aim has been to produce a boat which could be driven at a high speed in a seaway. She has an unusually high freeboard.

Both Boats Reach Bermuda Safely.

On time allowance *Ailsa-Craig* was victorious in the Bermuda race by 1:16:22. Her actual running time was 64:49:0, compared with 75:2:0 for her rival, *Idaho*. The Craig boat, however, had to accord 8:56:38 time allowance. On the trip from the Lower Bay, New York, fair weather was experienced until Monday night, after which strong westerly winds and rough seas were the order of going. The *Ailsa-Craig* stood up well against the heavy seas, and only stopped once, when the weather had moderated, to shift an igniter. The voyage brought to light but one defect, the insufficient

ventilation of the engine room, which made the work of the engineers particularly arduous. Thomas Fleming Day, who was in charge of the *Ailsa-Craig*, is loud in the praise of his craft, and declares the voyage a success in every way. Five hundred and fifty gallons of gasoline were consumed on the trip. The skipper of the *Idaho* also reports a highly successful trip. From the first the boat fell behind her more powerful rival, and was five miles astern when they lost sight of one another at nightfall. Rough weather was experienced, but the boat proved herself remarkably seaworthy, and no trouble was met with.



AILSACRAIG (CAPTAIN MUELLER), THAT WON THE NEW YORK-BERMUDA RACE.

in time for the noon start from the Scotland Lightship, and it was then determined to send the boats away from the Narrows at a later hour. Meanwhile, at the Motor Boat Club float, on the Hudson, the *Idaho*, her competitor, was being delayed by the absence of one of her crew. A willing substitute was soon found, and when all was ready the little craft swung her anchor aboard and followed the pilot boat *Raymond* down stream in search of her seagoing companion and competitor.

There have been longer motor boat trips than the present one from New York to Bermuda, notably when two American boats, the *Abiel Abbott Low* and *Gregory*, crossed the Atlantic; but in that case the boats were under cruising conditions, whereas the *Idaho* and the *Ailsa-Craig* are under the necessity of going all out. As a test of the seaworthiness and reliability of the motor boat, no competition has ever been held equaling it in strenuousness.

Additional interest is added to the race by the fact that the two boats are of very dissimilar types. The *Idaho*, designed and built by Stearns & McKay, of Marblehead, Mass., for Peter Shields, of Cape May, N. J., is 60 feet over all, 53 feet on the water line, 12 feet 3 inches draft. The motor is the regular four-cylinder 25-horsepower Standard, 6-inch bore by 8-inch stroke. Having been built for use in the shallow waters around Cape May, and only slightly modified to fit for the Bermuda race, her hull is not of heavy construction. Temporary gasoline tanks, bringing the fuel supply to 1,200 gallons, have been fitted, so there is no fear of shortage. The boat is steered from the bridge on the cabin top, and a long tiller for emergency use may be fitted direct



THE IDAHO (CAPTAIN ROBERTS), THAT FINISHED IN SECOND PLACE.

NEWS OF THE CUP RACERS.

Herbert Lytle is to be entrusted with the Pope-Toledo racer, and from the Pope Company comes this information: "We have had any number of applicants to drive our two cars, the racer and the Type XV runabout, in the Vanderbilt race. If we



BERT LYTLE ON HIS NEW POPE-TOLEDO CUP RACER.

made known the names of some of the big race drivers who were after these plums, there would be some new names slated to drive, but we have faith in Lytle. He is the most fearless driver we know and handles a car better. Lytle does not appear to have a nerve in him; he has never been known to lose his self-control, and he has, perhaps, taken more hairbreadth chances than any other driver of an automobile. In fact, Lytle hungers after the dangerous."

From Freeport, Ill., comes information from the Shoemaker Automobile Company that it is constructing a four-cylinder 70-horsepower racing car, weighing only 1,650 pounds, with shaft drive and selective type transmission. The company has great faith in its creation and expects to have it on the roads for trying out in the near future. The same concern intends to enter its 40-horsepower car in many of the important regular stock car contests.

Commenting upon racing, E. R. Thomas says: "I not only favor international stock car contests as well as contests on the order of the Vanderbilt Cup race, but consider them absolutely indispensable for the further mechanical and structural betterment of our automobiles. Endurance runs, tours and road work of all kinds are bound to teach us points, but they cannot compare with speed trials as a source of lessons. The Vanderbilt Cup race shows us the materials to use, the way to design our cars, and what they will stand. International touring car races give us an opportunity to show whether we have taken the proper advantage of those lessons. Not only should the manufacturer encourage such affairs, but he should know that the public has a right to demand them. The more discriminating buyers have come to realize that races such as the Vanderbilt and such as an international stock car race would be are for their benefit as well as that of the man who makes the cars. They have come to see that it is by such means almost entirely that the maker gains the experience that enables him to improve his product, and they know, too, that every race of that kind means money to them, since they can get a better car than before the manufacturer had his racing experience."

When interviewed on the subject of the Vanderbilt Cup race, Henry Rawle, general manager of the Dragon Automobile Company, said that the situation did not worry the Dragon

company, as it had supreme confidence in the A. A. A. Racing Board. Said Mr. Rawle:

"The Racing Board is composed of men of the highest caliber who have the interest of the automobile at heart. They realize that the Vanderbilt is the premier automobile sporting event of the world, and it is my opinion that they will run the race if there is any way in which it can be brought about.

"Regarding the proposed changes in the rules, we have nothing to say. We designed, and are building our cars under the specifications of previous Vanderbilt races, and we feel sure that the cars will give a creditable account of themselves in any event.

"I don't say that, if we had known that a different weight limit was liable to be imposed, we would not, perhaps, have designed a little different car, but there are probably some good reasons for a change, and as it is too late for us to redesign our cars, we are not going to let it worry us."

NEW ROUTES FOR A. C. A. SEALED BONNET TEST.

In making public the list of routes for the four-day Sealed Bonnet contest that is to begin on Wednesday next, the contest committee of the Automobile Club of America figured without its host. Ordinarily the roads selected are in fair shape, but the backward season has caused considerable delay in their annual overhauling, so that road repairers are now at work on them and many are in an almost impassable condition. It is not the intention of the sponsors of the run to make it in any sense a test of endurance, but rather to demonstrate the mechanical perfection of the cars, so that a complete change in the route has been found necessary in order to provide a proper course on which to drive the 600 miles required by the four days of the contest.

As now mapped out, the first day's route will consist of a 150-mile run on Long Island, starting from Long Island City; on the second day the same distance will be covered over the State roads up through White Plains, Mount Kisco, Bedford, and Cross River to Danbury, Conn., and return. For the third day's run the shore road to New Haven and return has been selected, while the fourth day's run will be a repetition of the first.

Since making the former announcement additional entries of a 60-horsepower Thomas Flyer, a 45-horsepower Pierce Arrow and a 30-horsepower Acrocar have been received, bringing the total thus far to 17 cars. Owing to the change in the route, the committee has extended the date for receiving entries to June 15. The entry list at the present writing is as follows:

CLASS A, CARS SELLING AT OVER \$3,000.

American Locomotive Company (Berliet), one touring car.
Lozier Motor Company, two touring cars.
Locomobile Company of America, three touring cars.
Wyckoff, Church & Partridge, Stearns touring car.

CLASS B, CARS SELLING FOR \$1,500 AND LESS THAN \$3,000.

George J Scott Motor Company, one "Glide" touring car.
A. M. Day, one "Elmore" touring car.
Locomobile Company of America, three touring cars.
Atlantic Motor Car Company, one "Stoddard-Dayton" touring car.
Atlantic Motor Car Company, one "Stoddard-Dayton" runabout.
Harry S. Houpt, one "Thomas Flyer" touring car.
Harrolds Motor Car Company, one "Pierce Great Arrow" touring car.
A. M. Robbins, one "Aerocar" touring car.

U. S. M. R. A. ARRANGES A TRACK CIRCUIT.

A twenty-four-hour race for stock cars is to be the feature event of the meet to be held at the Brighton Beach, N. Y., track, August 9 and 10. The United States Motor Racing Association, of which Joseph M. Gaites is the president, will be the promoting body. The same association has applied for the following dates for circular track meets in various parts of the country

June 21-22....	Detroit, Mich.	July 12-13....	Chicago, Ill.
June 28-29....	St. Paul, Minn.	July 19-20....	Indianapolis, Ind.
July 3-4.....	St. Louis, Mo.	July 26-27....	Pittsburg, Pa.
July 6.....	Milwaukee, Wis.	Aug. 2-3.....	Providence, R. I.
July 10.....	Cleveland, O.	Aug. 9-10....	Brighton Beach, N. Y.

ORPHAN'S DAY PREPARATIONS BY THE CLUBS

Quaker City Motor Club to Entertain 1,500 Orphans.

PHILADELPHIA, June 10.—Last Thursday night's meeting of the Quaker City Motor Club was a busy one. Besides the routine business, there was outlined for the coming four weeks a programme which will keep the members quite busy. First in order comes the Orphans' Day run, Wednesday of this week. Then comes the club's first meet of the season, June 28-29. Following this, July 3, will be a reliability run to Wildwood, N. J., with races on beach and boulevard on the 4th. July 14 the club will help entertain visiting Elks.

The Orphans' Day affair is a sure success. Already 125 cars are promised, with additions to the list in each incoming mail. Chairman George H. Smith expects at least 200 cars, which will assure an outing for 1,500 of the parentless little ones. Willow Grove will be the objective point of the outing, and the officials there will throw open all the attractions to their little guests free of charge, besides which there will be a red-letter feed provided by the club.

The feature of the two-day meet which will be pulled off at Point Breeze track will be a 24-hour race, the similar event held a fortnight ago under the auspices of the United States Motor Racing Association having proved such a winner from a sporting viewpoint, if not financially, that there have been insistent demands for a repetition. Besides the headliner, there will be five and ten-mile city championships and two other short-distance events.

The "Over-the-Fourth" outing of the Quakers is the outcome of an invitation from the Wildwood (N. J.) Board of Trade to participate in a race meet on the national holiday, and to give the tourists something to think about on the down trip, on the afternoon of the 3d, the Wildwooders have promoted a reliability run, with special prizes for the clubmen and for outside automobilists as well. Of the eight events on the 4th, which will be run off over the new two-mile-long boulevard, two will be for Quaker members only, to insure a fair amount of plunder for the clubmen.

The Elks reception run, on July 14, will be in the hands of a committee consisting of J. R. Potter, C. E. Shreve and A. T. James, who will outline an itinerary which will give the visitors the best idea of Philadelphia's attractions from an automobile viewpoint.

Harrisburg Hill-Climb for Stock Cars Only.

HARRISBURG, June 10.—Details of the forthcoming hill-climb to be held under the auspices of the Harrisburg Automobile Club on July 4, which will be the first event of the kind fostered by this organization, are now forthcoming. There are to be eight events on the program, and all of them are to be confined to stock cars solely, any special preparations in the way of stripping them of bodies or using special gearing being barred. There will be three prizes for each event, consisting of gold, silver and bronze medals, a silver cup being awarded in addition for the best time of the day. Classes 1 and 2 are for Harrisburg touring cars and runabouts regardless of price, the other classes being graded, Class 3 being for cars costing \$1,000 or under, Class 4 up to \$2,500, Class 5 up to \$4,000, Class 6 up to \$6,000. Class 7 is to be for motorcycles within a radius of 30 miles of Harrisburg, and Class 8 is to be a free-for-all.

Secretary Pierce Resigns from Binghamton Club.

BINGHAMTON, N. Y., June 10.—At a meeting of the Binghamton Automobile Club held last week the resignation of Alderman Norman M. Pierce, as secretary of the club, was accepted, and Mr. Pierce was unanimously elected an honorary member. His resignation is due to the fact that he is shortly to become a resident of Buffalo. S. M. Frechie, the treasurer, has been appointed as secretary, thus combining the two offices. Twenty-eight new members were admitted at the last meeting.

Buffalo Will Celebrate Its Orphans' Day June 26.

BUFFALO, June 10.—At its last regular meeting the board of directors of the Automobile Club of Buffalo has decided to make Wednesday, June 26, Orphans' Day, and has already issued a request to its members to donate the use of their cars for that day for the purpose of providing enjoyment for the many children which it expects to accommodate. Last year's showing was a substantial one, and it is anticipated that the precedent set by the old guard of the club in this direction will prove a strong incentive to the remainder of the club members to make an unprecedented success of the affair.

On Friday last the membership committee of the club held its regular meeting, and the report made shows the club to be in a flourishing condition. On the occasion of its last meeting on May 4, 66 applications for membership were received, but at this meeting no less than 95 were acted upon, bringing the roster up to a total of 806 members, the rate of increase being so rapid and so consistent that it is confidently expected to reach the 1,000 mark by August 1, when an initiation fee will be charged. The club's efforts to facilitate touring in Canada have finally been successful, it now only being necessary to pay a fee of \$5 for the customs and bonding and \$4 for the Ontario license and markers, the secretary taking charge of these details when requested to do so. This result represents the work of a three years' campaign. In connection with its work of regulation, eleven prominent members have just been sworn in as special policemen to put down speeding and reckless driving. To further this end their identity is kept secret.

The Automobile Club of Buffalo has just completed arrangements with the Canadian government for American tourists desiring to take their cars into Canada. Those desiring to cross the border with their cars may do so for the remainder of the present year by paying \$5 for the customs, bonding, etc., and the Ontario vehicle permit and markers cost \$4 additional.

Bridgeport Club to Repeat Hill Climb.

BRIDGEPORT, June 10.—As a result of the great success attendant upon the recent hill-climb up Sport hill on Memorial Day, the Automobile Club of Bridgeport voted to repeat the event on next Labor Day at its regular meeting last week. So much interest was shown that it is thought there will be no difficulty in making the event one of importance to the State as a whole, and efforts will be undertaken to interest the Board of Trade and city officials after the manner adopted at Wilkes-Barre in connection with the Giants' Despair hill-climb there. Reports were received from Ralph Sperry, chairman of the hill-climb committee, and A. L. Riker, referee, showing that the event was a financial success, also that no protests were recorded. It was voted to continue the same committee in office. R. D. Crawford, who drove the Stevens-Duryea Big Six up the hill in 1:32 3-5, was awarded the Yale cup for the amateur driver making the best time in a gasoline car, and has offered the cup as a perpetual challenge trophy to be raced for on Sport hill only.

Active preparations for the celebration of Orphans' Day have been under way for a week past, and culminated yesterday in a trip to Savin Rock by 20 odd cars, carrying between 60 and 100 waifs.

Atlantic City to Hold an Auto Carnival.

ATLANTIC CITY, June 10.—Commencing the week of August 5, Atlantic City is to hold an automobile carnival. On August 5 and 6 there will be a two-day race meet on the beach course at Ventnor under the auspices of the Atlantic City Automobile Club, which has already held two very successful meets on this course, some world's records having been established on the fast straight-away sand stretch of a mile. On Wednesday, August 7, there

will be a grand floral parade along the seven-mile stretch of asphalt of Pacific avenue, with a reviewing stand at the City Park. Silver cups and other prizes are to be awarded, and it is anticipated that there will be a large entry list from Philadelphia and New York. The carnival will end with a three-day automobile exhibit on Young's pier, which is said to be the finest of its kind in existence. The event is being promoted by the Atlantic City Carnival Corporation, composed of the town's leading business men, including Walter E. Edge and Harry Cook, both of whom are well known in New York.

Ohio Valley Autoists Gain a Victory.

WHEELING, W. VA., June 10.—Through its secretary, T. A. Westmyer, the Ohio Valley Automobile Club has been able to score a decisive victory over the toll-gate keepers of eastern Ohio. Up to the rendering of the decision in their favor at St. Clairsville last week, tourists from outside of Ohio have been compelled to pay a toll of five cents a mile, while residents were only taxed half that sum. There has been much dissension between autoists and toll-gate keepers in the past over this matter, sometimes almost coming to blows, but naturally the keeper always got the best of it. The club decided to make a test case and have the thing decided once for all, and to do so had members run through some of the gates, with the result that 2 1-2 cents has been declared to be the legal rate for all alike.

Minneapolis and St. Paul to Hold Joint Race Meet.

MINNEAPOLIS, MINN., July 8.—Arrangements are being completed by the Minneapolis and St. Paul Automobile clubs for the holding of a meet June 28 and 29 on the State Fair Grounds track at Hamline, midway between St. Paul and Minneapolis. H. W. Pickens, manager of the United States Racing Association, signed up contracts whereby that association will furnish drivers for the speed contests. One of the feature events will be a 24-hour endurance contest. The Twin City cup, now held by St. Paul, will be competed for.

The Minneapolis Automobile Club has offered a reward of \$100 for the conviction of any person stealing a machine owned by any member of the club. It has also expressed its willingness to cooperate with the police department in suppressing the scorchers.

Cordial Relations with Public Characterize Geneva Club.

GENEVA, N. Y., June 10.—The Geneva Automobile Club, with a present membership of sixty, is in an exceedingly healthy condition. One of the lines of conduct of the club has always been the enforcement of quiet and reasonable running throughout this section of the country. As a consequence, relations with the public and local authorities are of the best. With a population of 15,000 inhabitants, there has never been an arrest in the city and not a single automobile accident, although Geneva is on the great highway between Buffalo and Albany.

It is hoped that visiting automobilists this summer will drive quietly and reasonably through the city, and thus help continue the good impression that has been created.

Detroit Club's Second Century Run.

DETROIT, June 10.—Last year's "century" held by the Automobile Club of Detroit proved to be such an enjoyable affair for all concerned that it has been decided to repeat it on Saturday next. S. D. Waldon, chairman of the runs and tours committee, is confident of eclipsing last year's event manyfold, as close to 100 entries have already materialized. The day is to be a gala event in more respects than one, as it will be marked by the opening of the new clubhouse, which will be celebrated by a reception and lunch during the afternoon. The combination promises well, and, as Chairman Waldon puts it, both the committees are going to make June 15 a day "to be marked with a white stone."

THE AUTOMOBILE CALENDAR. AMERICAN.

Shows and Meetings.

- Oct. 31-Nov. 7.—New York City, Madison Square Garden, Eighth Annual Automobile Show, Association of Licensed Automobile Manufacturers.
Nov. 30-Dec. 7.—Chicago, Coliseum and First Regt. Armory, Eighth Annual National Automobile Show, and First Annual Commercial Vehicle Show, National Association of Automobile Manufacturers.

Races, Hill-Climbs, etc.

- June 19-22.....—New York City, Sealed Bonnet Contest, under the auspices of the Automobile Club of America.
June 20.....—Albany, N. Y., Annual Tour of the Albany Automobile Club; Route, via New York and Asbury Park, to Atlantic City.
June 26.....—Buffalo, N. Y., Orphans' Day Celebration, Automobile Club of Buffalo.
June 27-28.....—Chicago, Elgin-Aurora Reliability Run, Chicago Motor Club and Chicago Automobile Trade Association.
June 29.....—Reading, Pa., Fair Grounds Track, Race Meet, Reading Automobile Racing Association.
July 4.....—Harrisburg, Pa., Peter's Mountain Hill Climb, Motor Club of Harrisburg.
July 4.....—Houston, Texas, Race Meet, Houston Automobile Club.
July 10.....—Cleveland, O., Start of Fourth Annual Tour of the American Automobile Association, for the Glidden Trophy. Finishes in New York City on or about July 23.
July 13.....—Chicago, Race Meet for the Entertainment of the Glidden Tourists, Chicago Automobile Club.
July 25-28.....—Providence, R. I., Annual Meet of the Federation of American Motorcyclists.
Aug. 1.....—Algonquin, Ill., Hill Climb, Chicago Motor Club and Chicago Automobile Trade Association.
Aug. 9-10.....—New York City, Brighton Beach Track, 24-hour Automobile Race, United States Motor Racing Association.
Sept. 2.....—Bridgeport, Conn., Labor Day Hill Climb, Sport Hill, Bridgeport Automobile Club.
Sept. 5.....—Chicago, Cedar Lake Economy Run, Chicago Motor Club and Chicago Automobile Trade Ass'n.
Sept. 14.....—Albany, N. Y., 95-mile Road Race, under the auspices of the Albany Automobile Club.
Oct. 19.....—St. Louis, Mo., International Aerial Race of the Gordon Bennett Prize. Aero Cub of America.

Motor Boat Races.

- June 15-28.....—Kiel (Germany) Motor Boat Races.
July 20.....—New York to Marblehead, Mass., 270-mile Motor Boat Race. New Rochelle Yacht Club.
Aug. 13-15.....—Chippewa Bay, St. Lawrence River, Gold Challenge Cup Race; American Power Boat Ass'n.
Aug. 22.....—New York to Jamestown (Va.), Annual Cruise American Power Boat Association.
Sept. 2-6.....—Jamestown (Va.) Exposition, Motor Boat Races.

FOREIGN.

Shows.

- Nov. 12-Dec. 1.—Paris, Exposition Decennale de l'Automobile, Grand Palais, Esplanade des Invalides, Automobile Club of France.

Races, Hill-Climbs, etc.

- June 14.....—German Emperor's Cup, Taunus Circuit, Imperial Automobile Club.
June 20-22.....—American Gold Cup, Start from New York for European Tour for American Cars, Georges Dupuy, secretary, 1402 Broadway, New York City.
June 14-29.....—Scottish Reliability Trial, Scottish Auto Club.
July 2.....—Grand Prix, Automobile Club of France.
July 14, 1908....—Paris to London, Aerial Race.
July 15-18.....—Ostend Week, Record Trials, Automobile Club of Belgium.
July 21.....—Ardennes Circuit (Belgium).
July 31.....—Liedekerke Cup for Touring Cars, Ardennes Circuit, Belgium.
July 31-Aug. 8.—Belgium Regularity Contest for Touring Cars, A. C. of Belgium.
Aug. 1-7.....—Criterium of France, 1,750 Miles Touring Competition and 250-mile Race for the Press Cup, A. C. of France.
Aug. 11-29.....—France, Coupe de Auvergne.
Sept. 1-2.....—Italy, Brescia Circuit, Florio Cup. A. C. of Italy.

MICHIGAN STATE AUTOMOBILE ASSOCIATION.

DETROIT, MICH., June 10.—The Michigan State Automobile Association of the A. A. A. has been organized not only with the object of promoting the pleasure of its members, but to increase the number of good roads in the State. Edwin S. George, who is active in all things pertaining to automobiling, is president, and is also the chief officer of the Detroit Automobile Club, and largely responsible for making the Detroit organization as large and influential as it is. Mr. George's activity has been instrumental in bringing about the erection of a fine clubhouse.



EDWIN S. GEORGE.
President.

The vice-president of the organization, Dexter M. Ferry, Jr., is also of Detroit. He is chairman of the legislative committee of the Detroit club, and as such has made it his business to watch out for the interests of automobilists of the State when new measures have come before the legislature.

Dr. D. Emmett Welsh, of Grand Rapids, is secretary of both the State body and the Grand Rapids club. He is also a member of the board of directors of the national organization and is one of the best known professional men in Grand Rapids.

James R. Jackson, of Grand Rapids, the treasurer of the



DEXTER M. FERRY, JR.
Vice-President.

DR. D. E. WELSH.
Secretary.

JAMES R. JACKSON.
Treasurer.

association and chairman of the membership committee, is one of the most enthusiastic autoists anywhere. He is a member of the touring board of the A. A. A. He deserves a large part of the credit for the clubhouse recently erected at Cascade by the Grand Rapids club.

WANTED—A GOOD LONG HILL TO CLIMB.

CLEVELAND, O., June 10.—Saturday's event, which was to have been held at Gates Mill hill, and which has aroused unending interest among local autoists, had to be postponed owing to the opposition of residents in the vicinity to the use of the hill for that purpose. Since then numerous localities have been heard from, but the contest committee of the Cleveland Automobile Club has come to no decisions as yet regarding the place or time of holding the postponed meet. The situation is somewhat complicated by the unusually bad condition of the roads intervening between Cleveland and some of the more promising places for the climb, as well as the fact that the hills themselves are not in the best of condition. No less than sixty-five entries have been received to date for the eight events on the program, and it is confidently anticipated that this number will be largely augmented as soon as something definite regarding the holding of the climb is made public.

TO RUN NEW JERSEY TIE OFF LATER.

Out of the many suggestions made as to the proper awarding of the Shanley and Sinclair prizes for touring cars and runabouts, for which seven cars were tied in the first class and five in the second in the New Jersey Automobile and Motor Club's recent run, has come one that is satisfactory to all concerned, and that is, "Fight it out on the same line"—and "may the best car win," might be added as an afterthought, for each is determined that the honors will be all his when it comes to settling the draw. In the meantime, the names of the cars and the contestants are to be engraved on the cups, though this was opposed at first. J. B. Ryall, whose Matheson finished with a clean score, and F. E. Boland, whose National was in the same class, were both in favor of immediately holding another deciding test, and some of the others held a similar opinion.

The meeting of the winners was held at the same time as the gathering of the Endurance Run Committee, at the clubhouse in Newark, and with the official announcement of the scores by the latter was that of the determination of the former to enter any future contest held, when the car finishing first will be awarded the respective trophy. Before this was settled upon, several other suggestions were made, one of which, that of drawing for the prize, met momentary favor among the runabout winners, but J. W. Mason, who was the lucky man, refused to accept it and stated his desire to have the prize competed for in some future event. J. B. Ryall announced his intention of consulting with the donor of the prize in regard to holding a deciding test later.

SEVEN TIE IN LONG ISLAND TEST.

Apparently the Long Island Automobile Club has undertaken an impossible task. In its two-day endurance test, on Decoration Day, ten machines tied with clean scores in three classes. To get the trophies off his hands, Chairman Charles Jerome Edwards, of the Touring Committee, selected a 186-mile route, from the clubhouse to Riverhead and back, and invited the invincibles to .y conclusions. Although the roads were the roughest and steepest to be found on the island, being along the hilly north shore both outward and returning, it made no difference to the machines, every one arriving at controls on time, consequently having clean scores. Classes A, B and C had to furnish an average of 15, 18 and 20 miles an hour respectively.

When the observers' cards were examined it was found that the Oldsmobile could be eliminated from Class B for having lifted off the commutator cap to remove a little gummed oil, and that in Class C the Pope-Toledo could be marked down for changing a spark plug and the Matheson for losing its dust pan. This left a tie in Class A between a Cadillac and a Maxwell; in Class B between Pope-Hartford and Columbia, and in Class C a three-cornered tie between Packard, Pierce and Winton. Club officials declare it is a hopeless task and will not try again. The competitors in the run were:

CLASS A.

Cadillac, 10-horsepower, Jasper D. Rouke, tied.
Maxwell, 18-horsepower, I. C. Kerkhan, tied.

CLASS B.

Pope-Hartford, 25-horsepower, C. G. Arnold, tied.
Columbia, 24-horsepower, E. H. Barnum, tied.
Oldsmobile, 35-horsepower, R. E. Pardee, penalized.

CLASS C.

Winton, 40-horsepower, C. A. Carlson, tied.
Pierce, 40-horsepower, E. R. Strong, tied.
Packard, 30-horsepower, S. H. Burns, tied.
Matheson, 40-horsepower, R. G. Kelsey, penalized.
Pope-Toledo, 50-horsepower, A. N. Wilcox, penalized.

BAY STATERS WILL RUN TO GLOUCESTER.

BOSTON, June 8.—The annual June outing of the Bay State Automobile Association will be held this year on Saturday, Sunday and Monday, June 15, 16 and 17, at the Colonial Arms, an impossible task. In its two-day endurance test, on Decoration program for the three days.



LAST 1907 LOCOMOBILE AND THE FACTORY STAFF.

On June 8 the Locomobile Company put the finishing touches to the last completed car of this year's output. Designer A. L. Riker is at the wheel, superintendent E. F. Russell beside him. In the tonneau from right to left are Publicity Manager J. A. Kingman, William Shortleeve, A. C. Schultz and Harry Stillman.

OLD ADMINISTRATION RETAINS THE REINS.

BOSTON, June 10.—Because of an effort which was made by some of the members of the Boston Automobile Dealers' Association to oust the present administration, which has been in control almost since the organization of the association, and substitute a new board of directors, the annual meeting last week was the largest and most exciting ever held by the dealers in this city. Every member had been canvassed prior to the meeting and there was a large attendance. The opposition, however, was only successful in electing one new member to the board of directors, the other members being re-elected. The new member is Charles E. Fay, manager of the Ford branch. The members re-elected are J. H. MacAlman, manager of the Electric Vehicle Company branch; F. A. Hinchcliffe, manager of the Winton branch; A. P. Underhill, of the Reed-Underhill Company; J. W. Maguire, of J. W. Maguire & Co.; S. K. Dingle, of the Concord Motor Car Company; George H. Lowe, of the George H. Lowe Company; J. S. Hathaway, of the White branch, and Harry Fosdick, of the Harry Fosdick Company. The officers were re-elected as follows: President, J. H. MacAlman; vice-president, George H. Lowe; treasurer, Harry Fosdick, and secretary, Chester I. Campbell. Secretary Campbell was elected manager of the show to be held in March, 1908.

SPLITDORF MOVES WAY UPTOWN IN N. Y. C.

The Splitdorf Laboratory, for many years located at 17-27 Vandewater street, which is in the heart of downtown New York, has moved almost to the other end of the city—261-265 Walton Avenue, corner 138th Street, in the Borough of the Bronx. Their new plant is a six-story-and-basement structure of the latest fire-proof construction. It has a total floor space of over 50,000 square feet, every foot of which will be utilized by the Splitdorf Laboratory for the production of the specialties with which the name for so many years has been identified. One important feature is the installation of the Edison breakdown system, which can be thrown in at a moment's notice, thus insuring uninterrupted work.

SELDEN AUTOMOBILE CO.'S FIRST CAR READY.

ROCHESTER, N. Y., June 10.—The first car to be constructed by the new Selden Automobile Company will be given a tryout this week. It will be equipped with a motor of sixty horsepower, and will be constructed throughout of the finest material obtainable.

TWO-WHEELERS TO HAVE ELIMINATING RUN.

In order that there shall be no annoying cases of drawn battles to settle at the end of its endurance run, H. J. Wehman, chairman of the committee in charge of the national endurance run of the Federation of American Motorcyclists, has prepared a set of rules that will make the honor worth striving for and the victory well-earned. The event will form a curtain raiser for the annual meet of the organization at Providence, R. I. It will be started from New York City at 4:30 A. M., Tuesday, July 30, and the first day's run will be to Springfield, Mass., 190 miles, via Poughkeepsie, N. Y., Lakeville, Conn., and Lenox, Mass. The remainder of the run, 87 miles, is to be covered in half a day and the route will be via Worcester. Controls for the day and half run will be at Poughkeepsie, Springfield, Worcester and Providence, the schedule being based on a running time of 15 miles an hour, the penalties to be one point for each minute late and two points for each minute early, with a five minute allowance for variation of watches. The competitors will be divided into two classes, A and B, the former consisting of all single-cylinder machines and the latter, two or more cylinders, each starter being given an initial credit of 1,000 points. In order that only one rider shall finish with a clean score, the hill-climbing capacity of the machines is to be tested on Jacob's Ladder in the Berkshires, and its fuel consumption at the track in Providence, by starting the competitors off with a pint of gasoline each. The first ten to finish in the first class and the first five in the second class will be deemed Honor Men and receive gold medals, while each leader will be awarded a diamond medal. The entry fee is \$5, and the entries close July 20, with the chairman, H. J. Wehman, 108 Park Row, New York City.

ANOTHER NON-STOP CADILLAC RECORD.

Over 1,000 miles without the motor stopping one single revolution, and that after the car had already been driven 31,000 miles during the past four years of constant service, is the recent accomplishment of a 1903 Model A single-cylinder Cadillac, formerly owned by Roy McCardell, the well-known humorist.

The start was made from the City Hall in Chicago, on Monday morning, May 27, and his Honor, Fred Busse, the newly elected Mayor of that city, wielded the crank which set the engine going.

The run was a most strenuous and nerve-racking one, for the most part over the streets of Chicago and suburbs. The total run covered 1,221 miles. It might have run several times that distance without stopping, and it was thought for a while to continue the run until the engine should stop, but owing to the fatigue of the drivers, who had been on duty for many hours with but little sleep when each relieved the other, the idea was abandoned when the car had completed the trial as originally planned, and it was retired with well-earned honors.

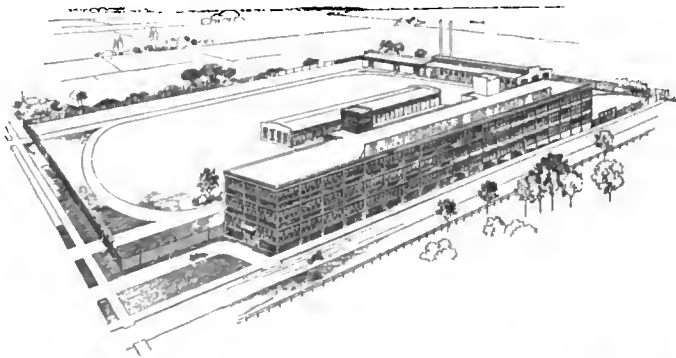


TO LAY CORNERSTONE OF MAXWELL PLANT.

Saturday, June 22, is to be a gala day for Newcastle, Ind., for it will mark an important step in the town's history. On that day, with much formality, speech-making and general handshaking, the community's advent as a factor in the American automobile industry is to be celebrated. To say that the inhabitants have laid themselves out some in preparation for the auspicious event is to put it mildly indeed. The ceremonies are to be given at 2 P. M., when several lodges and societies will assemble in the Court House Square and march to the site of the factory. The "speechifying" will include addresses by Vice-President Fairbanks, the guest of honor, and by Judges Bundy and Forkner and the Hon. C. S. Hernley. The town will be suitably decorated, and nothing is to be left undone to make the Maxwell coming a thing long to be remembered in local history.

THOMAS DETROIT PLANT NEARLY FINISHED.

DETROIT, June 10.—Some idea of what the new plant of the E. R. Thomas Motor Company at Detroit will look like when completed may be obtained from the accompanying illustration. At the present writing the construction of the plant has already reached an advanced stage, and the company not only expects to complete the building within a very short time, but also to have the entire equipment installed and the machinery turning by



THOMAS DETROIT FACTORY AS IT WILL APPEAR COMPLETED.

September next. The construction is all of reinforced concrete, and the main building is already up to the second floor. The plant will eventually cover the large plot of ground which has a frontage of two city blocks on Detroit's famous Jefferson avenue. This year's output of Thomas Forties has already been completed, so far as the construction departments are concerned, and by the time this appears the testers will have finished with the last of them, as it is expected to ship them on June 15. The total number of touring cars and runabouts turned out reached 503—a figure that will not only be greatly surpassed next season, but earlier deliveries will also be made, due to the largely increased facilities at hand.

SOME TRADE NEWS FROM QUAKERTOWN.

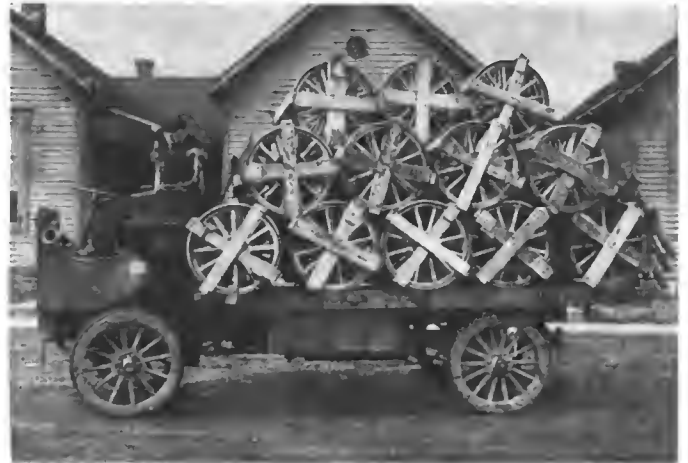
PHILADELPHIA, June 10.—The Harry S. Houpt Company, of New York, opened its handsome new local branch house at 139-141 South Broad Street on last Saturday afternoon. The complete line of Thomas cars was inspected by hundreds of visitors during the day, while Manager Andrew S. Robinson, a former Quaker, who has been connected with the New York house for a number of years, did the honors.

The Carter Motor Car Corporation, of Detroit, has opened an office in the Commonwealth Trust Building, at Twelfth and Chestnut Streets, and is offering treasury stock at \$1 per share to raise funds for the erection of a factory at Berwyn, Md., a suburb of the National Capital.

The Dragon Automobile Company has secured the services of J. C. Middleton as assistant sales manager. He was formerly connected with the Autocar sales department at Ardmore.

PREMIER BRINGS OUT COMBINATION CAR.

Concurrently with their pleasure car business, the Premier Motor Manufacturing Company, Indianapolis, Ind., has been devoting considerable attention to the commercial vehicle end, and their study has been along somewhat out of the ordinary lines. The first concrete results of this extended investigation are illustrated by the accompanying photographs, and, though they are



PREMIER TRUCK IN ITS EVERYDAY BUSINESS ROLE.

not turning these vehicles out for the market as yet, owing to the very heavy demand for regulation pleasure cars, the possibilities of a car such as that shown are evident at a glance. The vehicle shown has proved very successful in service, and has been used steadily for transferring freight to and from the railroad depots, while when equipped with removable seats it accommodates a good number of passengers, as shown by the view of the Premier baseball team, bound for its regular Saturday afternoon game, the other photograph illustrating it with a Premier runabout for shipment. It is designed for a two-ton load, but has an over-



THE TRUCK TRANSFORMED AND ON PLEASURE BENT.

load capacity of almost double that, frequently carrying as much as 7,400 pounds. It is equipped with the standard 24-horsepower Premier motor, sliding change-speed gear, 30-inch wheels, solid tires, and is carried on three-quarter platform springs in the rear and semi-elliptics in front.

AUTOMOBILE IMPORTS SHOW A FALLING OFF.

Advance import returns for the month of May past show a decline in the value of imported cars entered at the port of New York during that period as compared with the same month a year ago. The total valuation in 1906 reached \$466,230.06 and represented 134 cars, while this year but 120 have been brought in with a value of \$409,926.29.



LATEST ADDITION TO THE BERLIET LINE LOOKS POWERFUL.

New 40-horsepower Berliet runabout, the production of the American Locomotive Automobile Company, that is a symphony in cream, offset by delicate green trimmings. It is one of the very fast three seaters that is credited with being able to do better than a mile a minute.

VERY HEALTHY WESTERN AUTO DEMAND.

Robert E. Graham, vice-president of the Acme Motor Car Company, of Reading, Pa., recently returned from the Rocky Mountain country and expressed the following opinions:

"The Pacific coast at this time, so far as my personal observation goes, is about the best market for low and medium-priced cars, that there is in the country. Because of the condition of the streets in San Francisco, rendering them almost impassable for horse-drawn vehicles and because of the long-continued tie-up of the street car lines, the automobile as a means of getting about is almost a necessity.

"A very large trade, too, has grown up with the various mining camps. Distances that were formerly a matter of days for animals to cover, are readily traversable in a comparatively short time with the automobile—a few hours instead of a few days. The most unsatisfactory feature of the Western market, as far as an Eastern factory is concerned, is the great delay in receiving shipments. The railroads claim, however, that they are gradually overcoming this and look for better results in the future. Neither the Pacific Coast nor that portion of the Middle West which I saw appears to have felt the recent stock market depression in any degree.

A ONE-DAY RUN WORTH MENTIONING.

A run that was a record in several respects was made Sunday, when two women drove a 1903 car alone from Springfield to New York in twelve hours total time, and less than ten hours actual



VISITING OLD PLYMOUTH ROCK IN A "FULL JEWEL" CORBIN.

running time. The distance is 157 miles, or more than the average day's run in the Glidden contest and more than will be the task of the cars in the sealed bonnet contest of the Automobile Club of America next week. The women were Mrs. E. Philips, wife of Dr. Calvin Philips, and Mrs. Arthur Jervis, both of New York City. The car was a single-cylinder Knox, of ten-horsepower, that has been in continuous service since 1903. The car is that of Mrs. Philips, and she was the driver. Mrs. Philips is as proficient in the care of the car, and even in its repairs, as a professional chauffeur, and takes pride in going out alone with it. The start from Springfield was made at 10 A. M. The roads were very bad, especially from Springfield to Hartford, but the women brought the car through without mishap, stopping for meals more than two hours and arriving at the Rutland, Fifty-seventh street and Broadway, at 10 P. M.

THINGS DOING AMONG THE GARAGES.

Rochester, N. Y.—Fire Marshal Walter has been asked permission by A. Vernon Hart to construct a garage in Cambridge street, near Park avenue. The building is to be of brick, two stories high, and will cost \$12,000.

Toledo, O.—J. J. Maher has just purchased the garage and rubber business of the Cooney Company, at 120-122 Twenty-second street, and will continue the business without change under the name of the Maher Garage Company.

Chicago.—Wolf & Ring have just opened a new garage on Leland avenue, west of Evanston avenue, this city, that is up-to-date in every respect. A specialty will be made of towing and touring livery, sundries, repairs and overhauling.

Lowell, Mass.—Under the title of the City Hall Garage, a new auto station has been established on Moody street. It is most completely equipped in every respect, and has ample accommodation for 100 cars. Fred Walsh is the manager.

Marysville, O.—Dr. O. H. Thorpe has just opened a small garage here which he has placed in charge of Byron Ellis. Accommodation is provided for twenty odd cars, and supplies will be handled. In addition cars will be kept for renting and machines will be sold on order, no stock being carried.

Muskogee, I. T.—The Southwestern Automobile & Vehicle Company has been organized here with a capital of \$25,000. W. E. Gordon is president; J. S. Weeks, vice-president; W. C. Frankline, secretary; A. G. Harmon, treasurer, and W. R. Waton, second vice-president. A regular garage business will be done.

Providence, R. I.—The C. D. Snow Company is now running at full blast in its new quarters at Broad street and Potter avenue, which they took possession of some time ago. The facilities that have since been installed make this one of the most ambitious establishments in the New England district. The company confines its attention to the Stevens-Duryea line.

Nappanee, Ind.—Keller & Jeffries are building a new garage to accommodate about twenty-five cars. It measures 30 by 60 feet and is two stories high, and will be equipped with an up-to-date repair shop, as well as other facilities for taking care of machines. Nappanee is on the route of the Glidden Tour, and the proprietors expect to have their establishment in running order by the time the A. A. A. tourists strike the town.

City of Mexico.—Under the title of El Garage Anglo-Mexicano, what is probably the most extensive auto establishment south of the Mexican border, has just been inaugurated in the Calle Providencia, number 7. Owing to its distance from other facilities it is most completely equipped in every respect, having a large machine shop and carrying a very large stock of spares. As its name indicates, it makes a specialty of British cars, handling the Argyle, Leader and Humber, beside carrying a very complete assortment of accessories and clothing. The company is a corporation with a capital of \$100,000, all paid in.

BRIEF ITEMS OF NEWS AND TRADE MISCELLANY

Application for membership in the New York Automobile Trade Association has been made by the Waltham Manufacturing Company, makers of the Waltham-Orient, and the Corbin Motor Vehicle Corporation.

Additional evidence that the motor vehicle for commercial purposes is surely and rapidly displacing the horse-drawn vehicle is furnished by Arnold, Constable & Co., New York City, who have just received four Maxwell delivery cars and put them into commission. It is very probable that this big house will dispense with its horse service entirely.

Returning from a three weeks' visit to the Pacific Coast cities, Charles B. Shanks, general sales manager of the Winton Company, declares that San Francisco looks infinitely better than when he was there just after the fire. Automobile interest in the West is growing with the country, the demand for highest quality cars being decidedly on the increase.

The annual excursion and picnic of the Winton employees, at Cedar Point, June 17, will also be participated in by the employees of the American Ball-Bearing Company, and the Baker Motor Vehicle Company. The three big plants of these companies will close to give the excursion right of way. A ball game between the Winton and the Ball-Bearing teams will be a feature.

Work is progressing favorably on the new steel and concrete building to be used for the factory of the Pennsylvania Auto-Motor Company, at Bryn Mawr, Pa. The plant will be so arranged that the raw stock can be taken into the factory from a railroad siding at one end, pass through the building, and return to the same siding. Arrangements are being made for 500 regular machines next year, deliveries to begin early in September.

In a recent report made by the Chamber of Commerce, Syracuse, N. Y., it was shown that the automobile was the greatest of their one hundred and thirty different industries, the H. H. Franklin Manufacturing Company having increased their business during the past three years to a point where they now employ seventeen hundred men, which is more than the total number employed by the fifty-two clothing manufacturers, the forty-eight foundries and machine shops, and nearly twice as many as employed by the three typewriter factories.

Toledo, Ohio, comes into notice just at this time, when speed laws are so widely discussed, by cutting down the speed limit to ten miles per hour and organizing a motor-cycle police corps, who are keeping close tab on automobile speeders, and particularly the Pope-Toledo testers. A few years ago the Pope people established a course on the outskirts of the city, but were compelled to retire to the "tall timbers" on account of speed laws. The company has now selected a stretch outside the city limits, which includes sand, mud, and all kinds of hills, and think they now have a course which cannot be beaten for testing.

Michelin & Cie, of Clermont-Ferrand, France, have just notified their Ameri-

can agents, E. Lamberjack & Co., of New York City, of another remarkable performance by Michelin tires. Starting from Paris at 2 p. m., May 6, Sorel, in a 60-horsepower De Dietrich stock car, covered the 930 miles of rough roads between Paris and Madrid in the wonderful time of 28 hours 14 minutes. This record is attested by officials, and not only lowers the best previous time for automobiles, but is faster than the fastest express train running between these two cities. The run was made in a rain-storm, at an average rate of thirty-four miles per hour. Michelin tires were used during the entire trip.

RECENT BUSINESS CHANGES.

The Rambler agency in Chicago, which for a long time has been located in Wabash Avenue, near Congress street, has removed to 1462-1464 Michigan Avenue, in the heart of the local auto selling district.

F. E. Goodwin has purchased the property of the Motor Components Manufacturing Company, of Des Moines, Iowa, from the receiver for \$2,555.61. The company recently went into the hands of a receiver upon petition of Grover Hubbell and B. S. Walker. W. H. Kitto, formerly secretary, now has suits pending for \$100,000 damages against these parties.

NEW AGENCIES ESTABLISHED.

The Corbin Motor Vehicle Corporation, of New York, has issued engraved cards of invitation for an inspection of its new offices and salesrooms, at 1892 Broadway.

The Dragon Automobile Company, of Philadelphia, is about to open a city showroom and office in that city to handle retail trade. The new headquarters will be located in the latest addition to automobile row, opposite the Union League.

William G. Isbell, formerly associated with Guy R. Pierce in the Chicago agency for Baker electrics, has organized a company under the title of William G. Isbell & Company, and will represent the American Simplex, made by the Simplex Motor Car Company, of Mishawaka, Ind. The new concern will retain the old headquarters at 1413 Michigan Avenue, Chicago.

Indianapolis has a new concern in the selling trade, the Indianapolis Motor Car Company, with temporary headquarters at 114-119 Kentucky Avenue, and the following officers: A. W. Markham, president; R. A. Radle, vice-president and general manager, and Paul Smith, secretary and treasurer. The company will handle the Dragon and the Logan line of commercial cars.

The Renault Freres selling branch, of New York City, announces through Manager Paul Lacroix a new sub-agent for Renault cars—Louis P. McNamara, whose salesrooms are located at Broadway and Forty-eighth street. This is the fifth New York agency established in less than two years, the others being the Palais de l'Automobile, Brewster & Company, Demarest & Company, and Cryder & Company.

The Baker Electric Vehicle agency, with Guy R. Pierce as general manager, has closed a long lease on the new auto garage and salesroom at 1714 Michigan Avenue, Chicago, and from this location Baker elec-

trics will be disposed of in the future in that city. A complete new electric plant has been installed, and when the decorators have fully completed their work on the salesroom it will be one of the most elaborate stores on the avenue.

PERSONAL TRADE MENTION.

Clinton R. Mabley has entered upon his duties as general manager for the Importers' Automobile Salon, with offices in the new Bryant Park Building, Sixth Avenue and Forty-second Street, New York.

Orville Sprecher, formerly vice-president and superintendent of the Prest-O-Lite Company, resigned on June 1 to join forces with the Avery Portable Lighting Company, and will reside in Milwaukee in the future.

R. D. Aldrich has resigned his position as manager of the New York branch of the Rose Manufacturing Company to become sales manager of the Twentieth Century Manufacturing Company, 19 Warren street, New York.

Thomas F. Ahern, formerly of Cleveland, has been appointed general superintendent of manufacture for the Wayne Automobile Company, of Detroit. Mr. Ahern has taken up his residence in Detroit and entered upon the duties of his new position.

At a special meeting of the directors of the Joseph Dixon Crucible Company, of Jersey City, N. J., held May 31, to take action on the death of John A. Walker, vice-president and treasurer, George T. Smith was elected vice-president; George E. Long, treasurer, and Harry Dailey, secretary.

J. H. O'Brien, for the past year factory manager for the Wayne Automobile Company, Detroit, Mich., and prior to that time in a similar position with the Ford Automobile Company, of the same city, has just severed his connection with the Wayne Company, and though Mr. O'Brien gives no hint of his future plans, his long experience in the automobile building field makes it certain that he will be heard from in the near future.

A NEW THIRTY-TON TRUCK.

Detroit again comes forth as the sponsor of a novel commercial vehicle. It is a heavy truck of the heaviest kind, for, although its power plant only consists of a 40-horsepower gasoline motor, its weight all on is something like seven tons, and it is said to have a carrying capacity of approximately thirty tons, in addition to having some power still in reserve to draw a trailer or two. It is the invention of John E. Myers, of Sheperd, Mich., who has been at work on it for the past half year. The rear wheels are 52 inches in diameter by 20 inches face, and the front wheels are 44 inches in diameter by 14 inches face. The truck is to be shipped to Alabama.

HOPEWELL TIRE CASE PATENT.

F. B. Hopewell, of Hopewell Brothers, Cambridge, Mass., has just been granted what is claimed to be a basic patent covering the design of a spare tire case, such as is universally used for carrying extra shoes on the car. The patent is No. 854,215, and was issued May 21,

1907, and it is the patentee's opinion that his claims broadly cover an annular tire case, as the only limitation in the patent is that it must be an annular case, though not specially limited to being a continuous case.

Claim 1 reads as follows: "An annular tire case composed of material having at each edge a longitudinal pocket, and a cord in each pocket to retain the pocketed edges of the case in a circle smaller than the circle defining the circumference of the tire." The case thus being caused to fit the tire by tightening a cord which contracts the edges of the case to a diameter smaller than that of the tire. The case itself was illustrated and described in THE AUTOMOBILE of May 23.

TRADE PUBLICATIONS RECEIVED.

From the Gearless Transmission Company, Rochester, N. Y., is to hand the firm's catalogue of 1907 models. It is well produced in colors, with illustrations on every page, and deals with all the models manufactured.

Three interesting touring stories, descriptions of new models and news culled from various quarters, is the bill of fare of No. 26 of the Rambler Magazine, issued by the Thomas B. Jeffrey Company, of Kenosha, Wis. Though especially appealing to the Rambler owner, the magazine should be interesting to all automobilists.

A new booklet is out from the Firestone Tire and Rubber Company's headquarters, at Akron, Ohio, dealing in general with the various types of pneumatic tires manufactured by this company, and giving special attention to the Safety Universal rim. Illustrations explain the constructional features of the Firestone detachable, and a number of halftones show the operation of mounting and dismounting.

There is a particularly handsome appearance about the Thomas Flyer catalogue, issued by the E. R. Thomas Motor Company, Buffalo, N. Y. Excellent half-tone views of the Buffalo and Detroit works and of the different agencies throughout the country, complete and detailed views of the car and explicit text, unite to make it one of the best of trade catalogues. The half-tone illustrations of mechanical parts and the sectionalized views of the motors are particularly helpful to those wishing to obtain a good knowledge of the construction of the Thomas Flyer and the Thomas Forty.

AN AFTERTHOUGHT OF JONES'.

"A Past Performance" is the title of an artistically executed little brochure from the Publicity Press concerning an event that has long since gone down the line into history, reckoning at the speed at which automobile history is made. To the ninety and nine who responded to the glad call, it will bring back a pleasant reminder of an evening well spent, and to the one who didn't, a wish that he had cut it out, whatever it happened to be, and attached himself to the gay bunch that went on the special with "eighteen speeds forward and no reverse"—to the place that is "forty-five minutes from Broadway"—the Jones Speedometer Factory at New Rochelle. It was hardly necessary to add that last, for every man who got

there recalls the day, date, time and place, while those who got bids and didn't materialize have been hearing of it ever since. The little book is a fitting commemoration of the event.

INFORMATION FOR AUTO USERS.

Gauntlet Monograms.—In addition to the already widely varied line of monograms turned out by the J. W. Colgan Company, Boston, Mass., this firm is making a specialty of some neat designs to be applied to automobiling gauntlets, samples of which are illustrated by the



COLGAN'S MONOGRAM GAUNTLETS.

accompanying cut. This, of course, only shows two designs, there being quite a variety. In connection with the addition of this new line, these makers have just issued a 32-page catalogue showing some of the many purposes for which they make monograms in all styles, such as for automobile radiators, medallions for robes, fittings and the like, as well as a variety of special insignia, trade marks and similar pieces.

"Caterpillar Flame Coils."—This is the rather unusual name given by the Pfanstiehl Electric Laboratory of Worth, Chicago, Ill., to their line of dashboard jump-spark coils. The peculiar wormlike appearance of the discharge of the coils in question, which is claimed by the makers to give a maximum of efficiency in operation on a minimum current consumption, is responsible for their title. In addition, these coils possess numerous other advantages, such as an extremely rapid and silent-working vibrator, which, taken in connection with an electrical design that eliminates the objectionable sparking at the vibrator points, combine to make as close an approach to the autoist's ideal of a troubleless coil as it is possible to turn out. These results are obtained by methods covered by American and foreign patents and an accurate balancing of the primary and secondary windings. The latter is wound in 14 sections, and is of unusually large wire. The sections are connected in pairs, and are thoroughly insulated so as to be proof against

excessive overloads. The primary is wound with much finer wire than is ordinarily employed on induction coils of this type. The coils are all made on the unit system, and each unit is patterned after the large x-ray coils on which these makers have been experimenting for the past five years. It is possible to take x-ray photographs with any of the regular automobile type of units, using current at a potential of 10 volts, which is somewhat remarkable, and is evidence of the great intensity of the discharge. These coils are made for 1, 2, 4 and 6-cylinder motors, the illustration showing the twin type.

Michelin's Handy Tire Gauge.—*Plus un pneu est gonflé, moins il chauffe.* To the experienced tire user, this is an axiom. The better a tire is inflated, the less it heats. Simply because there is less opportunity for friction between its different parts and principally between the shoe and the inner tube. But how many drivers, even after considerable experience, can tell offhand when a tire is properly inflated? It was easy enough to test the old bicycle tire merely by attempting to compress it with the hand, but an automobile tire may be little more than three quarters inflated and still give no indication of it, especially when viewed with the car empty. On the whole there is probably nothing so important in the tire user's breviary as the matter of proper inflation, and to make this an easily ascertainable matter, Michelin et Cie have devised a neat and compact pressure gauge of which circulars have been sent to their U. S. agents, E. Lamberjack & Company, 31-33 West Thirty-first street. As shown by the illustration this is readily attachable to the valve by means of the quick adjustment type of screw. Once in place, the button on top is pressed to obtain a reading, the dial being calibrated in kilos. And, say the makers, exhaustive tests have shown that a tire carrying 5 kilos pressure, which represented its proper degree of inflation, lasted three to five times as long as the same size tire inflated to 2.1-2 kilos and run on the same car under the same conditions throughout the length of the test.



TWO-CYLINDER PFANSTIEHL DASH COIL.

THE AUTOMOBILE



FLORAL ARCHES WERE ERECTED IN EVERY VILLAGE ON THE COURSE.

HOMBURG, GERMANY, June 14.—Felice Nazzaro, on a Fiat machine has captured the German Emperor's Cup, which all day long has been invitingly displayed to contestants and observers on the royal grandstands at Kloster Thron. His time for the four rounds of the 125-kilometer sinuous mountain circuit was 5:34:26, which is at the rate of 55.5 miles an hour. Considering the extraordinarily difficult nature of the course, the time is remarkably fast. Two years ago on the Auvergne circuit, which in the matter of turns and grades presents much similarity with the German course, Thiéry averaging 48.7 miles an hour for about the same distance; as the machines in the German race are lower in power than those engaged in the Gordon Bennett contest, the conclusion to be drawn from the comparison is a decided increase in the efficiency of the racing automobile of 1907 over that of 1905. On the Taunus circuit of 1904, much easier than this year's course, Thiéry's average, then considered very fast, did not exceed 59 miles an hour.

Second position in the German Emperor's race was secured by Hautvest, a Belgian who has won fame in touring competitions in his own land, but who has not previously figured in international speed tests. His Pipe machine, also a Belgian, was but four minutes 44 seconds slower than Nazzaro's Fiat. Michel, on an Opel machine of German origin, secured third position, but thirty-nine seconds behind the Belgian. Fifth and sixth positions have been secured respectively by Wagner and Lancia on Fiat racers, thus making the premier Italian factory the most successful in the contest. Henry Fournier, the ex-champion of France, who has returned to the racing game after an absence of several years, secured eighth place in an Itala, an Italian car of which he is the exclusive Paris selling agent.

Owing to the large number of entries, the race for the German Emperor's Cup was run in two stages, a preliminary on Wednesday to select forty to compete in the final, and the decisive con-

test on Thursday. Thus there were never more than forty machines on the course at once. Two rounds of the circuit only were run on the first day, and four in the final. France, Italy, Belgium, England, Austria and Switzerland were the nations engaged; America had no representatives. Heavy rain had made the course dangerous on the first day, and one fatal accident had to be recorded. For the final, however, the roads had become thoroughly dry, and all passed off satisfactorily.

The royal party, which assembled before 6 o'clock at the grandstands erected at Kloster Thron, comprised Emperor William, Prince and Princess Henry of Prussia, the Grand Duke and Duchess of Hesse, Prince Frederick Charles of Hesse, and other notables from the court. Thousands of spectators, brought to the scene of the race by special excursion trains, watched the contest, which was full of interest from start to finish.

At the end of the first round a German car was leading in 1:27:17, with Hautvest, the Belgian, close behind and Nazzaro third. At the end of the third round Hautvest was first, his time being 4:15:46. Nazzaro, however, was pressing him close, and on the last round forged ahead and captured the cup by the narrow margin of four minutes forty-four seconds. The prize consists of the Emperor's Cup, a vase and a table centerpiece from the royal porcelain manufactory at Charlottenberg.

Only two international races have been run in Europe this year, the Targa Florio and the German Emperor's race, in both of which Felice Nazzaro has been victorious. Last year he was second to Szisz in the French Grand Prix, and has twice figured



NAZZARO WEARING HIS HAPPY VICTOR'S SMILE.



NEAR SETTAMBOURG, WHERE THE RACERS WENT ALL OUT.

in the Vanderbilt Cup races. Nazzaro's racing career commenced in 1900, when he was mechanic to Lancia; for some time he was chauffeur for Vincenzo Florio, the donor of the Florio Cup. Up to this year he has never secured first position in any international event, though having driven in all of them.



URSEL'S NARROW STREETS CALLED FOR SKILLED DRIVING.

This second decisive Italian victory has considerably raised the chances of Fiat securing the Grand Prix, to be run in less than three weeks' time. Nazzaro, Wagner and Lancia are public favorites, as is indicated by bets on the race, even French sportsmen regarding their chances of victory as exceptionally bright.

START OF THE HERKOMER 1,140-MILE TOUR

LINDAU, GERMANY, June 8.—We have just finished the first three stages of the monster German endurance contest for the cup donated by Professor Von Herkomer, the auto-loving artist. Altogether the 198 machines furnished by Germany, Italy, France, Belgium, England and Switzerland are called upon to cover 1,140 miles on a closely calculated time schedule, to climb a few hills, give a good display of speed, show that they are comfortable and elegant, do not drink up too much water, have good tires—in short, to do all that an automobile can reasonably be expected to do. It is a complicated contest and one needs something of the Teutonic in his constitution to thoroughly understand the technicalities of the event.

Dresden, Saxony's ancient capital, was alive with automobiles the two days preceding the commencement of the tour. There seemed to be enough for every inhabitant, and certainly every inhabitant was as enthusiastic as if he owned one. At the Exhibition Palace there was a record crowd of royalty and dignitaries of every degree, and owners and chauffeurs chattering every language known to Europe.

Sharp-eyed officials pounced upon a bunch of machines, the bodies of which they declared had been doctored; ten Opels, fourteen Adlers and several Mercedes being told to retire on account of coachwork which contained too much aluminum under glossy layers of varnish. After protests, discussions and explanations the Opel and Adler heretics were allowed to run unofficially. The Mercedes were taken back into the fold, but the others, despite the vehement protests, were forced to remain in what was dubbed the "excommunication chamber." Twice Sorel and his French machine were sent away, once to have the road wheels completely varnished, and another time to repair a neglected detail of body work.

Altogether there were 134 official starters, but about thirty machines followed the tour though not recognized by the committee as competitors. Three ladies drove contesting machines: Miss Dorothy Levitt a six-cylinder Napier, Madame Lehmann a Metallurgique, and Madame Lili Sternberg a German machine. Sorel on a Lorraine-Dietrich led the procession—or, more correctly, he followed the official patrol car—and arrived first for lunch at Leipzig. At Eisenach, the end of the first stage, 225 miles, nearly all reported safely. Among the exceptions were

a Bianchi, which overturned outside the city, a Berliet which demolished a wall, a Porthos and a Beckmann in collision. Flowers, music and hurrahs greeted the competitors along the entire route, and native enthusiasm was shown everywhere.

At seven o'clock 142 machines started out from Eisenach for Mannheim, 210 miles distant, through picturesque valleys which we were unable to enjoy by reason of an annoying drizzle continuing to the lunch hour at Wurtzburg. There the sun broke through and the rest of the journey was magnificent. Dr. Rudolph Stoess, last year's winner, abandoned during the morning as the result of an accident to his steering gear. The car ran violently into a stone wall, with happily no injury to passengers. A 70-horsepower Stoewer—No. 13—driven by its owner, took a turn too quickly and capsized, the car being completely demolished, but the occupants free from injury. Sorel's Lorraine-Dietrich caught fire and was so seriously damaged that the loss of time in effecting repairs destroyed all chance of winning.

Through the Black Forest and along the borders of the Rhine was a magnificent run, enjoyed by all. One hundred and twenty-eight machines checked into Mannheim, the first one behind the pilot car being a Mercedes, driven by M. E. Landenburg, who won the trophy in 1905. In order to put down inconsiderate driving, five machines were disqualified for having caused accidents to other cars or users of the road.

Mannheim to Lindau, with a stop at Frenndstadt for lunch, comprised the third day's run of 232 miles. Good roads all the way, with some picturesque bits along the banks of Lake Constance, allowed of easy going. Two machines, however, dropped out of the morning run, and in the afternoon a number of accidents had to be recorded. A workman trying to save his dog from a car was himself knocked down and injured, a child was injured by a Porthos machine, a Bianchi ran into the parapet of a bridge, an Opel collided violently with a house and an Adler received serious injuries as the result of an encounter with a trolley car. Total number of arrivals at Lindau is 124.

Saturday night we shall reach Munich, remaining there all Sunday, Monday night we shall travel to Augsburg, undergoing a speed test en route, and on Wednesday evening we are timed to reach Frankfurt, where there will be a banquet, meeting of the jury, distribution of prizes, speeches, etc.

CLEVELANDERS HOLD CLIMB ON STUCKY HILL

CLEVELAND, June 17.—In spite of two postponements the annual hill climbing contest of the Cleveland Automobile Club pulled off Saturday was a tremendous success. As stated last week the property owners along the old hill at Gates Mills raised objections at the last moment and the club had to call the event off and cast about for another hill. Secretary Goddard, of the Cleveland Automobile Club, spent the greater part of the week scurrying about the countries within fifty miles of Cleveland looking for hills, and he finally located a good one.

The incline bearing the inelegant name of Stucky Hill is located thirty miles east of Cleveland on the road to the village of Chardon, a location which comes about as near being off the map as any place within a hundred miles of the Ohio metropolis. Not only was it a good hill, but it answered another important requirement in that it was so far removed from civilization that there are few people to complain if the dust was stirred up and the speed limits exceeded. City people who were unfortunate enough not to secure a seat in an automobile had to take the trolley line to Chardon and then drive—or walk—four miles to the hill. The villagers did what they could to provide transportation in the shape of farm wagons, hay ricks, etc., but the facilities were inadequate.

There were no objections from the country people. In fact, it proved an event which will long be talked about by the simple ruralties of Geauga County. The farmers for miles around laid aside their work and drove to the hill.

Timing and Other Arrangements Were Excellent.

The hill was a good one, about 7-10 of a mile long, fairly straight and made up of a series of pitches, there being three quite steep ascents, interspersed with long grades not so severe and lined with steep banks, which were fairly covered with the crowds. The club spent several hundred dollars in leveling off the rough spots and widening certain places, and in this they were assisted by the farmers who were very friendly.

The facilities for timing were perfect. In addition to the telephone line stretched over the course, a chronograph furnished by the Warner & Swasey Company, of Cleveland, manufacturers of astronomical instruments, was brought into play. This device gave a written record on a roll of the time each car spent in making the ascent. The outfit was situated at the finishing tape in a covered stand erected for the purpose. It was operated by and in charge of Walter Baker, of the American Ball Bearing Company, through whose courtesy it was provided.

The public interest shown in the event was evidenced by the fact that the Cleveland afternoon papers strung special wires from the hill to the village of Chardon, where operators were placed and repeated the reports, over other special wires by way of

Painesville, fifty miles to Cleveland. In spite of the terrific bursts of speed by some of the larger cars, there were no accidents.

The contests themselves were faster and more interesting and exciting than at any previous Cleveland contest. Walter White, in a special White steamer, wrested the honors for best time from the Stearns people, who in previous years have vanquished all comers in Cleveland events. But the Stearns people partly satisfied themselves by taking the cream of the events for stock cars of the heavier class. In his first attempt Walter White made the ascent in 58.5 seconds, and it looked like easy money for the big Stearns six cylinder, which had just been brought out. But on his second attempt White brought out another car, almost a duplicate in appearance to the famous "Whistling Billy" of track racing days. Nearby spectators said White's steam dial showed 1,600 pounds when he opened the throttle, and the car fairly jumped into the air. It was the quick starting of his car that gave White the advantage in every event. At hardly any time were the four wheels on the ground at once, and the judges at the finish estimated that the White demon was going ninety miles an hour when she crossed the tape on the comparatively level stretch approaching the finish. Frank Stearns did not drive his own car this year, but Frank Leland and C. Schilpp divided honors with the Stearns machines, both winning firsts, the former driving the new six-cylinder to victory. A. L. Campbell, in the Darracq of Vanderbilt Cup fame, covered the course in 51 seconds in the eighth event, but met with an accident in the free-for-all, while in the handicap he did 54. Herbert Lytle and E. Grady sent Pope cars up the hill in less than a minute. M. J. Roseboro, of the Ford Company, met with the greatest success of the day, winning three firsts, victories going to the six-cylinder roadster, the six-cylinder touring car, and the four-cylinder runabout. Henry Ford, of the Ford Company, went home jubilant after a remarkable afternoon's work. The Reo finished first in its class, but was deprived of another victory by the action of the committee in disqualifying one of the cars on the claim that it was out of its class. Jackson cars, under various drivers, carried off four firsts, and might have won a clean score in all starts had not C. M. Paxton met with a slight accident. The Stoddard-Dayton, in the light runabout class, won easily from a good field. The special event in which the Baker electric participated proved that an electric can be a remarkable hill-climber.

There were more than the usual number of protests. A Reo was ruled out in the second event and a Ford declared the winner. A Stoddard-Dayton protested against a Jackson in the fifth event, and these and other protests are still under consideration. The summaries follow:

AMATEUR CHAMPIONSHIP.

1. Stearns; driver, W. F. Hart.....1:20
2. Reo; driver, Al. Engel.....1:39



WALTER WHITE IN WHITE STEAMER STARTING RECORD CLIMB.



M. J. ROSEBORO AND HENRY FORD IN PRIZE-WINNING FORD.



A. L. CAMPBELL BRINGING THE DARRACQ UP THE STIFF GRADE.

STOCK RUNABOUTS UNDER \$850.	
1. Reo; driver, McGinnis.....	1:36 1-5
2. Ford; driver, A. B. Manley.....	1:49 2-5
STOCK RUNABOUTS UNDER \$1,500.	
1. Jackson; driver, Robert Burman.....	1:38 3-5
2. Reo; driver, C. R. Thomas.....	1:44 4-5
STOCK TOURING CARS UNDER \$1,500.	
1. Reo; driver, C. R. Thomas.....	1:46 1-5
2. Reo; driver, Al. Engel.....	2:08 1-5
STOCK RUNABOUTS UNDER \$2,000.	
1. Jackson; driver, R. Burman.....	1:32 4-5
2. Stoddard-Dayton; E. C. Ireland.....	1:32 4-5
STOCK TOURING CARS UNDER \$2,000.	
1. Jackson; driver, Robert Burman.....	1:34 1-5
2. Reo; driver, McGinnis.....	1:37 7-10
STOCK RUNABOUTS UNDER \$3,000.	
1. Ford; driver, M. J. Roseboro.....	1:13 1-5
2. Stoddard-Dayton; driver, E. C. Ireland.....	1:32 1-5
3. Jackson; driver, R. Burman.....	1:37 3-10
STOCK TOURING CARS UNDER \$3,000.	
1. Ford; driver, J. Kubeck.....	1:21 7-10
2. White; driver, Sculfe.....	1:27 9-10
3. Pope-Hartford; driver, J. Grady.....	1:29
STOCK RUNABOUTS UNDER \$5,000.	
1. Stearns; driver, F. Leland.....	1:03 3-10
2. Stearns; driver, W. F. Hart.....	1:13 1-5
STOCK TOURING CARS UNDER \$5,000.	
1. Stearns; driver, C. Schlipp.....	0:57 1-10
2. Pope-Toledo; driver, H. Lytle.....	0:58 9-10
3. Pope-Toledo; driver, R. Magoon.....	1:06 1-5
STOCK CARS OVER \$5,000.	
Stearns; driver, F. Leland.....	1:11 1-10
PISTON DISPLACEMENT, TWO CYLINDER.	
1. Jackson; driver, R. Burman.....	2:33
2. Jackson; driver, C. D. Paxon.....	2:33
PISTON DISPLACEMENT, FOUR-CYLINDER.	
1. Darracq; driver, A. L. Campbell.....	0:54 4-5
2. Stearns; driver, C. Schlipp.....	0:56
3. Pope-Hartford; driver, J. Grady.....	1:01 9-10
4. Pope-Hartford; driver, H. Lytle.....	1:03 3-5
5. Pope-Toledo; driver, R. Magoon.....	1:04



FRANK LELAND AND HIS STEARNS SIX THREE-EVENT WINNER.

6. Stoddard-Dayton; driver, A. Brooks.....	1:23
7. Stoddard-Dayton; driver, E. C. Ireland.....	1:32

Actual winners not yet decided by technical committee.

PISTON DISPLACEMENT, SIX-CYLINDER.	
Stearns; driver, F. Leland.....	1:14

CARS FROM 851 TO 1,432 POUNDS.	
1. Stoddard-Dayton; driver, A. Brooks.....	1:28 7-10
2. Reo; driver, J. McGinnis.....	1:36 1-5

CARS FROM 1,432 TO 2,264 POUNDS.	
1. White; driver, Walter White.....	0:47 2-5
2. Darracq; driver, A. L. Campbell.....	0:51
3. Pope-Hartford; driver, H. Lytle.....	0:59 3-5

FREE-FOR-ALL.	
1. White; driver, Walter White.....	0:48 7-10
2. Stearns; driver, F. Leland.....	0:52 9-10
3. Stearns; driver, C. Schlipp.....	0:57 3-10

SPECIAL FOR ELECTRICS.	
Baker; driver, Greunfeld.....	1:41 1-2

JERSEY'S HILL CLIMB TO BE REVIVED.

Ever since that annual Jersey fixture in the shape of the Eagle Rock hill-climb became a thing of the past through force of circumstances, there has been a demand for an event of this kind. Old Eagle Rock was a terror at first, but soon it became child's play to the modern car, so that it was far easier to talk hill climb than it was to find a bump that would be worth tackling. "Senator" W. J. Morgan thinks he has found it, though, in Schooley's Mountain, which was recommended to him origi-



"S" TURN ON SCHOOLEY'S MOUNTAIN, MORRIS COUNTY, N. J.

nally by Jefferson De Mont Thompson, of the A. A. A. racing board, as a most likely place. The grade is situated in Morris County, N. J., between Germany Valley and Hackettstown, and starts from the former village. It is 1 1-2 miles long, has three sharp turns in it, one of them a right angle, and is said to be the stiffest of its kind that Jersey can boast. At present it is liberally studded with water-breaks, but the inhabitants of both places are enthusiastic over the affair and have agreed to supply several carloads of crushed stone and clay to repair bad spots.

The "Senator" recently made a trip to the scene of coming conflict with a party of autoists and it has been decided to hold "The National Hill Climb" there on July 4. The hill is reached from Newark via Elizabeth, Chatham, Madison, Morristown, Mendham and Chester on fine roads, and the scenery alone is said to be well worth the trip. Entry blanks for the climb are now out and can be had from W. J. Morgan, Bretton Hall, Eighty-fifty street and Broadway, New York. The classes are as follows:

1. Stock cars, \$1,000 or under, gasoline power.
 2. Stock touring cars, costing \$1,500 and under, gasoline power.
 3. Stock touring cars, costing \$2,500 and under, gasoline power.
 4. Stock touring cars, costing \$3,500 and under, gasoline power.
 5. Stock touring cars, costing \$5,000 and under, gasoline power.
 6. Free-for-all stock touring cars, all powers.
 7. Stock touring runabouts, 30-horsepower and under, gasoline.
 8. Stock touring runabouts, 30-horsepower and over, gasoline.
 9. Stock touring cars, costing \$2,500 to \$4,000, all powers.
- MOTORCYCLES—THREE CLASSES.
10. Engines having not over 500 cc. piston displacement.
 11. Engines having not over 1,000 cc. piston displacement.
 12. Free-for-all.



ALL READY FOR THE START OF THE PARADE IN FRONT OF CHARLES M. SCHWAB'S RESIDENCE ON RIVERSIDE DRIVE.

THERE was a lot more joy in the loud seething tide of the great city, Wednesday, June 12, than on ordinary days. A kindly thought of "Senator" W. J. Morgan, a couple of years ago, put into motion a sympathetic wave which has spread to distant cities of the States and is even being felt in the far-away capitals of Europe. It was the New York Motor Club on Manhattan Island and the Long Island Automobile Club across the stream which undertook, with contagious enthusiasm, the material organization of the joy-giving thought. If Chairman S. A. Miles, upon whose shoulders the burden of the preliminary work fell, and who deserves great credit for unselfish devotion to his task, felt heavy and tired at the end of the day, and if those who deprived themselves of their cars from morn till night felt footsore, it was all forgotten in the remembrance of the happy two thousand orphans who were brightened by a visit to Coney's wondrous charms.

Joy began at 8 o'clock in the vicinity of Seventy-third street and Riverside Drive—more correctly its public demonstration began there, for many an orphan cot had held a restless head unable to slumber at the thought of the morrow's feast. Chairman Miles established his headquarters at the Hotel Chatsworth and got into telephonic communication with each of the institutions supplying the youthful guests. An usher was dispatched to each "Home" to report to the starting point how the cars were filling and how arrangements were progressing at his point of observation. There were a number of eleventh-hour repentants, whose cars were dispatched to pick up a load at the points most needing help, according to information sent over the wire by the ushers. When the report came through: "All well, last car left," from the

orphans' homes, the long procession was put into movement, a police patrol at its head, busy Chairman Miles and his committee in an advance-guard runabout, and a long string of 147 bedecked automobiles crowded with happy bits of humanity. Down Broadway to Brooklyn Bridge mounted police set a modest pace, while "General" Miles kept in touch with his moving army by means of an efficient motor-cycle corps which ran up and down the line of march with messages and reports. Over the bridge police motorcyclists replaced the horse-men; thus there was no scorching, no rush, just an orderly procession that moved along without a hitch. There was a puncture, but before the juvenile tears could flow a motor scout had run down the line and brought up one of the two empty reserve cars into which the youngsters were transferred. There was a lesson in the way the machines responded to the call for a six-miles limit for such a long distance, without any sign of overheating.

Franklin had the honor of being the most strongly represented in the run, Maxwell, Pierce, White, Packard and Locomobile following in numerical importance. Six commercial vehicles, two of them Packard delivery wagons, furnished by the Adams Express Company, one Logan, one Knox, an electric truck and a Fifth avenue 'bus attracted considerable attention with their loads of boisterous boys. A big Berliet with Arthur N. Jervis in charge, had a valuable consignment of 1,200 boxes of candy on board, the gift of J. A. McClurg. The car returned safely to New York, but never a bit of the candy again saw Broadway. Mrs. H. A. Lozier, who drove her own car with a lot of youngsters in it, was the only woman driver in the New York delegation. Samuel Brill, of the Automobile Club of America,



CHAIRMAN MILES WAS ACTIVE.



ANXIOUSLY AWAITING THE ARRIVAL OF THE AUTOS.



ORPHANS ARRIVE AT CONEY ISLAND IN FRONT OF DREAMLAND.

entered heartily into the spirit of the affair, and tied to the back of his automobile a sign reading, "Orphans' Day, To-Day Dreamland for Ours; To-night, Dreamland for Hours."

While the assembly was forming and proceeding oceanward from Riverside Drive a similar gathering was being formed over on Long Island, the number of orphans there being between seven and eight hundred. Some of them had a long journey, one party in particular coming from the Otilie Orphanage, at Jamaica, in ten cars. A Stevens-Duryea machine came all the way from Amityville. Mrs. A. M. Seaman and Mrs. Cuneo were the women drivers of the Long Island section.

New York's orphans drove direct to Dreamland, where a substantial meal was provided for them by the Harrolds Motor Company, of New York, and the George N. Pierce Company, of Buffalo. Naturally James A. McClurg's candy disappeared like ice under a summer sun. Brooklyn's fatherless youngsters were whirled along Surf avenue to Feltman's, where an army of waiters dispensed substantial meals, followed by ice cream and all sorts of dainties.

It was only necessary to be a wearer of the distinctive orphan badge to have all the gates of Coney Island swing open as if by magic. Airships, shooting the chutes, the Bay of Naples, miniature Switzerland, Bostock's wonderful animals, Kansas Cyclone, the Days of Forty-nine, and a host of others, were as free as the air and were enjoyed to the full, with repeat visits to those which delighted juvenility voted as extra fine.

"Al" Reeves came along and said, "Who wants ice cream?"

There was a fifty-throat yell of "Me! me! me!"

While the first batch was gobbling and chattering another child-lover "stood treat" to a second batch; a third did likewise, and a fourth followed suit. If any child remained ice-creamless it was because of a perverted taste.

It had to come to an end, as all good things do, and at five o'clock the little ones scrambled into their autos and were driven to the various institutions which shelter them. Not one accident and not a hitch. The arrangements would have been hard to improve upon.

"The car has not a scratch on it," said the enthusiastic owner of a new touring automobile. "I never saw a better behaved set of

children in my life. They shall certainly have the machine next year."

Speaking of next year, the children will probably not go to Coney Island, but will be given a longer ride into the country and a wild romp in the fields. More nature and less ice cream may be the diet for the fatherless, hundreds of whom have never been out of the crowded city. Cars will not be lacking. Orphans' Day has proved itself such a success that no owner will want to keep his auto for his personal use on the children's fete day.

HOW THE QUAKERS CELEBRATED.

PHILADELPHIA, June 17.—For a first attempt the Orphans' Day ride provided by the Quaker City Motor Club, seconded by the Germantown and Philadelphia clubs and the two local women's automobile organizations, was a very creditable performance. Unfortunately there was not enough of it, but 103 machines responding to the invitation of Chairman George H. Smith. At least 200 had been expected, and 250 had been hoped for.

One feature of the affair which might have been improved upon was the failure to mass the cars either going to Willow Grove or on the return trip. Not that a parade would have added much to the pleasure of either guests or hosts; but the sight of more than a hundred automobile, whose owners had dropped business for a day to provide an outing for upward of eight hundred unfortunates, might have had a softening effect upon the thousands of local automobile owners who could not or would not assist.

As early as eight o'clock automobiles began to report to headquarters at the Hotel Majestic, and, after being supplied with numbers for their cars and from half a dozen to a dozen tags numbered to correspond, were dispatched immediately to the various institutions providing guests for the run. Each car was filled to its capacity, and the drivers, who had carte blanche to select their own route, only being required to report at Willow Grove at eleven o'clock, gave their living load as run-about a ride as time permitted.

The Rapid Transit Company of Philadelphia, which owns and operates Willow Grove, heartily seconded the automobilists' efforts by throwing open all the attractions of the place from 11 to 1 o'clock. A chorus of harsh "bonk-honks" at 1:15 called



WHERE THE LITTLE STOMACHS WERE FILLED TO POINT OF BURSTING.



COMMITTEE CAR THAT LED THE WAY.

the little ones from the attractions of the grove to a bountiful luncheon, where second helpings were the rule, not the exception. By 3 o'clock all had been gathered again into the cars and were flying cityward.



CROSSING THE BROOKLYN BRIDGE.



THE PRESS CAR CARRIED SWEETMEATS.

youngsters had the time of their lives in the run to White City and Sans Souci Park, where the management had made special arrangements for their entertainment. Frank L. Albert turned the place over to them, and for a few hours the mimic

WORCESTER AUTOISTS GAVE HEARTY SUPPORT.

WORCESTER, Mass., June 17.—The Worcester Automobile Club voted early in April to have its third annual orphans' outing on the day named by the A. A. A. at National Orphans' Day.

Forty-seven cars carried 329 orphans from St. Anne's Orphanage, St. Gabriel's Orphanage, Temporary Home and Day Nursery, Neighborhood House and Memorial Hospital around the city for an hour, then took them to Lincoln Park, at Lake Quinsigamond, where President Francis P. Dewey, owner of the park; J. W. Gorman, manager of the theater; J. P. Irwin and George Gett, representing the amusements, gave a hearty welcome to the motorists and their charges. After an hour of the charms of the park the children were taken for another ride around the city and then to their homes. Many of the leading business men of the city drove their cars in the run, while others sent their machines in charge of chauffeurs. All but two of the garages of the city were represented.

RAIN, BUT PLENTY OF FUN, AT CHICAGO.

CHICAGO, June 17.—It rained at Chicago on National Orphans' Day, but Chicago's thousand youngsters, in 125 automobiles, did not mind that. Three associations looked after the interests of the fatherless—the Chicago Automobile Club, the Chicago Motor Club and the Chicago Trade Automobile Association. Starting from the Auditorium Hotel early in the afternoon, the excited

steamer, shooting the chutes, the ice cream and the candy stalls had a strenuous life. Just as the sun came out for the first time in the day the youthful party was again embarked on the machines and trundled back to their homes. Alderman F. W. Taylor, from the Twenty-first Ward, acted as grand marshal of the day. In the eyes of the majority the most important official was Commissioner-General Richard Bacon, Jr., who appeared with a large auto truck piled high with crates of crackerjack and peanuts.

GRAND RAPIDS SUCCESSFULLY CELEBRATES.

GRAND RAPIDS, Mich., June 17.—Orphans' Day in Grand Rapids was a splendid success, in spite of the fact that when the machines left the asylums it was raining hard. Fifty big machines, enough to carry comfortably the 170 orphans of the city, were loaded by two o'clock, and the eight-mile run to the Cascade clubhouse was made without mishap. The children were there given the freedom of the clubhouse, had games by the river, and were provided with a bountiful repast before their return. The committee in charge consisted of Dr. Perry Schurtz, Orin Stair and Dr. J. E. Meengs.

BALTIMORE HAS 175 CARS IN LINE.

BALTIMORE, June 17.—The orphans of the Monumental City were the guests of the Automobile Club of Maryland on Orphans' Day, when 175 cars were used for their entertainment. Refreshments were furnished at Electric Park.



HOW THE LONG ISLANDERS TRANSPORTED THE ORPHAN BOYS' BAND OF SIXTY-FOUR PIECES.

PREPARATIONS COMPLETE FOR THE GRAND PRIX

PARIS, June 12.—With but twenty days separating us from the Grand Prix, for that much-advertised event is to be run on the Dieppe circuit on July 2, the Sporting Commission has now got down to details of organization. Racing cars have not been seen on the circuit since the beginning of the month, and those tourists who wish to make acquaintance with the fast course have their speed ruthlessly cut down to thirty kilometers an hour by vigilant gendarmes.

Salting the course was not considered sufficiently reliable to keep down dust, and the more costly but more reliable method of tarring has again been resorted to. The work is now terminated, not without a little criticism, Szisz in particular being of the opinion that it might be more thoroughly done on the turns.

It will be promptly at six o'clock that Lancia, who has drawn No. 1, will be sent away, the others following at intervals of one minute, whether a car is passing the grand stands at the time or not. Being on the loop road, there is no danger of a new starter coming into collision with a machine finishing its first round. Arrangements are completed for placing soldiers around the course; 4,000 men from line regiments, 400 horsemen, 300 foot gendarmes, and 300 mounted gendarmes—a total of 5,000 troops—will be distributed around the circuit. In open portions of the country there will be a soldier every hundred yards on each side of the road, with much stronger forces in the villages and on the turns. Sixty commissaires, appointed by the A. C. F., will also be spread round the course to observe the enforcement of the rules. At least twelve temporary bridges and tunnels will be specially constructed to unite the inside with the outside of the circuit before and during the race.

The nine Sporting Commission racers to compete among themselves during the Grand Prix contest, will be started at nine o'clock and at intervals of five minutes. Not until five o'clock in the evening will the triangular course be again open to the public; even then no vehicle may travel, except in the direction in which the race has been run. At six P. M. the course will be entirely free to all comers.

There is every possibility of the Dieppe course being adopted as a permanent course for the races held by the Automobile Club of France. The question will be discussed at the next meeting of the committee. Under the present system of a new circuit every season the club is led to an enormous amount of expense, for, no matter how good the roads are, there is a certain amount of work to be done in building temporary bridges, barriers, grand stands, and widening and improving the road where necessary. Last year \$11,000 were lost on the Grand Prix, and the Gordon Bennett race in Auvergne was far from being a profitable affair.

Members of the Technical Commission of the A. C. F. have been paying particular attention to the effect of fast cars on the road surface, both on straight stretches and on the turns. A close examination of the course will be made the day before and the day after the race in order to obtain accurate information on the effects of tires at high speeds. Information thus gained will be particularly valuable to the parliamentary commission concerned with automobile regulations.

Though no official announcement has yet been made, it is generally thought that Bayard-Clément will not be represented in the Grand Prix, in consequence of the unfortunate death of Albert Clément. Darracq, who for a time appeared likely to be an absentee also, will be in full force. The accident which cost the life of Marius Pin, at Rambouillet a few days ago, only caused slight damage to the racing machine, and M. Hériot, the owner, has offered it to Rigal, who has accepted, to drive it in the race. In accepting the offer Rigal declared that he would give half his engagement fee and half of whatever prize money he gains on the race to the widow and children of Marius Pin. Caillois and

Demogeot are the appointed drivers of the two other Darracqs, though there is still the possibility of a change being made in the selection of Demogeot. With but few exceptions all the competitors for the Grand Prix, some of whom have been round the course thirty or forty times, are loud in their praise of the circuit. Jenatzy predicts an average of from 63 to 65 miles an hour, which opinion is generally shared.

RIVES BUSY ON NEXT FRENCH SHOW.

PARIS, June 12.—Gustave Rives, the master mind of the Paris Automobile Salon, has promised an interesting retrospective exhibition at the next show in the Grand Palais. The time is particularly opportune, for next year's show is the tenth in an uninterrupted line of succession, and will in consequence be particularly brilliant. Last year a retrospective cycle exhibition formed one of the attractions of the Salon, but the coming one, devoted to motors, boats and flying machines, is certain to surpass it in interest. Among the important relics already secured are the first tricycle and the first voiturette produced from the then tiny De Dion factory, the Panhard machine which won the Paris-Bordeaux race in 1895, Jenatzy's "Jamais Contente," a Renault voiturette victorious in the Paris-Amsterdam-Paris of 1898, racers having participated in the early road races of Paris-Toulon, Paris-Madrid and Paris-Berlin, in addition to a number of racing machines victorious in international contests. In addition to the racers will be a series of touring cars showing the progress made from the earliest attempts to the present day. Motor boats and flying machines will be represented in the same way.

An elegance competition, to be held during the show, will prove as interesting to private users as to manufacturers. Its object is to develop the production of comfortable, elegant town vehicles, free from vibration, smoke and noise, graceful in design, comfortable for travel and artistic in finish. Elegant town vehicles have been quite a feature of the Paris automobile industry during the past two or three years, engineers and body builders having combined to produce the highest grade of town vehicle, having all the *chic* of a costly horse turnout, with none of its shortcomings.

RUSSIA HOLDS A ROAD RACE AND A SHOW.

ST. PETERSBURG, June 10.—Twenty-seven machines—heavy racers, light cars and motorcycles, started on the 434-mile road race from Moscow to St. Petersburg, the first of its kind held in the country, and which was one of the outside attractions of the automobile salon held with so much success and enthusiasm in the Manege Michel. Starting from a point two miles outside Moscow, the first machine was sent away at 2 A.M., the others following at intervals of two minutes. A large crowd was present at the start, recalling somewhat the condition which governed the start of the ill-famed Paris-Madrid race. Fortunately, however, there were no accidents. For 200 kilometers the road was guarded by Cossacks, and gasoline and tire stations were placed along the entire course at intervals. The first half of the distance was over excellent roads, but the latter half was on tracks that caused considerable difficulty to nearly all the machines. Duray's average of 46.4 miles an hour and the 30-horsepower Charron's average of 37 miles an hour are good performances under such conditions. The following is the classified result:

Lorraine-Dietrich, Duray, 9:22:0 (average, 46.4 miles an hour).
C. G. V., Champoiseau, 12:53:0 (average, 37 miles an hour).
Fiat, Folkin, first in second class, 14:18:0.
Mors, London, 14:20:0.
Brasier, Schwartz, first in tourist class, 14:28:0.
Argus, Menoff, 15:7:0.
Darracq, Jemlitchka, 15:32:0.

EUROPEAN RAILWAY MOTOR CARS*

By B. D. GRAY, AMERICAN LOCOMOTIVE WORKS.

AS a result of continued and consistent experimentation, covering a period of four years or more, conducted by numerous English and Continental railways, the self-propelled railway car has been brought to such a degree of refinement that it has become an important and established factor in the transportation of passengers and light goods traffic. While its inception dates back many years—experiments along this line having been made as early as 1873—the successful development of the self-contained car is quite recent. Owing partly to the crudity of early designs, but largely to under-estimation of its possibilities and lack of appreciation of the necessity for frequent and rapid train service, and because the demands of the traveling public were not nearly so exacting as at present, the early experiments were probably premature; but the phenomenal growth of our large cities, the grouping of commercial interests, and the ever-present desire for home comforts, have removed residence districts from business centres and brought about the necessity for efficient suburban and interurban transportation facilities. Greater demands upon business men's time have likewise contributed to the necessity for rapid transit. The influence of metropolitan activity is felt in the smaller cities and provincial towns, and extends even to the most remote country districts.

In the United States electricity has been widely adopted as a motive power, and has met with marked success the demands for quick and reliable service. Electrification of existing steam roads and the building of new electric lines have not been taken up so generally in Europe, and it is therefore only natural that the engineers of those railways should look for the solution of the frequent service problem in a vehicle which might be adapted to existing conditions with no expenditure for equipment other than that for the vehicle itself. This condition of affairs probably influenced recent builders of motor cars in selecting steam as a motive power, although its predominance at the present time is due chiefly to its low fuel cost and great flexibility.

Numerous English and Continental railway companies have permanently established motor car service on their lines in different localities, with marked success. The practicability of the self-contained car for certain kinds of service can no longer be doubted, nor is its field so limited as might be generally supposed. One may see such cars operating on unimportant branch lines as feeders to trunk line trains; on main lines through thickly populated districts, carrying passengers and luggage to and from the more important towns served by express trains; on suburban lines in competition with both trolley cars and steam trains, on an entire railway system, where there is no other means of transportation except for heavy freight.

What the Adoption of the System Means.

Its adoption permits better service, with greater frequency, at lower cost of operation, than is possible with the ordinary steam train, comprising a locomotive and one or more passenger coaches or combination cars, the lower operating cost being due chiefly to decreased fuel consumption and a reduction in the train crew. Motor car equipment is cheaper to install than ordinary train equipment, therefore fixed charges on the investment are correspondingly less. Maintenance charges on rolling stock are about the same in both cases, but track maintenance is less where motor cars are used because of decreased weight.

As compared with electric railways for interurban service, where current is supplied from a central station, the relative economy depends chiefly upon the frequency of the service. Taking into account the cost of equipment, installation, operation, current losses, etc., it is fair to assume that where cars are to be

run at thirty-minute intervals or less the electric railway is the most economical, but where car or train intervals are greater than thirty minutes, the balance is in favor of the self-propelled car.

The London & Southwestern Railway was one of the pioneers in the movement for self-contained cars, and in 1903 placed a steam car on their line between Fratton and South Sea. This car was equipped with small cylinders and vertical boiler, and, while not capable of high speed or quick acceleration, the results obtained were satisfactory from the standpoint of economy of operation, and probably encouraged more than anything else other railways to take up this problem. This car has a total length of fifty feet and seats forty passengers. The cylinders are inclined, driving the leading pair of wheels only.

One of the most satisfactory cars in operation abroad at the present time is the one developed by Mr. Churchward, chief engineer of the Great Western Railway of England. In the neighborhood of sixty of these cars are in service on various parts of the Great Western system, and others are in course of construction. They combine to a remarkable degree many of those qualities essential to success—large seating capacity with only moderate weight, flexibility of control, reasonable speed and acceleration, reliability, low maintenance and fair operating costs. The boiler is of the vertical fire-tube type, with no superheater, supported directly on the frame of the power truck, and serving as a centre pin by transmitting the driving effort to the sills of the car through flat springs. It is enclosed within a compartment of the car body about fourteen feet long, which contains the coal bunkers, operating levers, etc. As the car is arranged to run in both directions and is controlled from both ends, a stoker is employed in addition to the driver. Aside from attending to the fire, it is his duty to regulate the cut-off when the driver is at the other end of the car, as only brake and throttle connections are provided there. The motor consists of two single expansion cylinders 12x16 inches, coupled direct to the rear driving wheels, which in turn are coupled to the front drivers. Air brakes are provided, the usual form of steam-actuated automatic pumps being used to supply the air. The water supply is carried in tanks hung beneath the car body midway between the trucks.

As an indication of the reliability and commercial success of these cars, the following instance of service conditions may be cited: Two motor cars and four or five trailers are used on the main line of the Great Western between Chalford and Stonehouse, a distance of about seven miles. The railway at this point runs through what is known as the Stroud Valley, a thickly populated section comprising in all about 40,000 inhabitants in the nearby towns and outlying districts. The motor car schedule provides on an average fourteen round trips per day (a total of about 200 miles), so arranged as to run these cars between through trains, both passenger and freight. There are ten stops in the seven miles, and the running time each way is from twenty-three to twenty-five minutes.

These cars are capable of a maximum speed of fifty-five miles an hour, although the average running speed is thirty to thirty-five miles an hour. Their maximum acceleration is about one mile per hour per second.

The original cost of the type of motor car shown in Fig. 1 is about \$9,000, and the cost of operation, aside from the guard's pay, is 13 cents per car or train mile, including trailers, for the service above referred to, the coal consumption being about 20 pounds per train mile.

An English Gasoline-Electric.

About three years ago the North-Eastern Railway of England put into service two "petrol-electric" cars on a short line running out from Scarborough. Owing to the fact that traffic on this line

* Extract from paper presented at the Indianapolis meeting of the American Society of Mechanical Engineers.

is heavy during the summer season only, these cars are laid up during the winter, and have, therefore, not been in continuous service. One gallon of gasoline to $3\frac{1}{2}$ car miles is claimed for them, but the maintenance charges must necessarily be high.

The power plant consists of a four-cylinder horizontal opposed Wolsley engine, $8\frac{1}{2}\times 10$ inches, 85 b. h. p. at 420 r. p. m., direct connected to a compound-wound separately-excited generator of 55 kilowatt capacity, which furnishes current to two 50-horsepower electric motors of the ordinary railway type, on the leading truck. The exciter, of 3.75 kilowatt capacity, is mounted above the main generator and driven by a belt from the flywheel of the engine. In addition to exciting the fields of the generator, it is used to charge a storage battery, which supplies current for lighting the car, starting the generator and gasoline engine, and for a small automatic compressor motor, which supplies air for the whistle. The battery and compressor outfit are suspended beneath the car body. The engine and main generator are very cumbersome and heavy, and occupy practically one-third of the total length of the car. The total weight, including 60 gallons of gasoline and about 100 gallons of cooling water, is 35 tons, of which 22 tons are carried on the power truck.

Radiating pipes located above the the engine room, and supplied with air by a horizontal fan, in addition to that due to the motion of the car, serve to cool the jacket water. For extremely warm weather, an additional coil extending along the roof is provided and pipes are also arranged inside the car to be used for heating in cold weather. Electric brakes are used, the current being supplied by the motors acting as generators. Controlling apparatus is provided at both ends of the car, and only two men are required to operate—motorman and guard. The wages paid are about 7 and 6 shillings per day, respectively.

The complications of this system, the multiplicity of parts, and the excessive weight give a rather unfavorable impression. The combined efficiencies of the generator and motors must of necessity be low, and their use can only be reconciled with the extreme flexibility of transmission necessitated by a large unwieldy gasoline motor. As this particular type of car has not been perpetuated by the original builders and users, it may be safe to assume that it is not entirely satisfactory. It is the author's opinion that its indifferent success is due to the enormous size and weight of the power plant throughout, as a number of cars embodying practically the same principles, but of much lighter construction, have been in successful operation in Hungary during the past three years.

Some Types on French Railways.

Numerous experiments have been made on the different French railways, including the Paris-Orleans; Paris, Lyons & Mediterranean; Northern; Western and the State railways, with various types of cars, but the most successful at the present time, and the one being almost universally adopted, is that of Purrey, of Bordeaux, and although differing in minor structural details, the power plants of the Purrey cars as built by the different railways are practically the same. There is also a slight variation in the size, weight, and arrangement of cars to best meet the requirements of the different roads, but that of the Paris-Orleans Railway is fairly representative of all the cars used in France.

The car body has a total length of about 60 feet, and seats 30 third-class passengers in three compartments, and 25 first-class passengers in 2 1-2 compartments. In addition to this, there is a baggage compartment at the forward end 11 feet 6 inches long and extending the entire width of the car, 112 inches. The forward end is pivoted on a power truck, the rear end being carried upon a single axle. The power truck, which carries the boiler, motor, fuel, water, etc., has two axles 126 inches apart, the rear wheels only being used for driving. The weight of this truck is 14 1-2 tons, of which about 7 tons is on the rear axle. The total weight of the car complete is about 35 tons.

The motor is four-cylinder tandem compound, high pressure 6 5-16 inches diameter, low pressure 8 11-16 inches diameter, and

the stroke 8 7-8 inches, rated at 260 horsepower at 650 revolutions per minute. A bypass valve is provided to admit high pressure steam to the low pressure cylinders for quick acceleration and unusually heavy pulling. Ordinary D type valves are used, operated through Stephenson link motion. In this design, the motor is attached horizontally to the frame of the car, and its power transmitted to the rear axle by two toothed chains of special construction, similar to the Renold and Morse silent type. All the working parts are enclosed in a dustproof case, and lubricated principally by splash. The motor is accessible through a trap door in the floor of the baggage compartment, and any ordinary adjustments can be made from this point. A door is also provided opening into the baggage compartment, through which the boiler tubes may be inspected, thus rendering the most delicate parts of the mechanism readily accessible. Should it be necessary to overhaul the boiler or motor, the power truck may be removed from the body of the car in 20 minutes and another substituted in its place. Westinghouse air brakes and hand brakes are used.

The Paris-Orleans road have 10 cars and 12 power trucks, and have been able to keep the 10 cars in service practically all the time by having the two extra trucks in reserve. As a rule, one or two trailers are attached to these motor cars, the average weight of the train being 50 tons. The fuel consumption for such a train is about 21 pounds of coke per mile.

This car is arranged to run in one direction only, except for backing up, and the crew consists of only the driver and one man in the baggage compartment, tickets being taken at the stations by inspectors. It is geared rather high, and is capable of running at a speed of about fifty-six miles per hour. Its acceleration, however, is not so good as that of the Great Western car.

The Orleans road has instituted a motor car service between Bourges and Saincaize, a distance of 59 kilometers (37 miles), the run being made in 70 minutes, including eight stops. Sufficient fuel and water capacity are provided for a run of 50 kilometers.

The Purrey system has been used for a number of years on different tramway lines in the city of Paris, but for this service it has been found that the single expansion engine gives better results than the compound, and also that there is no advantage in having a variable cut-off, owing to the frequency of the stops, the speed of the motor being controlled entirely by the throttle valve, no adjustments being necessary for starting.

Arad Csanadar Railway of Hungary.

One of the most interesting examples of successful operation of railway motor cars on a large scale is that of the Arad Csanadar Railway of Hungary. Three years ago a Ganz steam car was put into service on this road in an experimental way, and the results were so satisfactory that the management decided to replace their locomotive and train service, for passenger and light goods traffic, with the self-propelled car, and have gradually added to their motor car equipment until now they have a total of 37 cars of which 4 are Ganz steam cars 35 horsepower of the de Dion system; 22 are gasoline-electric 30-35 horsepower of the de Dion Bouton system, constructed by Johann Weitzer; 10 are gasoline-electric 70 horsepower of the de Dion Bouton system; one is gasoline 40 horsepower (German Daimler).

The total length of this railway is about 400 kilometers, single track, running for the most part through a sparsely populated agricultural district, where conditions are conducive to economical operations, as the average Hungarian peasant is not very fastidious nor exacting in the matter of luxuriously furnished cars or rapid transportation. Their cars are of very light construction, and, being run at low speed, require small power plants in which the fuel consumption is comparatively low. Only the heavy freight traffic is handled by steam locomotives, and in 1906 the motor cars covered a total of about 1,000,000 miles, in most cases hauling from one to four trailers.

The improved service offered by the motor car has stimulated traffic in that section to such an extent that within the past two

years it has doubled. One of the most remarkable features in connection with the success of this railway is the extremely low fares, which average about 1-3 cent per mile, and yet the road pays 8 1-2 per cent. on the investment of \$6,500,000 after paying 19 per cent. of the total receipts to the government as a tax.

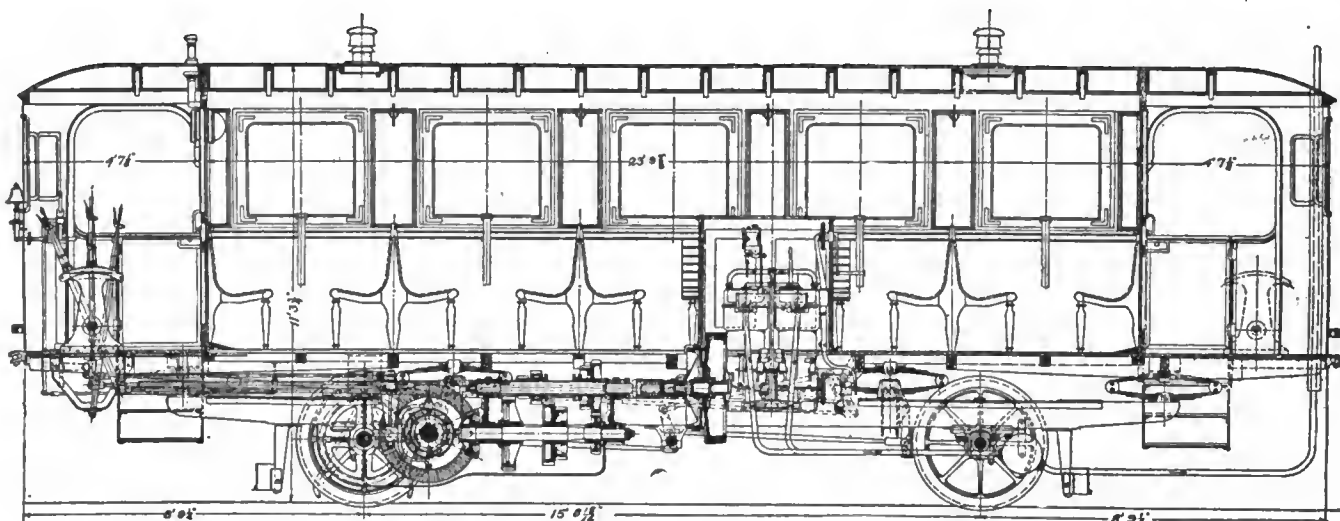
The larger gasoline-electric cars used by this railway are equipped with a 70-horsepower gasoline motor direct connected to a 45-kilowatt generator, which supplies current to two ordinary railway type motors attached to the two axles. The usual series parallel controller is provided for starting. After the car is once under way, its speed is controlled almost entirely by the throttle of the gas engine. At the right of the electric controller are two smaller levers, one of which connects with the throttle, and the other with the spark advance mechanism. In addition to these, there is a small rheostat provided within easy reach of the operator, which serves to vary the field strength of the generator, and thus gives an additional means for controlling the car during the acceleration period. Controlling apparatus is provided at only one end of the car, as it is intended to run in only one direction except for shunting. Bocker air brakes and hand brakes are provided, air being supplied by a small compressor driven from the outer end of the armature shaft. An air whistle

the other supported elastically from the truck frame. Control is provided at only one end, and only one man is required to operate the car. The 35-horsepower car has a seating capacity of 22 first-class and 12 second-class passengers. Its over all length is about 35 feet. A speed of 35 miles per hour is claimed for this car with a fuel consumption of 5.3 to 7.2 pounds of coke per mile. The same consumption is claimed with trailers weighing from 35 to 40 tons at a speed of 12 1-2 miles per hour.

Details of the Motor.

Ganz motors are two-cylinder cross compound, the one used with the 35-horsepower boiler having cylinder diameters of 4 9-16 inches and 6 11-16 inches and common stroke of 4 3-4 inches. Two steam operated feed pumps are provided, one being held in reserve.

The 80-horsepower car has a total length of 46 feet, seats 47 passengers, weighs 23 tons, and is capable of climbing a 1.6 per cent. grade with two trailers weighing 12 tons each, at a speed of 25 miles per hour. One peculiar feature of the Ganz system is the double gear reduction between the motor and the axle. Two spur gears are mounted loose on the crankshaft between the two cranks and meshing with gears keyed to the axle. A jaw clutch



SECTIONAL ELEVATION OF GERMAN DAIMLER GASOLINE CAR THAT IS MUCH USED ON THE SMALLER GERMAN RAILWAYS.

is used. Acetylene gas is used for lighting. Coils are provided along the sides of the car for heating, the jacket water from the motor being used for this purpose. In warm weather the jacket water is passed through a coil of tubes on the roof at the forward end where it is exposed to the air.

The space occupied by the power plant is considerably less in proportion to the length of the car than that of the Great Eastern, although the systems are practically identical in principle. Its acceleration is very good indeed, and its maximum speed is about 35 miles per hour without trailer, and with two trailers about 25 miles per hour. More than two trailers are never used with the 70-horsepower car, as it is used for express service, but the smaller cars, equipped with 35-horsepower motors which run very much slower, frequently haul as many as four trailers. It is claimed by the engineers of this road that 65 per cent. of the motor's power is delivered at the wheels. In general very satisfactory results are obtained and the car is admirably adapted to their conditions.

The Ganz cars are manufactured in three sizes, 35, 50 and 80 horsepower. The general arrangement is the same in all three, the boiler being placed in a compartment at the forward end of the car, together with fuel bunker, feed pumps, and controlling apparatus. The motor is placed horizontally on the leading truck, and drives the rear axle through spur gears. It is supported in the usual electric railway motor style, one end being swiveled about the axle and

positively driven is provided between the driving gears, and so arranged as to engage either one or the other when moved along the shaft. The ratio of reduction is about 2 to 1. As a rule, the low gear is used when the trailers are attached and for heavy grades.

The Serpollet system differs from the Purrey and Ganz types chiefly in that the boiler is of the flash type, and kerosene is generally used as fuel. A very high degree of superheat is obtained, reaching even 1,200 degrees F., which, together with the incrustation attending the use of more or less impure water is conducive to the burning of tubes. The experience of the Paris, Lyons and Mediterranean Railway with this type of car has been rather unsatisfactory, because of tube troubles, and the Purrey car is now being adopted in its place.

The Komarek car, manufactured by F. X. Komarek, Vienna, and used to some extent by the Austrian State railways and several of its branches, is one of the most rational in design of all in use abroad. Its builders may have erred slightly on the side of weight, but it shows remarkable economy and unusual freedom from repairs and troubles of all kinds.

This car is capable of running at a speed of 25 miles per hour on a level while hauling trailers comprising a total of 50 tons. The operating cost is said to be about 5 cents per train mile exclusive of the guard's pay, with coal costing \$3.25 per ton.

In general, the arrangement of the four axle car is similar to

the Purrey with the forward end of the body supported on the power truck. Other types with two and three axles have the boiler in a compartment at the forward end of the car body, supported by the main body frame. The motor is practically a small cross compound locomotive with outside cylinders, driving on one pair of wheels only. A vertical water tube boiler of special construction is used. To provide for expansion, the inner shell is corrugated, and the tubes are accessible for cleaning and renewal through plugs and manholes in the outer shell. A superheater coil is placed in the upper part of the furnace, and heated by the exhaust gases, the degree of superheat averaging about 300 degrees F.

German Daimler Gasoline Car.

This type of car has been used in considerable numbers on some of the smaller German railways, notably the Württemberg State Railway and on the Swiss Federal Railway. It is a comparatively small car having a total length of 33 feet with a seating capacity of 36. It is equipped with a 30-horsepower Daimler four cylinder (5 1-4 by 6 3-4 inch) engine of the heavy slow speed type, its normal speed being in the neighborhood of 550 revolutions per minute. The motor is located practically in the middle of the car, projecting upward through the floor to a considerable height, and inclosed by a wooden box. It is rigidly attached to a sub-frame, on which the car body is supported by eight elliptic springs, the sub-frame being carried rigidly on the two axles. Power is transmitted from the motor through a leather-faced cone friction clutch, and through a sliding gear transmission, arranged to give four speeds and reverse, to one of the axles. Control levers are provided at either end of the car, by means of which the speed of the motor may be controlled, gear changes made, and also the direction of motion reversed. When the driver leaves one platform to go to the other, the gear levers are locked in a neutral position. Their connections to the gear case then serve as fulcrums for the operating levers and their connections at the other end of the car. The transmission is extremely heavy and the gears somewhat difficult to shift. They are not entirely protected from dust and therefore subject to rapid wear. The cone clutch requires considerable attention to secure smooth operation. If neglected, it takes hold with such brusqueness that jerking of the car results, to the extreme discomfort of the passengers. One of these cars has been in service on the Arad Csanadar Railway but has been practically abandoned because of the clutch and gear troubles.

Several years ago the Daimler Motor Company, of Coventry, England, built a number of small railway cars of the straight gasoline type, equipped with two 30-horsepower motors, carried on a sub-frame between the axles. They were placed at diagonally opposite corners of the frame, and a sliding gear transmission provided, centrally located and so arranged that either or both motors could drive through it, and thence through bevel gearing to the two axles. These cars have not been satisfactory because of clutch and gear troubles, and because they were rather expensive to operate, the fuel cost being high. The usual friction clutches interposed between the motors and transmission permitted the use of either one of the motors independently of the other, a feature which may possess merit in minimizing fuel consumption, and in being able to proceed with one motor if the other for any reason becomes inoperative. Two axle cars, such as the German and English Daimler, are not applicable to all kinds of service because of the long wheelbase, which is 15 feet 9 inches in the case of the former and 15 feet in the latter.

Some Remarks in Conclusion.

The author's impressions of the railway motor car situation abroad, gained from personal observation of the leading types herein described in operation, and from personal interviews with railway officials and others more or less directly interested, may be summed up as follows:

The field of the railway motor car is very broad indeed. It has always demonstrated its superiority over the ordinary steam train,

in making possible more frequent service at lower operating cost, as a feeder to express trains, on branch and main lines, in either very thickly or very sparsely populated districts. It has successfully competed with electric cars of both trolley and storage battery types, in suburban and interurban service. In the case of the Arad Csanadar Railway, it has replaced steam trains on the entire system except for heavy freight. Further refinement is possible and may be expected, which will extend its field of usefulness. Steam, as a motive power in cars of 80 horsepower or over possesses the greatest number of advantages, among which may be named flexibility, reliability and economical operation. First cost is also in favor of the steam car, and likewise to a slight extent maintenance charges.

For cars of less than 80 horsepower the internal combustion motor shows lower fuel cost than the steam car of like power. Present well-known forms of gear transmission with friction clutches which are entirely successful on gasoline automobiles are not suitable for heavy cars because of their inelasticity and the enormous difference in inertia of weights dealt with.

Electric transmission possesses the required flexibility and seems best adapted for the purpose.

A BANNER YEAR FOR AUTOMOBILE EXPORTS.

It is evident that 1907 is to be a record-breaking year in the exports of automobiles and that its total will top the \$5,000,000 mark by a substantial margin, for according to the last report of the Department of Commerce and Labor, the aggregate for the period of ten months ending with April, 1907, was \$4,104,737. As the total for the month of April alone represented \$686,144, there seems to be every possibility that the figures for the fiscal year will be nearer the six million mark than the five. No less than 397 complete cars were exported, of a value of \$638,014, the balance of \$48,130 representing the value of parts sent abroad during the same month.

The rate of growth may be appreciated by the fact that these figures represent an increase of more than sixty per cent over the total for April a year ago, which was but \$408,383, while some idea of the manner in which the exports have grown from year to year may be had from the figures of the periods of ten months ending with April in the past three years, which were \$1,876,063, \$2,473,207 and \$4,104,737 for 1905, 1906 and 1907, respectively.

Just where all these cars and the vast quantities of parts find a ready market is interestingly revealed by the detailed table, which moreover brings to light the startling fact that the bulk of the increase in American exports is to be found in the figures represented by the takings of those countries which are automobile producers themselves, and as such, strenuous competitors for the world's trade. For instance, both England and France show increases of considerably more than 100 per cent, and the difference is not merely one of percentages, as the amounts are substantial, as will be seen upon reference to the table. The same is true of other Europe, while both Germany and Italy show proportionately great increases.

The detailed table follows:

	April 1906	April 1907	Ten Mos. Ending 1906	April 1907
Automobiles, and parts of—				
Automobiles	408,333	\$688,014	\$2,437,207	\$3,603,298
Parts of		48,130		501,439
Exported to—				
United Kingdom	74,746	174,277	616,177	983,921
France	31,375	81,230	170,601	358,648
Germany	11,517	17,048	57,259	102,556
Italy	55,960	79,392	227,588	206,519
Other Europe	20,774	50,658	123,233	216,918
British North America	82,133	174,448	435,850	870,332
Mexico	91,881	64,409	293,002	692,652
West Indies and Ber-				
muda	4,262	11,752	224,676	183,552
South America	9,748	11,214	61,780	170,270
British East Indies	2,313	7,003	31,046	33,086
British Australasia	18,504	3,511	148,124	189,454
Other Asia and Oceania	8,829	7,264	44,096	76,976
Africa	831	.....	26,925	8,673
Other countries	970	3,938	12,850	12,180
Total automobiles, and parts of.....	\$408,333	\$686,144	\$2,473,207	\$4,104,737

GENERAL POINTERS FOR THE NOVICE OWNER

By CHARLES B. HAYWARD.

WEATHER conditions have been responsible for delaying it considerably, but it seems to be about due now if ever—that annual deluge of advice that is hurled at the head of the unoffending beginner. It is a hardy annual that does duty as a space filler year after year, usually appearing in much the same form, so that each succeeding crop of *don'ts* and *musts* are as like as grains of wheat from the same field, but the demand continues strong, nevertheless, which is easily accounted for by the largely increasing army of beginners that comes on the field each spring, anxious to devour every available bit of information to be had. The man to whom, the year previous, the technical pages of an automobile weekly were so much Sanscrit, is frequently the individual who develops such an amazing appetite for matters rudimentary concerning the handling and maintenance of his car that the demand for articles of one syllable, so to speak, is readily explained.

Naturally enough, about the first thing the proud owner wishes to know and familiarize himself with is the matter of breakdowns. Pride of possession and the smoothness of its performance at first banishes all thought of such a thing as the possibility of his dream of a car ever going wrong, but a little second thought as well as the sight of others in trouble soon brings with it a realization of the fact that automobile troubles fall on the just and unjust alike. Where to begin is really the question of greatest moment, for there are apparently so many things to learn that it is somewhat difficult to know just which line of investigation to take up as a starter. A pseudo-authority has calculated that there are thirty different things that can go wrong with a gasoline engine, and he took the trouble to tabulate them carefully for future reference, at the same time recommending to all who would learn to pay heed and, beginning at the top of the list, wade through the thirty, if trouble were to be speedily found. After a little experience, the novice will doubtless come to the conclusion that there are more apt to be three hundred things than thirty to go wrong about the engine alone, not to mention sundry other parts of the car, but he will hardly find it necessary to tabulate them nor try to give them a relative order of precedence, though such they have.

Care in Driving the First Requisite.

Starting in with a brand new car just as it comes from the makers, whose testing crews have put it in fine fettle, there is little need to worry about matters going wrong at first. The factor of safety where reliability is concerned, has been brought to a very high point in the modern automobile so that his first care should be to master the operation of the car. Volumes have been written on the subject and doubtless others are in preparation at the moment and they will always continue to come, so that it would seem as if it were hardly possible to say anything new on this matter of pressing importance to the beginner, other than to emphasize the word of caution usually given. With the first full realization of the power at his command, the novice is apt to become keen to use it and show his friends how fast his new car can travel. Changes of speed shade so imperceptibly into one another that before he knows it the car is beyond his control, and herein lies the chief danger. The experienced hand and eye frequently serve to avert disaster when it appears most imminent, where the novice when suddenly confronted with a situation that is the outgrowth of a bit of carelessness in going too fast, finds himself helpless. It would certainly seem an entirely superfluous bit of advice under such circumstances to throw out a caution about trying to make a car take a right angle turn at high speed. There are natural laws that will not be denied, and one of them is that a body traveling in a straight line has a tendency to maintain its direction of travel that is proportionate to

its velocity. The faster the car is going the more will it resent an attempt to suddenly change its direction; the result is invariably that it does continue in that direction, progressing sideways by rolls instead of on its proper base. The frequency with which accidents of this nature occur, shows how little the advice is heeded.

How Not to Leave the Car Is Important.

It is assumed in this case that when the newly-fledged autoist finally takes possession of his car from the agent, the latter has initiated him into all the mysteries of its operation. He knows how to start and stop as well as handle the wheel and the change speed levers whether in traffic or out in the open, so that it is really the little difficulties that are most troublesome. But before taking these up, it is well to dwell on a point that is seldom, if ever, brought out in any of the lengthy dissertations so full of valuable advice that are constantly appearing, and that is, *how not to leave the car*. To one who has watched new hands in the course of being broken in at the steering wheel, the first thing to strike the attention is the fact that nine out of almost every ten will go through the same procedure in bringing the car to a stop and leaving it, and that is in failing to return the change speed lever to the neutral point. The emergency brake will invariably be applied with great care and firmness, but the change speed lever will almost as many times be left in whatever notch it happened to be when the car stopped.

Novices are not the only ones who do this, as witness the occasional accident that results from it. That the latter are not more numerous is probably due to the fact that emergency brakes as well as their interconnections with the clutch mechanism, are usually well built and seldom fail to perform their functions. In other words, it is not the care of the driver so much as the reliability of the mechanism that serves to keep down the number of accidents. This, then, is one of the things that every beginner should impress upon his mind most forcibly when learning to handle a car, and that is, never to leave it in such condition that it can by any possibility start ahead should the emergency brake accidentally be released while the motor is running. The latter should invariably be stopped when the car is left standing, the change speed lever should always be brought back to the neutral point whether the car is to be left or not. Apart from the necessity of doing this to avert accident, going into the first speed to start is always requisite so that a shift would be necessary at all events.

Little Troubles That Are Perplexing.

It has been figured out as the result of a lengthy investigation into the subject that between them the carburetion and the ignition are responsible for 80 to 90 per cent. of all the troubles that afflict the automobile, and this will be borne out by the personal experience of the average autoist who runs his own car and doctors it when necessary. Doubtless the ignition can be accorded the first place as the inquiry referred to showed that it was accountable for fully 50 per cent. of all the involuntary stops while the matter of fuel supply provided 30 to 40 per cent., only a mere matter of 10 per cent. of all the troubles encountered being traceable to purely mechanical defections. This being the case, these essentials should be the first to come in for attention.

Take the ignition as a starter. Of course volumes can be written on it and still leave something unsaid, but in many cases the beginner is but little wiser after having waded through them. It is to be presumed that the newcomer knows the rudiments and further knows how to apply them. Next to these comes a knowledge of the system's weak points, and it is surprising how long it takes some new hands at the wheel to put two and two together when an ignition fault is in question. There seems to be little

doubt that the timer of the coil and accumulator system of ignition is the most prolific source of trouble, though this is something that it is hard to make the novice believe and something that it takes him a goodly time to realize for himself. To the average beginner there are only two things to go wrong about the ignition system and they are the spark plugs and the battery. Like the little girl who wore her tooth brush out on her two front teeth without touching the others, the beginner spends his time cleaning the spark plugs and testing the battery, probably running it down as much, if not more, in this way than in actual service. Of course, the timer is not always at fault, by any means—if there were any one thing about the ignition system that always could be relied upon as the sole source of trouble, matters would be greatly simplified. But it is responsible for a puzzling refusal of the motor to start in far more cases than it is suspected, particularly by the autoists whose experience in trouble-hunting has been limited. And by the same token, more spark plugs get an unnecessary cleaning than even the most finicky of old maids would give a prized piece of china. Plugs do soot and batteries run down—that goes without saying, but they are not things of one idea by any means. Take the average ignition in the best of condition and its timer will nearly always be found to constitute its weakest link.

There are other things beside, such as the ubiquitous short-circuit, the sticking trembler, the poor ground connection or a chafed secondary lead, but these and a great many others that might be mentioned, were it profitable to do so, are of rather rare occurrence on the modern car that is at all well taken care of. It is an axiom that moving parts wear quickly, and rubbing parts most quickly, so that attention to those parts subjected to the greatest wear, whether mechanical or electrical, is usually time well spent when looking for trouble.

Some Common Fuel Supply Troubles.

It would seem that the empty gasoline tank joke which so often was found to constitute the sole moving cause of what the fledgling took to be serious trouble indeed in the early days, should be catalogued as belonging to a prehistoric age in things automobile. That such a thing can happen to-day hardly seems possible, but the fact remains, as note the general demand for a reserve supply of fuel that cannot be used inadvertently by the driver. And the empty tank or its equivalent, which means lack of fuel, is at the root of not a few engine troubles that are traceable to this essential. Next to no gasoline, too much of it is the cause of much profanity. In fact, it is a far more common ailment than its opposite and all unknowing, the average green hand aggravates the trouble in nine cases out of ten. Failure to produce the welcome chug that means the motor is ready to assume its duties, calls for another whack at the carbureter and a return to the crank, the operations being repeated alternately.

I have often thought that a medal ought to be awarded to some of the well-known carbureter makers by virtue of the amount of abuse their devices will stand and still perform their duty. The way some drivers *tickle* the carbureter would cause an elephant's hide to itch; in fact, not a few seem to regard the little lever that touches the float as a sort of pump which requires vigorous battering to draw fuel up through the spray nozzle. Pressing it down as gently as if it were frail glass and holding it down momentarily will naturally accomplish the same object with far less risk of throwing the float out of adjustment.

There can be no denying the fact that there are some phases of the carbureter problem that are more than sufficient to puzzle the most experienced, so it is little to be wondered at that its vagaries should make it respected as a mystery by the less initiated, and because a thorough understanding of it is more or less rare it is looked upon as a proper subject for investigation by the amateur every time that there is anything inexplicably wrong with the motor. Which means, of course, whenever the motor refuses to start and frequent recourse to the crank fails to produce any encouragement. May be it is on the principle that some people

are always ready to torment anything that cannot kick back, that so many carbureter adjustments are gone through every time there is trouble of this sort. Certain it is that this part of the motor is tampered with all too frequently on little or no provocation until it gets out of order for good, principally because it has been bungled with so much. This and hammering on the carbureter pin to tickle it are quite common practices, as any autoist who keeps his eyes open may see for himself. Nor does the average beginner appreciate the fact that too much gasoline is almost as bad as none at all when it comes to starting the motor—a state of affairs for which overmuch persuasion of the carbureter to induce the fuel supply's arrival at it is most often responsible. It should be remembered that turning the motor over by hand induces but a comparatively small amount of suction through the air inlet and that in consequence almost pure gasoline vapor is drawn in. Anyone who has tried knows it is not an easy matter to fire this. If it were not for the fact that such a condition usually cures itself in the interval between tinkering by the evaporation of the gasoline and the formation of an explosive mixture, the average autoist would doubtless find his motor much harder to start than it is. An extra quick turn over compression is far more effective in creating the mixture requisite for the initial explosion than flooding the carbureter and when an encore or two at the crank fails of the desired result, momentary depression of the float will save both time and gasoline.

There is nothing startlingly novel about the foregoing suggestions, and the new hand who applies himself to the study of his car soon learns them for himself, not to mention a number of others equally valuable to him in the maintenance of his machine, but disregard of them on the part of the novice is very general in his early days and the fact that they are accountable for an amount of annoyance totally disproportionate to their apparent importance is seldom suspected. They are the little worries of automobiling and, like the little troubles of everyday life, they take on an appearance of great magnitude and importance at the moment. They stop the wheels of progress for the time being and when the ailment does not respond instantaneously to the first treatment that suggests itself to the self-constituted physician, he is prone to lay the blame on the machine instead of on his own lack of skill and patience in doing the doctoring.

IN CASE THE PRESSURE FEED BREAKS DOWN.

One of the disadvantages of a pressure feed gasoline tank under the chassis is the danger of it being pierced by a collision or by a flying stone thrown up by the wheels of the vehicle itself. There are a number of preventatives in general use. Some firms place a stout steel bar across the frame to the rear of the tank, thus preventing it being hit by any vehicle in the rear; a number of laths held together by a strap are sometimes employed, and a large sheet of matting is not infrequently seen. This latter is not to be recommended. It is easy to spill gasoline, which is of course sucked up by the mat, and should a light reach it a short time after a serious flare-up would result. Some European chauffeurs surround their tank by a sheet of fine wire gauze, which effectively keeps off road projections and does not retain gasoline. If a transverse metal bar is used in conjunction with this all danger of the tank being pierced is removed.

Should the pressure feed system break down, either owing to the tank being pierced or owing to one of the air pipes breaking, a temporary remedy can be obtained as follows: Disconnect the main feed pipe to the carbureter and replace it by a rubber tube about a yard long leading from the carbureter to the driver's seat. If necessary a hole could be bored in the footboard; care should of course be taken to keep the tube away from the moving parts. A curved piece of metal piping is attached to the end of the rubber tube, and the long end put into a tin of gasoline. The can may be attached to the dashboard, and as reliable a flow of gasoline is obtained as if the regular fuel-feeding equipment were still continuing to perform its task as usual.

LETTERS INTERESTING AND INSTRUCTIVE

Information Wanted on Buggyabouts for So. Africa.

Editor THE AUTOMOBILE:

[788].—As a subscriber and interested reader of your journal, will you kindly tell me which of the vehicles called "buggyabouts" you consider the most practical and reliable machine, irrespective of cost. I am desirous of introducing them into this country, where our roads are not good and many small streams have to be crossed, and where high wheels are a necessity. Do you think the means taken of keeping the cylinders cool sufficient? It is pretty hot here in the summer, about 80 degrees in the shade. I should be glad to hear of the experience of anyone who has tried one. I am alluding to such vehicles as the Holsman, Dayton, and others. G. C. WILLIAMS.

Maritzburg, Natal, South Africa.

Like the "best car" question, on which you have doubtless noted our remarks in a recent issue under this heading, this is a rather difficult question to answer. It is narrowed down to a certain class, it is true, and naturally there is always a *best* in every class, as we ourselves have been at pains to point out, though this does not materially lighten the task of making a proper reply to your query. There are at present a dozen or more of this type of vehicle being turned out to a greater or less extent in this country, and no two are exactly alike, so that the adherent of any particular system, such as two-cycle air-cooled, four-cycle air or water cooled, planetary transmission, chain, friction or rope-drive can find something to suit his fancy. There are many days in summer here when the temperature exceeds the figure you mention, and little or no difficulty is experienced in efficiently cooling such motors as these cars are equipped with. They are designed for strenuous work, such as would naturally be called for in traversing the South African country, and can make good speed on the level. The number of parts is few and they are made as simple as possible, so that we should think that by ordering a number of the parts most likely to go wrong, thus having them ready for replacement at any time, considerable hard service could be obtained from such a car.

However, this does not bring us any nearer to the main point of your question, as to which is the best car of this type. To be frank, we really do not know, for, never having had an opportunity to test them out on the road, we have had no occasion to note their performance in use. We very much fear you will have to decide the matter for yourself, as in every other question of a similar nature; but the publication of your letter will doubtless come to the notice of a number of the makers, who will facilitate matters by presenting their respective claims for preference in the way of advertising literature. If any of our subscribers have had any personal experience with machines of this type we should like to hear from them fully.

An Inquiry Regarding a Separable Differential.

Editor THE AUTOMOBILE:

[789].—Being a subscriber to "The Automobile," I would like to ask you regarding a form of differential that is applied to each wheel, instead of at the center of the rear axle or on the countershaft, as is ordinarily the case. Any information you can give me will be appreciated. W. J. SEITZ.
Monroe, Mich.

The only invention of this class that we can recall was termed the Hedgeland anti-skid axle—that is, the only one that reached the market on any scale in a commercial form. We do not remember exactly the details of its mechanism, but the principle was that of the free wheel used on bicycles, the power being applied on rounding curves to the slower moving of the two wheels, the inner, while the outer was allowed to run free owing to its higher rate of travel. So far as we know at present, this device is no longer on the market and we have no knowledge of any other of this type.

Points of Interest About Magneto Ignition.

Editor THE AUTOMOBILE:

[790].—I have a four-cylinder car of the regulation type which is equipped with two independent ignition systems, one having a set of four unit vibrator coils, timer and accumulators, and the other a self-contained system consisting of a high-tension magneto, on which practically nine-tenths of the running is done. I do most of the work about the car myself, and have become familiar with it. What I would like to have some light shed upon is the radically different action of the magneto ignition as compared with the battery and coil side.

1. That is, why is it possible to advance the spark so very much more in using the magneto to start on without having the engine kick back, as would be the case were the battery current used under the same conditions? In fact, it is necessary to advance the spark control lever quite a distance in order to make it possible to start on the magneto.

2. How do you account for the fact that once under way it is not necessary to shift the magneto ignition except very rarely, also that shifting the lever back and forth a number of notches makes but little perceptible difference in the running of the engine. In other words, it is necessary to shift the lever considerably more to slow the engine down by retarding the spark when running with the magneto than with the battery, and it is seldom if ever necessary to advance it, the engine doing its best at a fixed point with this system.

A little light on these questions would be greatly appreciated by the writer, and probably by a number of others who have observed the same things in the handling of their cars. B. H.

Babylon, New York.

1. To take up the latter part of your question first, a little study of the working of a magneto will readily make clear the reason for advancing the spark much further in order to start the motor. As the armature of the generator is bi-polar, it generates but two impulses per revolution; between these there are neutral or dead points, at which no current is passing. The current wave produced is in the form of a peak, considering the neutral points as being on a horizontal line, as explained some weeks ago in THE AUTOMOBILE. From this line the current wave rises sharply while the poles of the armature are passing the edges of the pole pieces of the field, or cutting the lines of force of the magnetic field, as it is termed technically. The wave reaches its maximum when the center of the pole of the armature corresponds with the diagonally opposite edges of the field pole faces, when it begins to drop as rapidly, crossing the horizontal line and repeating the same operation beneath it. The meeting of each pair of these lines forms a triangle, with the horizontal line as a base; the apices of these triangles are the peaks of the current wave, and only a certain percentage of the latter is available for ignition purposes. This was graphically shown by the illustrations published in connection with the article already referred to. At the top of the peak the current reaches a maximum value; the object is to utilize it as near the latter as possible. Taking 15 per cent. of each side of the peak as the amount available, the duration of the generation of this portion of the current, measured on the arc of a circle representing the revolution of the armature, gives the number of degrees that it is possible to advance or retard the occurrence of the spark. In equipping a car with a magneto the latter is timed so that the greatest amount of running can be done when the generator is giving its maximum spark. But when turning the engine over by hand the generator is at a considerable disadvantage, owing to the extremely low speed at which it is revolved. It cannot produce more than a small fraction of its rated current output and it is not as quick to act, which explains both the reason for the necessity of giving the lever considerably more advance than with the battery, as well as the possibility of doing this without fear of the motor kicking back. In other words, the location of the spark advance lever has considerable influence on the character of the spark produced in the case of the magneto, which is naturally not the case with a battery and coil system, as the latter depends upon a constant source of cur-

rent, the only variation of which lies in its exhaustion or gradual approach thereto when the spark becomes weaker, and considerably more advance is necessary. Apart from this and the fact that improperly adjusted vibrators or other sources of current wastage tend to run the battery down, it is not at all influenced by the same considerations as those mentioned with regard to the magneto. The fact that it is possible to safely start the car with the ignition advanced as well as the fact that it does not require constant shifting are both advantages in its favor.

2. Much of the information requested by your second question has been covered in answer to the first. As already explained, the peak of the current wave represents the maximum current value and, accordingly, the best possible running point for the engine; no amount of shifting one way or the other can improve it. Another very important reason is the fact that the magneto acts *instantaneously*. There is a popular belief that this is true of the electric current under all circumstances, but such is far from being the case. There is quite a perceptible interval between the time the battery current is sent into the primary winding of the induction coil and the moment the spark is produced in the cylinder. This arises from several causes, such as the fact that the core of the coil must be magnetically saturated before it acts, the inertia of the vibrator must be overcome, and the like. The magneto armature is also wound to generate the current at a very much higher potential or voltage than is possible with a battery. The fact that shifting the spark advance lever back and forth on the sector makes little perceptible difference in the running of the motor is due to the excellent current wave produced by your magneto; its value is the same for some distance either side of the peak, which also accounts for the greater distance it is necessary to move it before a retarding action takes place, or before a point is reached where a much weaker part of the current wave produced is being utilized.

Varied Queries About Christie's Grand Prix Racer.

Editor THE AUTOMOBILE:

[791.]—Kindly answer in "The Automobile" these questions: Has the Christie Grand Prix car any front springs? How is it possible that the steering wheels are fully responsive to the steering wheel and still transmit the motive power? How is the connecting rod attached to the front axle? Why is not the two-cycle engine more popular if it gives more even torque than a four-cycle engine? In an emergency how can a car be run without the pump? Which shaft travels the faster, the cam or crank, and how much faster? Bayside, New York.

VINCENT BOELKE.

Walter Christie's Grand Prix racer has coil springs and heavy rubber buffers as front suspension. The front road wheels respond readily to the steering wheel owing to the interposition of a universal joint between each end of the driving shaft and the road wheels. Christie's machine has no front axle; the connecting rod is behind the circular steel crankcase, set across the fore end of the frame and united to the steering arm in the usual way. Steering control, however, is by rack and pinion. Full particulars of the machine will be found in the April 11 issue of THE AUTOMOBILE. Although possessing distinct theoretical advantages, the two-cycle engine, as at present constructed, has certain grave defects. It is not so economical of fuel; it has not the suppleness of a four-cycle engine, and is consequently less suitable for automobile work; there is always a danger of premature ignition if the engine does not clean out the burnt charge sufficiently. On some engines the pump could be disconnected and thermo-siphon water circulation employed temporarily. Owing to the smaller volume of water and the smaller section of the tubes, however, it would only be a makeshift remedy at best, and on many engines would altogether fail to produce a flow of water. The crankshaft travels the faster; ratio on a four-cycle engine is 2 to 1.

TESTING OUT MOTORS AT THE POPE PLANT.

Editor THE AUTOMOBILE:

[792.]—At the present time anything connected with an automobile is a subject of absorbing interest to the average man, and

a visit to an automobile factory which is producing cars in large quantities is a delightful revelation.

Few men who purchase a car fill up the gasoline tank and the oilers and then start off for a tour have any comprehension of the patient care and skill which follows every operation of construction and assemblage from the first conception until the machine is finally handed over to the customer. No matter how carefully or accurately an automobile may be made it cannot do good service and live up to the high standard required by its conscientious maker unless each one of its many parts is properly adjusted so as to work in harmony with all correlating parts.

In order that the manufacturer may be absolutely certain that machines leave his hands in proper condition for immediate use it is necessary to employ a corps of skilled and experienced mechanics, not only for the purpose of testing and trying out each part as it is assembled, but finally to prove up the whole car as a unit.

A brief sketch of the methods employed will undoubtedly be of great interest. Take, for instance, a four-cylinder gasoline engine; while it is comparatively simple in construction it is composed of many parts, and it is absolutely necessary that each one of these parts be made with accuracy and without variation from the accepted standard. The parts are so carefully designed that in a first-class automobile factory the engine when put together in the assembling room goes together without the use of elaborate tools other than the wrenches necessary for fastening and bolting the various parts into place.

In the great Pope plant at Hartford there is one special department devoted exclusively to the testing of engines, and it is a very fascinating sight for the visitor to go into this room and see engine after engine in a long row, fastened each to its own stand and working away smoothly and quietly without seeming effort. When the engine is delivered to the testing room it is securely bolted to an iron stand and is then connected by a belt to the main line shafting and driven for hours by outside power, being fed with oil and other lubricants and continually supplied with water through its circulating system. This work is continued until all the adjustments are accurately made and the engine runs freely and smoothly, without heating, or, in other words, it "finds itself."

When it has passed this test it is then connected with a fuel tank and with its ignition system, and then started and run under its own power in the same manner as it would be in the hands of an owner. This test always takes a number of hours, and the exact and rigid requirements of the Pope factories demand that it shall stand it without a murmur, running with quietness and smoothness and without heating in any of its essential parts. If the engine fails to pass this test it is sent back to the assembler, who takes it to pieces, locates the trouble, and replaces with new parts those which are not running satisfactorily.

Any engine which passes this crucial test is in shape to be assembled into a complete chassis and put through the test of actual use on the road as a part of a complete car. After the automobile is put together and passed by the various inspectors it is turned over to the final testing department, which is composed of men who by their long experience and special training are fitted to adjust and tune up the car to "concert pitch." A set of old tires is put on the wheels and a special testing body is fitted to the chassis and the car is then sent out for practical road adjustment in the hands of an expert.

In the vicinity of Hartford, where the main Pope plant is located, it is an everyday sight to see these cars running in numbers with their rough bodies and mud bespattered wheels over hills and country roads for miles around. It is the testing all along the line which insures a product satisfactory not only to the makers, but to the users. It is practically impossible for a car to pass through all these tests and trials without there being detected any slight lack of adjustment or flaw in the entire construction. When so proved up the car is turned over to the shipping department and the makers feel sure that it will go into the hands of the consumer in perfect condition.

CHARLES E. WALKER,
Vice-President, Pope Mfg. Co.

Hartford, Conn.

MAYBE THERE IS WATER IN THE CYLINDER.

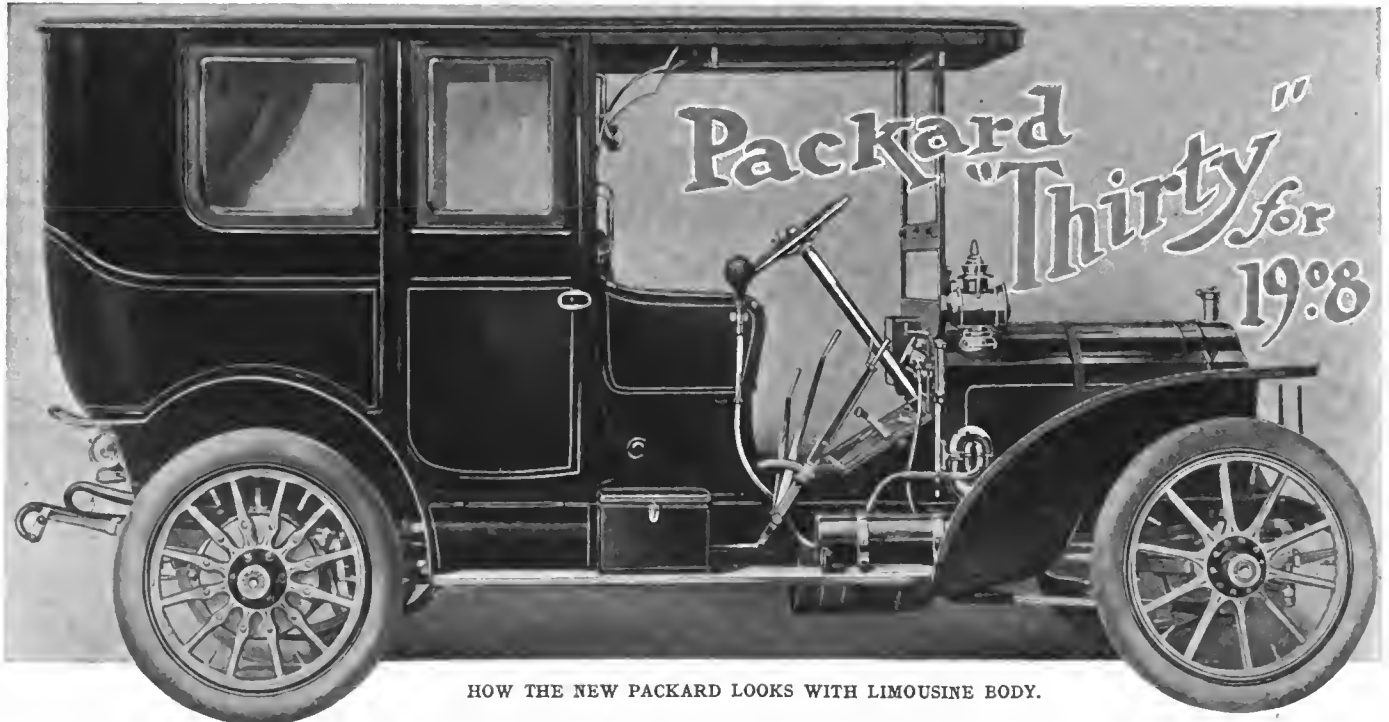
Editor THE AUTOMOBILE:

[793.]—Answer to No. 767. Take off cylinder head and see if water is not leaking into cylinder. This would cause engine to be very hard to start, as a small quantity, say a tablespoonful, of water in cylinder makes it almost impossible to start. Take the gasket off and you can tell from that, as it will look black where the water leaked through. I had a car come to my garage that was in just this fix—everything seemed all right except that it was very hard to start after it had stood idle.

I hope this will help No. 767. I should like to hear from him as to whether this is the trouble.

Corisicana, Texas.

CLARENCE THOMAS (Auto Doctor).



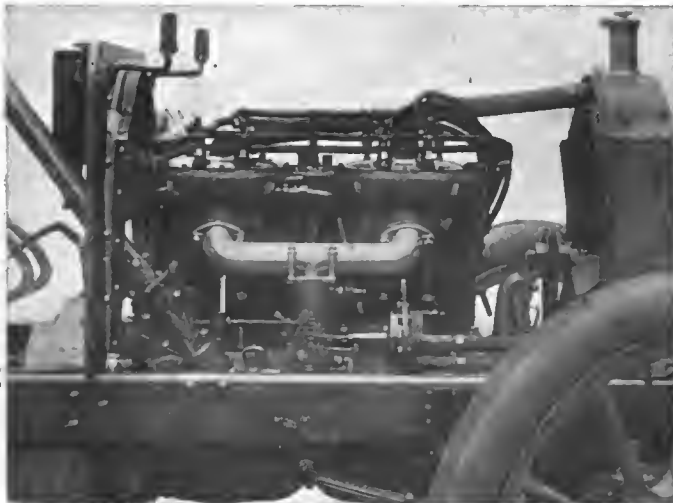
HOW THE NEW PACKARD LOOKS WITH LIMOUSINE BODY.

IN line with its well-established policy of devoting its entire attention to the production of a single model each season, which it has now consistently adhered to for several seasons, the Packard Motor Car Company, Detroit, will pin its faith for the season of 1908 to the Packard "Thirty," which is essentially a continuation of its predecessor of the present generation, barring development in the shape of detailed refinement that has been suggested by experience and observation during the past year. All those basic features of construction and design that have fulfilled the object of their creator by giving satisfactory service on hundreds of cars in daily use all over the country, have been retained intact, forming the groundwork upon which the designer has built up a system that may appropriately be termed "thoroughly Packard" throughout, so long have its principal elements been identified with this car.

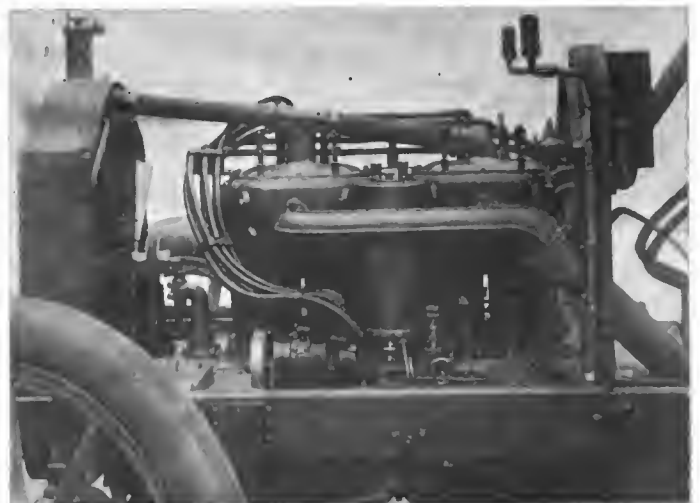
Among the chief changes that will serve to distinguish the new car to the experienced eye will be its slightly increased wheel-base and the employment of 36-inch wheels, though the most distinctive marker that will enable the automobile-wise to immediately pick the 1908 model out of a crowd, as it were, consists of the altered design of the radiator cap or filler opening. Realizing the inconvenience of the screw-thread method of fastening such a part, a bayonet form of lock has been adopted for it, and

the same is true of the fuel and lubricating oil-tank caps, thus rendering their removal the work of but a moment.

The rating of the four-cylinder water-cooled motor, from which the car takes its name, is 30-horsepower at the extremely moderate speed of 650 r.p.m., but its dimensions of 5-inch bore by 5½-inch stroke make it apparent that this is merely nominal and that its actual output is far greater. In fact, it is rated according to the French "system," and as the French autoist has to pay an annual tax based upon the horsepower of his car, it is easy to see why horsepower ratings are kept low regardless of motor dimensions, in view of which it is not surprising to learn that the Packard motors have turned up to practically double their nominal rating on the brake. Their French rating grows out of the fact that the cylinder castings, as well as the pistons, piston rings, blank and exhaust manifold castings, are imported from France in the rough, being cast from a gray iron mixture specially adapted for the construction of such parts. The cylinder castings are of the twin type, with oppositely disposed valves of the outboard type, actuated by separate camshafts enclosed in the crankcase. High-carbon open-hearth steel, that is received in the shape of hammer-forged billets, constitutes the material from which the crankshafts are cut. The shafts are oil-tempered, bearing surfaces ground, and the entire shaft machine-



INTAKE SIDE OF PACKARD MOTOR, SHOWING CARBURETER, ETC.



EXHAUST SIDE, SHOWING OIL PUMP, MAGNETO AND TIMER.

finished. The connecting rods are drop-forgings, and both the crankpin bearings and the main bearings are of special Parsons white bronze, the piston pins being carried in hard bronze bearings. Grinding is employed wherever possible to obtain extreme accuracy, such as in the finishing of the inside of the cylinders, the pistons, piston rings and the like, all three being "lapped" with a suitable polishing agent in addition, giving these parts the highly finished surface that is so essential to an absolutely smooth working fit.

The crankcase is cast of a special aluminum alloy in three horizontal sections, the camshaft gears, as well as those of the magneto and the pump, being contained in a separate but integrally cast oil-tight extension of the crankcase. The uppermost section of the latter forms a base for the engine and is supported directly on the side members of the frame. Between the lugs

or transverse supporting arms is cast an integral web entirely enclosing the space between the motor and the frame from beneath, thus affording complete protection to the engine as well as its accessories, and particularly the magneto.

The Packard motor is distinguished from the majority of American motors by other departures from what may best be termed standard practice, owing to the number of instances in which it is followed. Chief among



DIFFERENTIAL AND CHANGE SPEED GEAR.

these is the retention of a governor, of a special hydraulic type, originated by this house and long a feature of its cars, while the other is the use of a water-jacketed carbureter. The latter is of special design and construction throughout. It is of the standard aspirating-nozzle, float-feed type, with an automatic auxiliary air-inlet, and is fitted with a butterfly throttle. The auxiliary air-inlet is of the poppet-valve type, and is controlled by a small helical spring, the tension of the latter being readily adjustable to suit changing atmospheric conditions by means of a sliding wedge actuated from the driver's seat by a small lever on the dashboard. The fuel supply is taken by gravity from a tank under the forward seat, and having a capacity of twenty-one gallons, while the water-jacket circulation is a part of the cooling system of the car. This is also true of the hydraulic governor, which acts on the butterfly throttle. The cooling system consists of a fin tubular radiator supplied by a gear pump and supplemented by a belt-driven fan mounted on annular ball-bearings. But six gallons of water are necessary.

Both the ignition and lubrication systems are of considerable interest, and particularly the latter as being representative of as close an approach to ideal simplicity as can be found in this very important essential of the car. More than that, it has the great advantage of being practically self-contained, thus

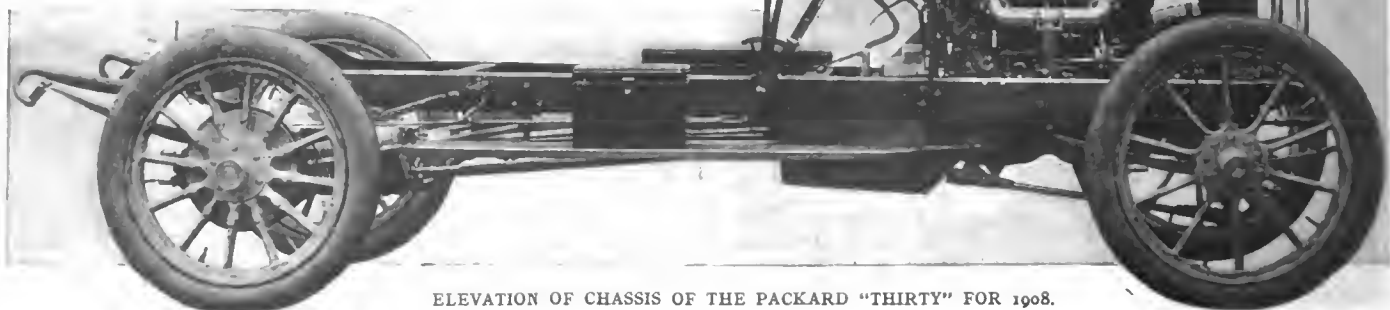


SEVERE SIMPLICITY OF THE PACKARD DASHBOARD.

requiring but a minimum of attention for its proper maintenance. It consists of a cylindrical copper tank placed upright between the cylinder units, this location insuring a supply of oil at the proper consistency at all times, despite weather conditions. A double-plunger pump, actuated by a worm on the exhaust camshaft, connects with this tank of oil. There is a transverse central partition in the oil pan of the crankcase to preserve the oil level in climbing or descending grades, and each of these compartments is fed separately by the oil pump. Before passing to the crankcase the oil goes through two sight-feeds on the dash.

High-tension ignition is employed, an Eisemann magneto being used in regular service, while an imported Fulmen set of accumulators is used as a reserve and for starting from the seat. The magneto proper is of the low-tension type, employing a single non-vibrator coil to transform the current, distributing it through the synchronous mechanism on the generator. On the accumulator side a single vibrating coil is used, both these units being placed in a case on the dash, while the timer is mounted on a vertical shaft at the rear of the motor. There is but one set of secondary connections and one set of spark plugs, the distributor of the magneto being employed in the same capacity when the car is being run on the battery, thus greatly simplifying not alone wiring, but also reducing the amount of apparatus needed.

With the exception of the use of a newly designed universal joint of the yoke type, fitted at the clutch end of the propeller shaft, the various steps in the transmission of the power are the same as in former models. The Packard screw-and-nut-actuated internal expanding clutch is retained, as is also the same type of rear-axle unit construction that has long been a distinguishing feature of this car. This is shown complete in one of the accompanying illustrations. The same housing covers gear-set, final drive and differential, and a new design, in which the interior of the casting is ribbed and its outside face smooth, has been adopted.



ELEVATION OF CHASSIS OF THE PACKARD "THIRTY" FOR 1908.



IN addition to being one of the first of the six-cylinder models for 1908, of which full details are forthcoming, the Great Chadwick Six represents an example of automobile construction embodying numerous features that are both out of the ordinary and of interest from a technical as well as a popular point of view. Its title is an apt one, the significance of which is only appreciated upon reviewing the specifications of the car itself, as the latter is one of the largest of its kind ever regularly catalogued either in this country or abroad. Large cars are not uncommon any more than are those of the six-cylinder type, but a six-cylinder car of this size is certainly a rarity, as will be at once apparent when it is stated that the cylinder dimensions are 5 inches bore by 6 inches stroke, while the motor is geared considerably higher than is customary with anything but specially designed racing cars, the motor making but 19-20 turns for every one of the driving wheels. Despite the unusual size of its cylinders, as well as the fact that its compression is reasonably high—in fact, investigation shows that the latter essential is not far from the average, reaching as it does, 70 pounds to the square inch absolute—the motor of the Great Chadwick Six is rated very low, merely being credited with 70 to 75 horsepower. A few years ago such an engine would have been rated at double this, and no doubt it shows a substantial excess over its rating on the brake, particularly as its normal speed is 1,100 r. p. m., which gives the car itself a speed considerably better than a mile a minute without urging the motor in the least.

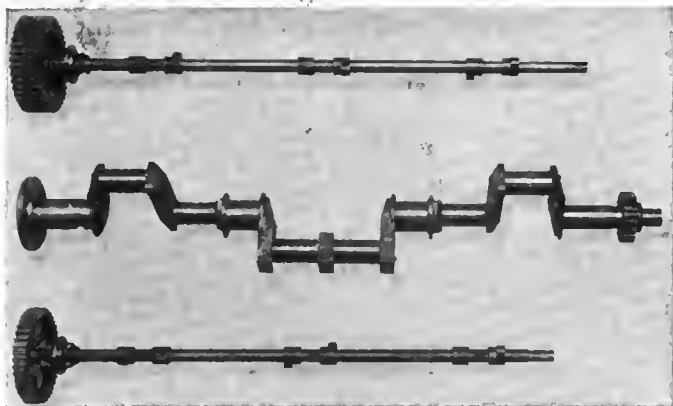
More than that, the excess of power is such that probably the motor will never be called upon to develop more than 50 per cent. of its rated capacity under anything except extraordinarily bad conditions.

Motor Design.—It will be evident at first glance to those who are familiar with previous Chadwick productions that the same ideas and features of construction that have always characterized the work of this designer have been perpetuated here. The first of these to attract attention is the peculiar cylindrical copper water jackets completely surrounding each of the dual cylinder units as well as their valves. It would seem that this arrangement necessitated the use of a comparatively large quantity of cooling water, but quite the reverse is the case, as only six gallons of water in all are required for this large motor. The idea of the design has been to attain uniform cooling and to achieve this result a much larger mass of water is concentrated around the hottest parts of the cylinder than is usually the case in the great majority of standard American cars. The upper

ends of the valve chambers project through the top of the jacket and are threaded to take spanner nuts which, when set up in place, serve to hold the jacket down against its seat cast on the cylinder. This integral flange fits the inside of the jacket and the latter is retained in place by driving a special steel ring down over the outside; the flange on the cylinder has a liberal face and is given a slight taper, thus facilitating the making of a water-tight joint at this point. The system also dif-



INLET SIDE OF MOTOR OF THE GREAT CHADWICK SIX.



DETAILS OF THE FOUR-BEARING CRANKSHAFT AND THE CAMSHAFTS.

fers from others in that two supply openings are provided, that entering the exhaust side being larger than its opposite near the inlet, both coming up from below. As shown by the illustration of the carbureter side of the motor the water leaves the jackets at their centers through nipples connected with the return pipe to the radiator. A rotary pump driven by a jaw clutch from the end of the magneto shaft, and a belt-driven fan complete the cooling system. The valves are oppositely disposed and are actuated by separate camshafts with integral cams as shown by the illustration, which also depicts the four-bearing crankshaft. Laminated fiber and bronze and steel pinions, completely encased, are employed and make for silent running.

Carburetion and Ignition.—Probably the most distinctive feature of the carbureter is the manner of its control. The throttle lever is connected with a system of linkage by means of which both the amount of mixture permitted to enter the cylinders is not only varied, but likewise the amount of gasoline that enters into the composition of that mixture, and as this is adjustable so as to cause the throttle to open faster or slower than the fuel admission valve opens, an extremely wide range of carbureter effects is easily obtainable. Fuel is admitted at the side of the lower portion of the body of the carbureter which is surmounted by the float of annular form. The spray nozzle is located in the center of the open part of the float and is surrounded by the main air-passage, the auxiliary supply being regulated by the diaphragm shown and entering through a valve at the left, controlled by a small helical spring. A small hole in the center of the top of the diaphragm case admits atmospheric pressure to this side of the diaphragm, its vertical movement being regulated by the speed of the motor and the consequent depression set up on its under side.

The ignition is duplicated throughout, a rather unusual thing being found in the employment of a set of dry cells as the source of starting current, the running all being done on the magneto end of the system which consists of a LaCoste high-tension magneto forming a self-contained unit on one side and a Bosch magneto of the same type on the other. Each magneto is wired to a separate set of spark plugs, the former system also being inter-

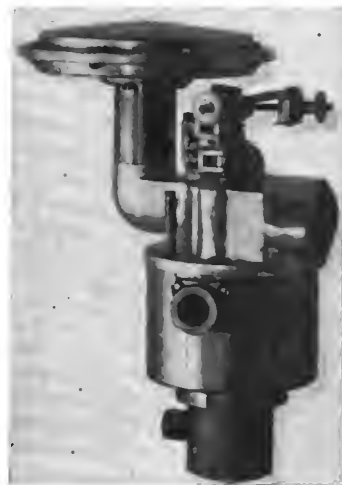


SHOWING THE COMBINED DISTANCE ROD AND CHAIN CASE IN PLACE.

connected with a Herz timer and La Coste coil, and using the set of dry cells to start on, so that in reality the car actually has three systems of ignition, two of which are wholly independent, while the third may be used separately in case of emergency, particularly as it is used with a third set of plugs. All the wiring is enclosed in copper tubes.

Transmission System.—This essential of the car is distinguished by the use of a change speed gear set of original design in that the countershaft carries a large double-faced bevel to each side of which the main and lay shafts of the gear-set are respectively engaged. The double bevel is fixed to the differential sleeve. Four speeds forward are provided, but the design is such that the set is unusually compact, only one pair of spur gears being used for each of the three speeds below the high, while the latter is direct. With the exception of the intermediate reversing pinion, which, on account of the slight measure of service demanded of it, is mounted on a bronze bearing situated below the oil-level of the case, the main and lay shafts as well as the countershaft carrying the differential are carried on D. W. F. ball bearings. Both the bevel and the spur pinions are of chrome nickel steel.

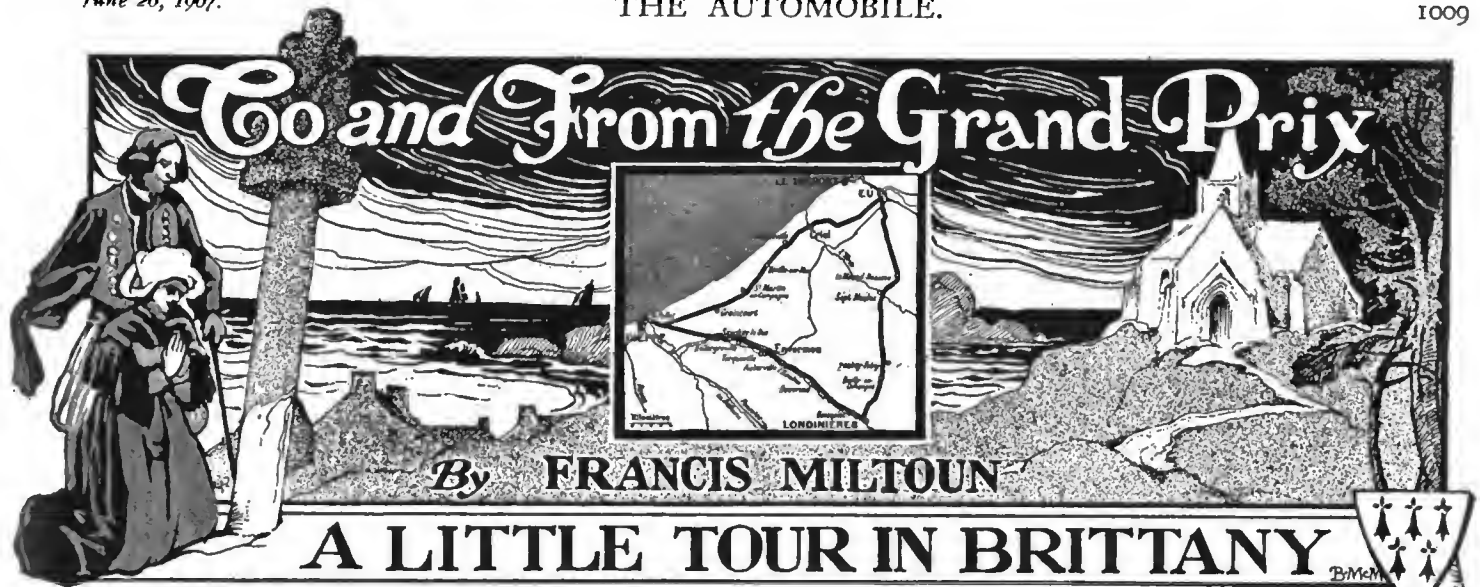
The clutch is of the standard conical type, the male member of which is faced with sheet phosphor bronze, riveted on and turned true in place, the female member being formed in the fly-wheel itself. Through this phosphor bronze facing are placed 60 cork inserts 3-4 inch in diameter, the latter being hand-finished in place and projecting very slightly above the metal. The clutch is of a somewhat large diameter—17 1-2 inches—but is very light, which is also true of its single actuating spring. Final drive is by double side chains and the chief feature of this essential of the car is the employment of a very ingenious form of chain case, some idea of which may be gained from the illustration showing it in place. This chain case is combined with the distance rod separating the rear axle and the countershaft, and its construction embodies many novel features. The distance rods are banjo-shaped castings of manganese bronze, the rear axle passing through



THE NEW CHADWICK CARBURETER

the center of the large end, permitting them to swivel about while the forward end accommodating the countershaft is in the shape of a slot to permit adjustment of the latter, this being accomplished by means of a set screw and pinching lock screw which draws the split-end of the bronze casting together. These distance rods also carry the two halves of the aluminum chain case, no provision for telescopic action being necessary in the latter, as the forward part of the case does not move with the chain-adjusting travel. Though very light, the construction is very substantial and is moreover very simple, which permits of its ready removal and replacement when necessary, at the same time providing that thorough protection which adds so much to the efficiency of the chain drive.

Chassis Details.—A channel section frame of chrome nickel steel forms the foundation of the chassis, the motor base lugs being bolted directly to the main frame, while the gear case is suspended between two of the central braces of the main frame, no subframe being employed. The front axle is a one-piece chrome nickel forging with a 4-inch drop, and the rear axle is of similar material and construction. The suspension consists of two 40 by 2 inch semi-elliptic springs forward and platform system in the rear. The wheels, all of which run on two sets of D. W. F. ball bearings, measure 36 by 5 inches and are shod with Continental tires.



A ROUND Brittany, in connection with the tour of Normandy, will require an additional five or seven days, and the two, combined with Touraine, say three weeks, allowing at least a nodding acquaintance with the charms of these three fairest and most picturesque provinces of France.

If Normandy or Touraine be considered separately, and one comes out direct from Paris, there are 250 kilometers of the Route de Bretagne before Mayenne is reached via Alençon, or 300 to Laval via Chartres and Le Mans. It is a superb itinerary by either route, but if one is bound for St. Malo and the Côte d'Emeraud, or Concarneau and its *plages*, there is still the matter of another 300 kilometers to roll off before one arrives at their objective, and one will have no time to linger en route, save to make such passing observations as fancy suggests.

From Paris, then, the best route is out via Versailles, Chartres, Nogent-le-Rotrou and Le Mans, through the very heart of one of the finest agricultural regions in all France, with Routes Nationales all the way, great tree-bordered, sandy-surfaced roads without flints, hidden level-crossings or bad curves, save here and there where one passes through some little old-world village with a cobble-paved main street. It is in these crowded little French towns that most automobile accidents happen; but the local authorities generally cut your *vitesse* down to 12, 10 or 6 kilometers an hour and put up great starting signs reading "*Ralentir*" or "*Virage Difficile*," so it's your own fault if anything happens. What you want to look out for before and after coming to a town are the *culverts* and *canivoux* crossing the road; many a back spring has been broken by taking them at a speed above a dozen miles an hour. Generally they are marked, and so, too, are dangerous cross roads, by the distinctive signs of the A. G. A. (the man who evolved this system of road signs knew the needs of automobilists).

From Le Mans, practically the gateway to Brittany, it is another hundred kilometers to Laval. Coming out of Paris, lunch at Nogent-le-Rotrou, at the Hotel du Dauphin. There is nothing of luxe here—simply plain, bountiful fare, cooked and served by the *patron-chef* of the hotel (*vin compris*), and charged for invariably at the same price, whether you be a peasant-farmer in town for the day

with a donkey cart loaded with vegetables or an automobilist in a flying "fifty," with a tonneau loaded with fair women. This is the charm of French travel by road. It's only in the resorts, like Biarritz, Vichy, Trouville or Aix-les-Bains, that one pays through the nose, as the French say.

Nogent-le-Rotrou is worth an hour after lunch, looking over its three mediæval monuments, its two churches dating from the tenth to the fifteenth century, and its eleventh-century ruined chateau, unspoiled by modern embellishments.

Where You Can Breathe the Atmosphere of the Middle Ages.

It is sixty-seven kilometers to Le Mans and seventy-five more to Laval, where you may sleep at the Hotel de Paris or keep on another thirty-five kilometers to Vitré, by which time the entire topographical aspect of the land has changed and become sterner, with more of the quality artists call character and less of the scenic prettiness of the stage.

Laval is really worth seeing. It is an admirable relic of an old mediæval town, with a twelfth century donjon, a Renaissance chateau, a twelfth century church and a fortified gateway, besides a history made vivid by its seigneurs of the moyen age. Indeed, Laval and its neighbor, Vitré, with an excursion to the Chateau des Rochers of Madame de Sévigné, are taken together, worth a day's sightseeing, if that's what you are out for, and probably it is. Thus keep Laval and Vitré on your route card.

Vitré's chateau is the best photographic subject among all the chateaux of France, save perhaps Langeais in Touraine, therefore don't forget to carry your kodak along with you.

At Vitré the Hotel des Voyageurs, besides the railway station, has good, but small, garage accommodations, and *chambres hygiéniques*, installed at the suggestion of the Touring Club de France. The combination, with the very excellent fare and the extremely moderate charges, will be hard to beat in all Brittany or Normandy. For that reason it is worth making a long day to arrive at Vitré for the night. The excursion to the Chateau des Rochers should not be omitted. It is five kilometers from Vitré, along a beautifully boulevarded roadway, quite different from what it was in the days of Madame de Sé-



"TROT, TROT TO MARKET" ON THE BRITTANY ROADS.

vigné when that accomplished letter-writer informed her daughter, Madame de Grignan, that "finally she had arrived," after having made the last league on foot, leaving her coach stuck among the rocks and mud of a slough.

There is nothing very massive about the chateau, but its ensemble is exceedingly picturesque. One may visit the chapel



HANDY WARNING SIGNS ARE EVER PRESENT.

and the *chambre* occupied by Madame de Sévigné, and may walk in the alleys and be told by the *concierge* that *par ci* and *par là* Madame la Marquise used to take her promenades. A very beautiful garden it is, too, designed by the great Le Notre, who laid out the gardens of Versailles.

Something About the Ancient Capital of Brittany.

If one will, he may go on to Rennes, thirty-five kilometers, the ancient capital of the province, but it's a stuffy, pompous hole with hotels always full to overflowing with congressionists of a medical conference or something of the sort, and automobilists have a scant welcome. The only thing of note to see at Rennes—its cathedral is abominably ugly—is the Council Chamber of the Palais de Justice where the Parlement de Bretagne formerly sat. This is not prejudice, but the writer has got a rule for touring which invariably works well: make your stopping place a small town, not a large city; leaving price out of the question, it's more amusing and the fare is better and more characteristic, and that verily is what one wants, or ought to want, when traveling by automobile.

Cut Rennes out, then, and go north from Vitre to Fougères, twenty-eight kilometers. Merely a sight of Fougères, *en passant*, is worth coming miles for. It is one of the best examples of a decrepit old walled town to be seen in France outside of Carcassonne. It is palpably a ruin, and its walls and towers and crenelated battlements and pinioned chateaux are all inextricably mixed in such a maze of architectural wonders that it looks more like a thing of the imagination than reality. Not many tourists—automobilists or others—"do" Fougères. This is a pity! Anyway pass through it en route for St. Malo, Dinan and Dinard.

From Fougères to Dinan, via Dol, is seventy-eight kilometers and about the same to St. Malo. The former is preferable, as it allows one to make a gorgeous excursion by a little steamer down the Rance to St. Malo and Dinard. It is a trip not to be missed by all lovers of the beautiful.

From Fougères to St. Malo, including the steamer trip, is good for a day. The Hotel de France et Chateaubriand—the ancient home of the author himself—is very good indeed, but a typical tourist hotel where one eats at one of those interminable long-drawn-out tables d'hôte, the curse of all resort hotels.

Sea, Sky and Land Form Color-schemes of Wondrous Beauty.

The historical monuments of St. Malo and its neighbor, St. Servan, their cathedrals, the Chateau, the old fortifications, the Tour Solidor, etc., are wonderfully interesting, and the green sea and blue sky setting of it all is as impressive as anything of its kind in nature or art.

From St. Malo westward to St. Briec is the Côte d'Emeraud, one of the beauty spots of the coast line of France. It is lined with little resorts and detached villas, and the panorama is only comparable with that of the Riviera—the Côte d'Azur and Biarritz, and about there—the Côte d'Argent, with, of course, quite a different color scheme.

From Dinan to Brest, almost to the extremity of Finistère, is something over two hundred kilometers of exceedingly pic-

turesque rising and falling route nationale. Generally speaking, the surface is good—the best in Brittany—but there are many hills of from eight to ten per cent., not so heavy in grade as the cross-country routes, say from Dinan to Vannes or from Morlaix to Quimper, but annoying all the same, for it's a continual coaxing and pushing of one's automobile in order to keep moving without being obliged to change speed.

After Dinan comes Lamballe, St. Briec and Guingamp, all of them typical Breton towns, peopled with a sturdy, dark-skinned folk, who, for a fact, are becoming so used to intercourse with strangers that they have lost not a little of their former picturesqueness. The *chapeau paille* and the *gilet rond* are giving way to an imitation *panama*—made in Madagascar—and a sweater knitted in Nottingham. Farther west in Finistère, and in the Penmarc'h peninsula, the costumes of the peasant men and women are, more or less, as they were a hundred years ago.

A detour of a hundred kilometers might be made from Guingamp, via the coast towns of Plouha, Paimpoul (where most of the women are widows, their menfolk having been mostly lost in the Newfoundland or Iceland fisheries), Tréguier (Rennan's birthplace) and Lannion. Practically this detour will take a day. There is much of interest en route and it's worth going slowly over the ground.

If one leaves Guingamp in the morning—a much better stopping place than St. Briec, it's only half the size, though both are full of quaint houses, curious shops and architectural surprises—he might lunch at Tréguier, spend an hour in the afternoon at Lannion, full of curious old wood and stone houses, or stop en route and have a look over the old Chateau de Tonquédec, ten kilometers distant. This last is a grand old ruin of the fourteenth century, with a donjon with walls ten or a dozen feet thick and all the accessories of a mediæval fortress-chateau.

The road drops down from Lannion in thirty-six kilometers through a wild, savage region with sharp descents to Morlaix, the Sous-Préfecture of Finistère. The Hotel de l'Europe is double starred in the Guide Michelin and the Hotel de Provence bears a single star, but the latter is decidedly preferable. Each has garage accommodation of a very acceptable kind.

Religious Ceremonial Remains Dear to the Sturdy Breton.

There are numerous sights at Morlaix in the town itself, and the excursion to the fourteenth century fortress, built by the bourgeois of Morlaix as a defence against the English, in the Rade de Morlaix, a great land-sheltered bay or harbor, should not be omitted from your visiting list.

Directly north of Morlaix, twenty kilometers out and back, is St. Jean-du-Doigt, a famous place of pilgrimage among the



Breton fisher folk of Finistère and the Côtes-du-Nord. In the church is preserved as a relic the index finger of the right hand of St. John the Baptist. The great religious fête, known as the Pardon of St. Jean-du-Doigt, takes place on the 23d of June in each year, and is perhaps the most celebrated of all these great religious pilgrimages of Brittany.

Northwest of Morlaix is the Pays de Leon and Finistère, a region to be "explored" by any automobilist who likes to get away from the beaten track. The roads are passable, that is, good enough as to surface, when they are not "loose" or broken up, but the hills are practically a continuous performance. It is a region away off from the rest of France, the "Land's End" of North Europe, and no one among its peasant population knows or cares for anything away from his immediate environs. *Essence* and *huile* are hard to find; there are only 110 automobiles registered in all Finistère, and this includes Brest, Morlaix and Quimper, which account for most of them. In the Côtes-du-Nord there are but 70, in Ile et Villaine 144, and in the Morbihan 59, making less than four hundred in all Brittany. No wonder that the native never ceases to marvel at *la mécanique* and marvel still more when you put in the "reverse." If you've got a "cut-out" from your exhaust box he flees in terror, thinking the whole thing is about to blow up. It will be some years yet before "*ces choses droles, ces automobiles*" will fully "arrive" in the wildnesses of Finistère.

Between Morlaix and Brest, Landivisian and Landerneau are interesting, but Brest itself had better be omitted. From Landerneau to Plougastel is a dozen kilometers, and the view over the great Rade de Brest is finer than anything from the other shore. For the night Plougastel-Daoulas is not bad. The Hotel des Voyageurs has been braced up quite recently by the Touring Club de France and is about the most modern thing in the hotel line in these parts outside the large towns.

From Daoulas, fifty or sixty kilometers out and back, will bring one to Crozon and Camaret. If you would like to know what it looks like first there is a picture of "Sardine-boats at Camaret," by Cottet in the Luxembourg Gallery at Paris. There are no sunsets quite so brilliant in western Europe as those over the bay of Camaret. If that interests you the detour is worth making, otherwise one reaches Quimper from Daoulas, via Chateaulin, by route nationale No. 170, in sixty kilometers.

From Quimper there is a hundred kilometers round to Douarnenez, Pont Croix, Pont l'Abbé and Penmarc'h that shows the best of Brittany; the quaintest, the least spoiled and the most picturesque customs and costumes of men and women.

The *coiffes* of the Breton women are the strangest and most varied in France, and those of the women of Penmarc'h, the Bigoudens, the quaintest of all.

Quimper has twenty thousand inhabitants, and if one excepts the great marine arsenal of Brest is the metropolis of Finistère.

From Quimper to Rosporden is twenty-two kilometers by the route nationale, Nantes-Quimper. Rosporden is a sleepy, dull town, with nothing to detain the tourist more than a glance of the eye, but it is the turning point for Concarneau—where the sardines come from.

Concarneau is ancient, picturesque and smelly, but it is delightful all the same, and the sea food served at déjeuner at the Hotel des Voyageurs will be remembered for long. *Langouste rémoulade* and *sardines fraîches* are *plats* which cost relatively large sums of money on the Paris boulevard, but here they are regular *plats du jour* and you pay three francs only (*vin compris*) for your déjeuner or dinner.

Americanism Has Invaded Independent Brittany.

Pont Aven for the night, at the Villa Julia, is the best thing to be had in Brittany. Julia years ago ran a modest little artists' hotel (for Americans, curiously enough), but to-day it has grown with prosperity until there is a great four-story brick and steel structure beside the little inn, and there are electric lights, electric bells and ice water on tap, also whisky—both

kinds—the American kind without an *e* and the Scotch kind with an *e*. Blanche Willis Howard's story of "Guenn" will tell you much of the life of the peasant folk of Pont Aven and ought to be read *on the spot* to be thoroughly appreciated.

There are fourteen water mills at Pont Aven and it is locally known as the *Ville des Moulins*. When we do the same thing in America we nickname a place Millerstown and let it go at that. As Laurence Stern said, "They do things better in France."

(To be concluded.)

BRITAIN'S USE OF FIRE BRIGADE AUTOS.

LONDON, June 11.—Automobiles for fire brigade service have found great favor in Britain and their use has been extended to the majority of the large cities. The latest convert to mechanical traction is the Birmingham Central Brigade, which has just taken over the smart vehicle illustrated. Made by the Wolseley Com-



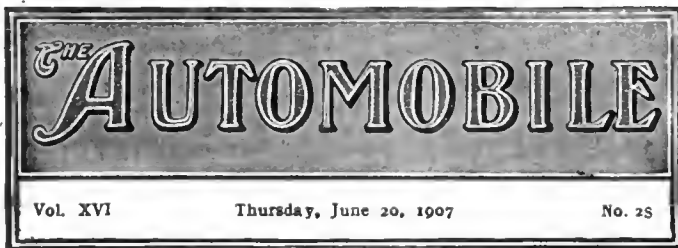
BIRMINGHAM'S "FIRE-LADDIES" ABOARD THEIR AUTO HOSE CART.

pany, at their neighboring works, the chassis has a 30-horse-power four-cylinder engine located beneath the driver's seat but readily accessible by removal of the floorboards. Two ignitions are provided to minimize risk of stoppage, this and the other constructional details following the standard omnibus practice of this firm. Four speeds are provided and side chains take the drive to the rear wheels. As the wagon is intended for city work a big maximum speed is not provided, twenty miles an hour being normal with full load. The body accommodates sixteen men and a supply of hose-piping and accessories beneath the seats. The preliminary trials have served to indicate that this vehicle will do good service at a cost much below that of the horse-drawn hose wagons.

A JOURNALISTIC WILD FLIGHT OF FANCY.

"Quite the most original device for protection against flying particles of sand, mud, and even stones, of which the racing automobilist is so much in need, was used by Fabry in the recent Targa Florio contest. His steering wheel, which was slightly larger than usual, was backed with mica, and constituted an excellent protection against the wind and dust, as will be seen by an examination of the accompanying illustration."

It is a New York automobile weekly which is responsible for the transformation of Fabry's steering wheel as described above. Unfortunately for the weekly's accuracy, Fabry's steering wheel was of the ordinary garden variety, as devoid of mica as the wheels of his car. *English Motor*, in one of its weekly facetious sketches, depicted Fabry behind an exaggerated wheel and suggested that it be enlarged still more, mica inserted so as to form a combined steering wheel and wind shield. A Parisian journalist, whose English was probably of the elementary school stage, mistook the London artist's wild fancy for a reality. The New York editor, apparently, must have missed the original and "borrowed" the idea from the French publication.



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Rise of a New National Institution.

From the small beginnings of the event inaugurated by the New York Motor Club a few years ago there bids fair to develop an annual observance of national importance—a national charity, in fact—Orphan's Day. The seed planted by the local organization has been fostered by the good offices of the American Automobile Association, and with the latter's aid its benefits were made far reaching, June 12 being observed as National Orphans' Day for the first time this year.

It would seem that there could be no greater charity open to the autoist than to devote his car for a few hours to the enjoyment of as many homeless waifs as it will carry; but, sad to relate, the private owner has not shown any great amount of enthusiasm in making this benefaction. Barring a few clubs, which for reasons of local convenience celebrated some other day, June 12 was observed as Orphans' Day in a number of cities, but it was the men who make and sell automobiles that supplied most of the conveyances. In other words, it was a trade event, rather than the public charity that was intended, and the number of cars fell far short of that required. It is sincerely to be hoped that next year a more generous response will be forthcoming to the appeal on behalf of this most worthy of charities.



Present Status of the Air-cooled Motor.

Certain developments of the past season have led a goodly portion of the automobile public to jump to sudden and wholly unwarranted conclusions regarding what may best be termed the air-cooled situation. Briefly put, these certain developments were nothing more or less than a sudden cessation of interest in the

subject on the part of two or three makers, their defection being signalized by bringing out a water-cooled car.

Many have been unable to see anything in this other than that the air-cooled motor had been tried and found wanting. More than one maker had put it to the test and then abandoned it. Nothing could be further from the actual state of affairs. The air-cooled motor long since reached a stage where it needed no defenders. By every test known to the engineer, it has been tried and not found wanting; many of the earlier fallacies concerning it have been brushed away, and in a hundred ways the air-cooled motor has been proved to be all that has been claimed for it, and a little more. But every buyer of a car is not an engineer—the public is not alone not discriminating in mechanical matters, but it is possessed of a tremendous amount of inertia. As a result, the manufacturer of air-cooled cars has been compelled to do a great deal of missionary work, and selling an air-cooled car to a new buyer means making a convert.

With the exception of those few makers who have developed highly specialized systems of air-cooling which are exclusive with them, and who in consequence have numerous special features of construction on their cars, the process of proselyting has been found expensive and burdensome. While the fact that as with steam, once well-converted means faithful to the end, is a great advantage, the work of constantly making new converts is one that the maker without a large and well-organized selling department has found constituted a task in which the game was not worth the candle. In some cases it was not alone necessary to make the convert, but keep him firm in his faith, as he was prone to ascribe other defections to the fact that the car was air-cooled. It soon became apparent that three water-cooled cars could be sold with less effort than it took to dispose of one of the other type where there were no special features to recommend it. Anyone who is conversant with trade conditions in this country is well aware that the average maker is quite willing at all times to give the public what it wants. He is in business to make cars, but he has to sell them, and in the long run he is going to make the car that sells the easiest.



Influence of the Auto on Machine-Tool Design.

From the manufacturer's point of view, there is little doubt but that the most revolutionary improvement brought about by the automobile has been in machine tools. It has been the cause of inaugurating new shop methods, but far more has it been responsible for the transformation of the shop equipment. The first automobiles were built of the most available and cheapest materials. But a very brief period of use was required to show their inadequacy for the purpose. Makers were willing to pay the cost, even though it were many times greater than what had been considered good enough for other purposes. Insistence and an open purchasing account finally won the day.

Then he found himself confronted by a totally new and unexpected problem. He now had the materials, but no machinery to work them with. To quote one of the most prominent makers in the country: "We found it a hopeless task to attempt to turn a piece of alloy steel in one of our old, small lathes. The machine chattered and jumped, threatening to go to pieces every minute. In the course of about two years we scrapped practically every tool we had in the shop and replaced it with new and heavy equipment at many times the cost, though the old machines were still good for several years' service on ordinary work." This is but a single instance of many. Practically every maker in the country has had the same experience, and its mark is visible in every department of machine tool equipment and shop practice. Such machinery represents a large outlay, so that in making it the automobile manufacturer has not blindly reproduced on a larger scale, but has introduced improved methods and processes. As in steel making, machine tool design has advanced more under the influence of the automobile than it would have in several times as many years otherwise.

SEALED BONNET CONTEST IS ON.

"Mollycoddle procession" was the playful title the Automobile Club of America's Sealed Bonnet Contest had earned for itself before the finish of the first half day, for the time allowance was so liberal, roads considered, that the schedule was a crawl all the way. But thus far it has proved one of the most successful contests ever held. Fine roads and beautiful weather contributed their share, while the cars did their work nobly. Every one of the 47 starters turned up promptly on time at Patchogue, and by 7:30 P.M. practically every one of them had made an equally consistent performance of the slow run back and had either already been checked in at the clubhouse or was waiting its turn at the elevators. S. B. Stevens' 16-20-horsepower runabout, carrying No. 46-A, was the last to start, and consequently finished latest through a strict observance of the spirit of the contest rules. He reached the clubhouse at 9:41, his maximum time being 9:53:00. There was a remarkably small amount of tire trouble all told. The De Luxe rolled in on a flat rear tire, of which its occupants were blissfully ignorant until someone at the club asked if the car ran better that way, but it was about the only one of the 47 to finish that reported anything of the kind, the Darracq evidently getting far more than its share in this respect. The 35-horsepower Oldsmobile runabout driven by W. Folberth and carrying 27-B was the first to check in on the return at 5:27, followed by the three Locomobile touring cars at 5:30 and after that they came so thick and fast that 54th street was blocked and the clubhouse checkers rushed to death. The Haynes runabout with C. B. Warren at the wheel, that took honors in its class in the recent mudlark tourney to Albany, was a prominent early arrival, while the Mora runabout 32 B, driven by W. H. Birdsall, had the distinction of having done the distance on five gallons of gasoline.

As of old, of course, not a few of the contestants declined to be bound by such limitations on the way out to Patchogue from Newtown and "let her out some" to preserve tradition in such affairs, and not let the custom of racing for controls die too easily. As a result the sleepy little Long Island town on the south shore received its first notice of the advent of the contestants by the arrival of a pair that trooped in about half past eleven. These were the De Luxe 24-A driven by C. S. Beach, with the Glide, 4-B, driven by J. C. McCafferty, at its rear wheel, and they had maintained that position all the way out, so that the occupants of the latter car were considerably heavier than when they had started by the addition of a liberal coating of Long Island realty.

Then there was a lull of almost half an hour while the first arrivals formed centers of interest for the local gentry who gathered to inquire what it was all about. Shortly after midday they were supplemented by scattering pairs and single arrivals that soon swelled the procession, and as the cars ran about a mile or so east of the town to check in at the official turn and came back to "stoke up and lubricate," the quiet main street took on an air of animation. It was dusty, very dusty, but that there was no necessity whatever for piling it on one another was amply demonstrated by the trip back. If there has ever been another more orderly "take it easy" procession than the one that characterized the return trip on Wednesday afternoon, no one who has followed American automobile contests ever since there have been such things can remember.

Before starting out in the big De Luxe that brought us back, times and distances were figured to the minute and we rolled along in an easy-going fashion that brought a stare of surprise from other autoists who sped by on the road, going at what is an ordinary pace for the automobile. Ours was "fifteen per," by the autometer, but it seemed more like five, and just to be able to kill a little more time the photographer was given plenty of opportunity to press the button on a number of charming scenes that the eastern end of the south road affords.

HOW THE GRAPHIC CUP WAS WON.

DOUGLAS, ISLE OF MAN, June 8.—The touring car race for the Graphic Cup has just completed the programme of the Manx meeting. Any powered touring cars costing less than \$5,000 are eligible under the rules of this annual competition.

Hutton's 60-horsepower Berliet got away first and managed to do fastest time in three minutes and forty seconds, equivalent to forty-five miles an hour. The 40-horsepower Berliet, owned by Watson, took second place, with three minutes, forty-five seconds, and a similar car driven by Porapato, who, together with Hutton, drove a Berliet in the Tourist Trophy race, was placed sixth.

The event was not without its excitement, for after yesterday's adverse weather the roads were in the worst possible condition. All the cars found some difficulty in keeping on the road, and unluckily No. 13, a 45-horsepower Ariel, smashed up at the corner which had already claimed the Napier and Daimler as victims. The occupants of the car were thrown out and serious injury resulted to one unfortunate. A 35-horsepower Daimler which was running well broke a chain near the finish, otherwise Daimlers might have done better than take third place. No American car was entered, but several automobilists on tour attended.

POPE MANAGERS HOLD THEIR ANNUAL DINNER.

HARTFORD, CONN., June 17.—On Thursday of last week the Pope managers and their assistants "got together"—that is, they had their annual round-up meeting in Hartford to talk over business plans, and taking a run later in two Pope-Hartford and two Pope-Toledo touring cars to Middletown, where they became the guests of Albert L. Pope, Vice-President of the Pope Manufacturing Company, at dinner. From Toledo came A. E. Schaaf and Harold L. Pope, manager and assistant manager of the Toledo plant, as well as F. C. Gilert, the sales manager. Manager H. H. Rice and his assistant, W. C. Johnson, came from Indianapolis; Robert E. Beck reported from Hagerstown, and E. Hinsman, general manager of the Westfield factory, was in evidence, as was also M. V. Kelley, a publicity man of Toledo, who handles a large share of the Pope interests. Colonel Albert A. Pope came early and staid all day. At the dinner there were in addition to the above, Colonel George Pope, Charles E. Walker, W. C. Walker, Robert L. Winckley and C. E. Morrow, all of the Hartford plant; C. E. Lozier, manager of the Elyria factory, and M. L. Lawrence, superintendent of the Hagerstown plant.

FIFTEEN FRENCH 'BUSES FOR FIFTH AVENUE.

PARIS, June 13.—New York has come to Paris for a supply of motor 'buses for its aristocratic Fifth Avenue, L. K. Clark, of the New York Transportation Company, having placed an order with the Motor Car Emporium, Limited, of London, for fifteen De Dion Bouton gasoline omnibuses similar to the two hundred at present in use in the British capital. Although manufactured at Suresnes, near Paris, this type of 'bus is better known to Londoners than to Parisians, owing to the more general adoption of this form of locomotion in London than in Paris. Numbers of them, however, are in use in France on long journeys between a series of villages, where the railroad has not yet penetrated. It is expected that the 'buses, which have seating accommodation for thirty-four passengers and are similar in body work to the one now being used experimentally on Fifth avenue, will be in active operation by the end of July.

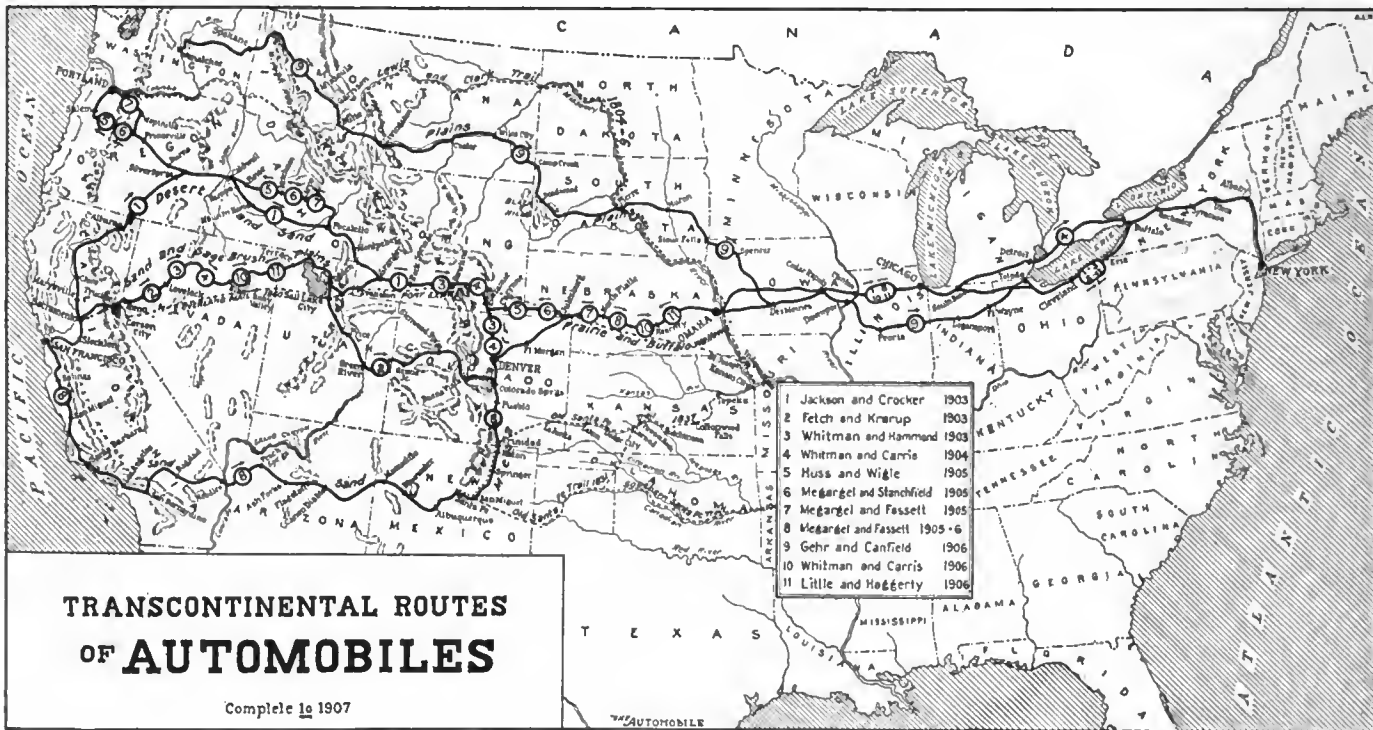
EDITOR BATCHELDER NOW A BENEDICK.

Wednesday morning, June 12, Amos Grant Batchelder, managing editor of THE AUTOMOBILE, was married to Mrs. Lottie De Wolfe Bates, of Boston, at the Harvard Congregational Church, Brookline, Mass., the Rev. Oliver D. Sewell officiating. The wedding was private, only a few intimate friends of the bride being in attendance. Mr. and Mrs. Batchelder are now enjoying a brief honeymoon in the Adirondacks. Their numerous friends unite in extending congratulations and best wishes.

TRANSCONTINENTAL FEATURE OF THE BLUE BOOK

THOUGH road information on an extended scale is practically a new departure in this country, great progress has been made in these lines during the last two or three years. For the first time it is possible for automobile tourists to secure reliable information that will enable them to plan trips from any point on the Atlantic seaboard—from Calais, Me., to Norfolk, Va., inclusive—into and through the Middle West by the most practicable routes, with good accommodations practically all the way.

edition, and with it appear tables showing the date of start, date of finish, time, place of start, place of finish, names of drivers, make and principal specifications of cars making each one of these trips, including the three transcontinental motorcycle trips between the Atlantic and the Pacific. Nearly everyone of these long trips has been made in a strenuous fashion, with record-breaking part of the original plan, as the tables themselves show. It will be noticed that all of these long runs followed practically



From the Official Automobile Blue Book, slightly reduced in size.

The three volumes of the 1907 "Official Automobile Blue Book" contain descriptions and maps covering in the aggregate about 50,000 miles. While this is only a small proportion of the total mileage of highways, it contains by far the best routes threading the entire territory.

The engraving shows one special feature of the 1907 "Blue Book" that has never been attempted before—a summary of the eleven transcontinental trips that have been made up to the present time. This drawing, somewhat larger than the accompanying map, is one of the supplementary features to the New York State

the same course from New York to the Missouri river, but from that point west they diverge into four general routes. This was due principally to the place of start or destination of the different trips, and not to any special difference in the road conditions, as there is no good highway between the Missouri and the Pacific ocean. To add to the interest of the diagram as a whole the overland mail route—Pony Express—and the old Santa Fé trail have been charted out, showing how the automobile has used in part the pioneer routes of the mail and commerce across the plains and the mountains.

TABLE OF TRANSCONTINENTAL AUTOMOBILE TRIPS—TO 1907

Date of Start	Date of Finish	Time	Place of Start	Place of Finish	Name of Drivers	Make of Car
May 23, 1903...	July 26, 1903...	63 days.....	San Francisco, Cal....	New York.....	Dr. H. Nelson Jackson... Sewall K. Crocker.....	Winton—2 cyl., 20 H.P.
June 20, 1903..	Aug. 21, 1903...	61 days.....	San Francisco, Cal....	New York.....	E. T. Fetch..... M. C. Krarup.....	Packard—1 cyl., 12 H.P. "OLD PACIFIC"
July 6, 1903..	Sept. 17, 1903...	73 days.....	San Francisco, Cal....	New York.....	L. L. Whitman..... E. I. Hammond.....	Oldsmobile—1 cyl., 8 H.P.
Aug. 1, 1904..	Sept. 3, 1904...	32 days, 23 hrs., 20 min...	San Francisco, Cal....	New York.....	L. L. Whitman..... C. S. Carris.....	Franklin—10 H.P.
May 8, 1905..	June 21, 1905...	44 days.....	New York.....	Portland, Ore.....	Dwight D. Huss..... Milford Wigle.....	Oldsmobile—1 cyl., 8 H.P. "OLD SCOUT"
May 8, 1905..	June 21, 1905...	51 days.....	New York.....	Portland, Ore.....	P. F. Megargel..... Barton Stanchfield.....	Oldsmobile—1 cyl., 8 H.P. "OLD STEADY"
Aug. 19, 1905..	Nov. 10, 1905...	84 days.....	New York.....	Portland, Ore.....	P. F. Megargel..... David Fassett.....	Reo—2 cyl., 16 H.P.
Nov. 21, 1905..	June 9, 1906...	201 days.....	San Francisco, Cal....	New York.....	P. F. Megargel..... David Fassett.....	Reo—2 cyl., 16 H.P.
June 7, 1906..	Nov. 28, 1906...	175 days.....	Wenatche, Wash.....	New York.....	Wm. S. Gehr and wife. W. E. Canfield and wife.	Glide—4 cyl., 36 H.P.
Aug. 2, 1906..	Aug. 17, 1906...	15 days, 2 hrs., 10 min...	Stockton, Cal.....	New York.....	L. L. Whitman..... C. S. Carris.....	Franklin—6 cyl., 30 H.P.
Aug. 16, 1906..	Sept. 9, 1906...	24 days, 8 hrs., 45 min...	New York.....	San Francisco, Cal....	Richard H. Little..... D. Haggerty.....	Buick—2 cyl., 22 H.P.

EARLY SUMMER ACTIVITIES OF THE CLUBS

Rochester to Hold Its Auto Gymkhana on June 29.

ROCHESTER, N. Y., June 17.—Owing to the fact that many automobilists will be out of the city for the Fourth and will not return for several days thereafter, the gymkhana sports of the Rochester Automobile Club, which were to be held at Genesee Valley Park July 6, will be held at that place on June 29. Invitations have been sent to the members of the Buffalo Automobile Club to come and compete, and the contests will be open to all owners of cars in Rochester, whether they are members of the local club or not.

There will be eleven events: a half-mile speed contest; 100-yard dash, standing start, the front wheels to cross line and then reverse 50 feet; 100-yard dash with one front wheel running along a hundred feet of narrow wooden pathway; obstacle race; tilting at rings; dropping stones or balls into buckets along a 100-yard course while driving at the rate of 15 miles an hour; brake contest; balancing contest; potato race; needle threading contest, open to electric cars only and to have women passengers; riding for scarfs.

All entries must report to the secretary fifteen minutes before the opening of the first contest. Not less than three prizes will be offered in each event, and it has been planned to have these peculiarly suitable to automobile owners. The committee in charge of the sports is composed of H. T. Strong, chairman; H. S. Woodward, William Barry, Jr., J. S. Bingham, A. F. Crittenden, F. E. Mason and Rudolph Schmidt.

The Rochester Automobile Club is planning a return invitation to the Rochester Yacht Club, which promises to be quite an event. Plans are also being made for a great automobile day for Rochester. The road sign work starts this week and there has been low rate automobile insurance secured. The chauffeurs' registration bureau is started and the membership is growing every day. Arrangements have also been made by the club by which any member wishing to visit or tour Canada by communicating with Secretary Van Tuyle have all the bother and trouble in regard to bonding machine, putting up bond, etc., taken care of without any trouble to themselves.

Chicago Automobile Clubhouse Opening Is in Sight.

CHICAGO, June 17.—Fearful lest the pranks of the conscienceless weather bureau or the dilatory tactics of an unsympathetic contractor may cause another upset of their plans, the directors of the Chicago Automobile Club are delaying positive announcement of a date of the housewarming in the new Plymouth Place structure. It is positively certain, however, that within three weeks' time the club's new home will be occupied. On the evening when the doors are first flung wide the members of the club will make their acquaintance with the interior of the structure, which is expected to serve not only as the headquarters for automobilists of Chicago but for the entire Mississippi Valley district. A few evenings later the first ladies' night will probably be observed. As the labor of the builders has approached an end the full scope of the architects' plans have become manifest and high praise is being accorded them for the attractive decorative effects secured throughout the building.

On the garage floors all work was completed some days ago, but it was decided not to open the garage for storage of cars before the entire building was ready for occupancy. In the culinary department, which is located chiefly on the third floor, every effort is being directed toward completing the installation of fixtures in good season for the opening.

The Chicago Automobile Club is distributing a 24-page booklet containing the new automobile law of Illinois, which goes into effect July 1. The work is of vestpocket size, appropriately indexed, and contains a number of explanatory notes by Sidney S. Gorham, the club's efficient secretary and legal adviser.

Revising the Rules for the Quaker City 24-Hour Race.

PHILADELPHIA, June 17.—The committee having charge of the coming 24-hour race of the Quaker City Motor Club, on the 28th and 29th of this month, is determined that no possible chance for a protest shall be afforded, such as marked the conclusion of the similar event held at Point Breeze track some weeks ago. Second place was jeopardized in that event by the Frayer-Miller crew pushing the car over the tape after the car had been laid up for repairs. A set of rules governing the running of the race has been promulgated, and the one covering this point reads as follows: "Contesting cars must be running under their own power at the conclusion of the race to receive an award of position."

Wholesale rebuilding of a wrecked car, such as followed the smash-up of one of the contesting Dragons in the last race when it somersaulted through the rail, is aimed at in the following paragraph: "Each contesting car will be allowed five mechanics for replacements." It will be recalled that fully a score of men were put at work on the Dragon and had it in shape for going again in less than two hours. But for some such rule a local manufacturing concern would have a marked advantage over a firm which has possibly sent its car hundreds of miles to enter the race, and with but half a dozen or few men to attend to it.

Another rule prohibits the filling of fuel tanks or the making of even minor repairs on the track. Any such replenishments or repairs must be done in the respective camps, which will all be located in the infield, the parking spaces, which are usually located there, being relegated entirely to the outside.

Additional lighting facilities will be installed, and reflectors will be used to throw the rays ahead and keep the glare out of the drivers' eyes.

The field, if anything, will be larger than in the last event. Two new cars which will start will be the Loziers, entered by Harry Michener and Ralph Mulford, of New York.

Perfect Score Contestants Refer Cup Back to Trustees.

NEWARK, N. J., June 17.—It was hoped last week to narrow the field of contestants in the recent New Jersey endurance run who finished with a perfect score, by a 24-hour non-stop contest, but all plans of that nature were set at naught by the action of the race committee, which, after a meeting, called the owners of the twelve perfect score cars together again on Thursday and refused to accept the plan which had been suggested for disposing of the cup, thus reopening the whole matter. After considerable discussion the contestants decided to leave the matter with the committee with the recommendation that the cup be left in the custody of the trustees of the club with power to act. The committee endorsed this recommendation, and now the question of the disposal of the cup is simply transferred from the race committee to the board of trustees.

There is much talk now of whether or not the club officials will consider it advisable to make the endurance contest an annual fixture. Several contestants voiced the opinion Thursday night that no contest could be arranged on the roads of New Jersey which would be within the limits of the law, and yet in which several of the competing machines could not finish with perfect scores, and cited the repeated and futile attempts of the committee handling the Long Island endurance contest to narrow the competitors down to one clean score. A contest in which medals or certificates should be given to all who competed without penalization was favored.

Grand Rapids Club Plans a Run to Detroit.

GRAND RAPIDS, MICH., June 17.—The touring committee of the automobile club is making arrangements for a run to Detroit to compete for a silver cup offered by President George of the State

association. The date has not yet been set, but the committee plans to bring off the event soon.

Agitation has started in the city hall to keep the autos from the parks this summer. The idea is that the dust raised by the autos injures plants and flowers, endangers the lives of children, and is in general a nuisance. These, however, are the ideas of the extremists, and when it comes to carrying them out it is not thought they will have any support. The club itself is in favor of speed regulation, but the members feel that they have as much right to the parks as anybody.

City and Country M. C. Will Celebrate July 4.

NEW YORK, June 18.—The City and Country Motor Club has announced a jollification for Independence Day. The glorious Fourth will be celebrated by a big run to the Lake Mahopac Club-house and an outing during the day on the lake and grounds. In the afternoon there will be a promenade concert by the Thirteenth Regiment band, and there will be athletic games and water sports on the lawn and lake. In the evening there will be special fireworks and a lawn fête, with moving pictures and other entertainments. Arrangements have been made for additional ac-



LAKE MAHOPAC CLUB HOUSE, OF C. AND C. M. C.

commodations in nearby houses for the overflow from the clubhouse of those who wish to remain over night at the Lake Mahopac headquarters. The run will be from the 109th street city clubhouse early in the morning.

Albany Club's Seven Day Tour Starts To-day.

ALBANY, N. Y., June 20.—A score or more strong, the third annual tour of the Albany Automobile Club left the capital city to-day with horns tooting and the occupants of the cars in the gayest of moods. The tour is to be of seven days' duration and will cover a total distance of 660 miles, the route taking the tourists to Atlantic City via Asbury Park, N. J., and returning via Trenton.

MR. HOLLANDER MAKES A BUSINESS CHANGE.

E. Rand Hollander, who is one of the best known members of the auto import trade in this country, last Saturday resigned his office as vice-president of the Hol-Tan Company, of New York City, importers of Fiat cars, thereby severing his connection with that concern. He sailed on Thursday for Europe to conclude negotiations for one of the largest international automobile deals yet put through.

Though Mr. Hollander declined to state anything regarding his plans, it is understood that a syndicate has been formed for the manufacture in this country of a famous foreign car, and that he is going abroad to sign the contracts for the purpose.

AMERICAN CARS IN IRISH RELIABILITY TRIALS.

DUBLIN, June 7.—While the Royal Automobile Club busies itself with fuel limit races and formula-handicapped hill climbs, the important task of organizing reliability trials has devolved on the sister associations of Ireland and Scotland. The annual trials starting from Dublin and from Glasgow rank as two of the principal competitive events of the year and the organizers have the pleasure of seeing the entry lists mount up without trouble to the limit of efficient management.

In the main section of this present event the Irish Automobile Club received fifty-one entries, which were grouped in seven classes on a price basis. A further section was provided for members and private owners, and some twenty-one cars ran under this heading. America was represented by six vehicles, a 32-horsepower Maxwell being piloted by its owner in the private section, and two Cadillacs, two 15-horsepower Fords and a six-cylinder Ford running in the main body.

The weighing in caused much amusement by the serious determination of the clerk of the scales to portion out the necessary sand ballast to the nearest ones, and this conscientious spirit was shown throughout by the observers—rumor alleging that one driver got into trouble for winding up the dashboard watch. The four days' run commenced on Wednesday morning with a trip north to Portrush, one hundred and fifty miles of mixed roads which proved a pleasant surprise in view of their anticipated roughness. The sixty-eight cars which turned up were sent off at minute intervals, but for some reason the order of starting placed the higher powered cars last, rendering a great deal of passing necessary before the close of the day's run. Fifty-nine non-stops were recorded for this day and the remainder all managed to report before the close of schedule time.

Thursday's course led back to Dublin by the inland road through Armagh, a run of 173 miles, sufficiently long when the legal twenty mile and hour limit has to be followed. After passing through Coleraine the procession headed for the nine-mile stretch of beach locally styled Magilligan's Strand. A plank track marked out a safe course over the soft sand and the fine surface soon reached well repaired the trouble.

In the below \$1,200 class the 10-horsepower Adams-Hewitt did best with a speed of 34 1-2 miles an hour, the 15-horsepower Ford coming next with 33 and the Cadillac two-seater with 30 miles per hour. Below \$1,750 the 16-20-horsepower Calthorpe averaged 42 miles an hour, 8 miles an hour above the next best.

After the speed event the road to Armagh was resumed, but elimination soon commenced, ten in all being absent at the end of the day's run. The majority of these withdrawals were occasioned by the stringent rule disqualifying any car which experienced a stop of longer than one hour.

Waterford was the objective of the third day's run, which included a timed hill climb at Hollywood Hill, over a mile of 1 inch 12 average gradient. The Ford and Cadillac again did well in their class, taking second and third places. The route lay through some of the finest of Irish scenery, but the good weather suddenly failed at lunch time and mist and drizzle were the main features of the trip to Waterford. Fifty-five arrivals reported themselves to headquarters, forty-seven having no trouble.

On the Saturday return to Dublin a timed ascent of Graiguenamanah Hill enlivened the proceedings. The Cadillac took top place in Class B, with the four-cylinder Ford a close second.

Fifty-three cars completed the 569 mile trial, and altogether 34 made entire non-stop runs. In the B Class none of the eight cars were successful in running through with a clean sheet, and so the Cadillac with its two non-stop and the Ford with three to its credit have good chance of award. On the other hand, in Class F, in which the six-cylinder 40-horsepower Ford was placed, all thirteen made complete nonstop performances with the exception of the Spyker, which had experienced no delay till its damaged axle caused its retirement on the last day. The results and final placings will not be known for some weeks, both cost and fuel consumption as well as reliability and the timed tests being considered by the committee.

LOCOMOBILE INSTRUCTION BOOK FOR 1907 CARS.

In preparing an instruction book for the maintenance of its 1907 cars in the hands of the private owners, the makers of the Locomobile have left no stone unturned to render this handy little volume as exhaustive as it is possible to make such a work without going into abstruse technicalities, that frighten the average man at first glance and cause him to lose all interest in the attempt to master its contents, simply because he does not understand the matter and will not be bothered to learn it. It is divided into eighteen chapters, covering every essential of the car, treating them in the order of their importance to the beginner, such as "Lubrication," "Cranking the Motor," "Changing Gears," and the like, then taking up constructional details and the care needed in their maintenance in later chapters, twenty-seven easily understood drawings being used to supplement the text and render it clear. Every possible phase of taking care of the car is treated at length and in such a manner as not to puzzle the veriest tyro, with an additional chapter or two as an appendix for experienced drivers and repair men, though, as a matter of fact, there is a great deal contained in the body of the work that it would benefit this gentry to read and digest. It is safe to say that no Locomobile owner who will take the trouble to "know his little book" thoroughly will encounter much in the shape of breakdowns that will stump him. For convenience in carrying it is sent out by the makers—the Locomobile Company of America, Bridgeport, Conn.—in a neat leather pocket case, which also provides accommodations for other papers. The purchaser's name is stamped on the inner fold in gilt letters.

BUICK AND JANNEY COMPANIES CONSOLIDATE.

FLINT, Mich., June 17.—The new Janney Motor Company, which has been in process of organization for some time past, was consolidated with the Buick Motor Company last Monday. While losing its individuality in the merger, the Janney cars will bear this name and will be turned out in a separate plant at Flint, where there was talk of locating the factory even before the consolidation. At the same meeting, held last Monday, an increase from \$1,500,000 to \$2,600,000 capital was voted at a special session of the stockholders of the Buick Motor Company. This only concerns the common, the preferred stock remaining at \$600,000. A special meeting of the stockholders of the Whiting Motor Car Company has been called for to-morrow at Jackson, Mich., to vote on the project of also combining with the Buick Company. In any event the plant will remain at Jackson.

The Buick factory at this place is progressing rapidly, the contract for the main building calling for its completion by August 1. This building is 756 feet long by 70 feet wide and two stories high, making it one of the largest of its kind in the country.



EXECUTIVE HEADS OF THE POPE-TOLEDO PLANT.

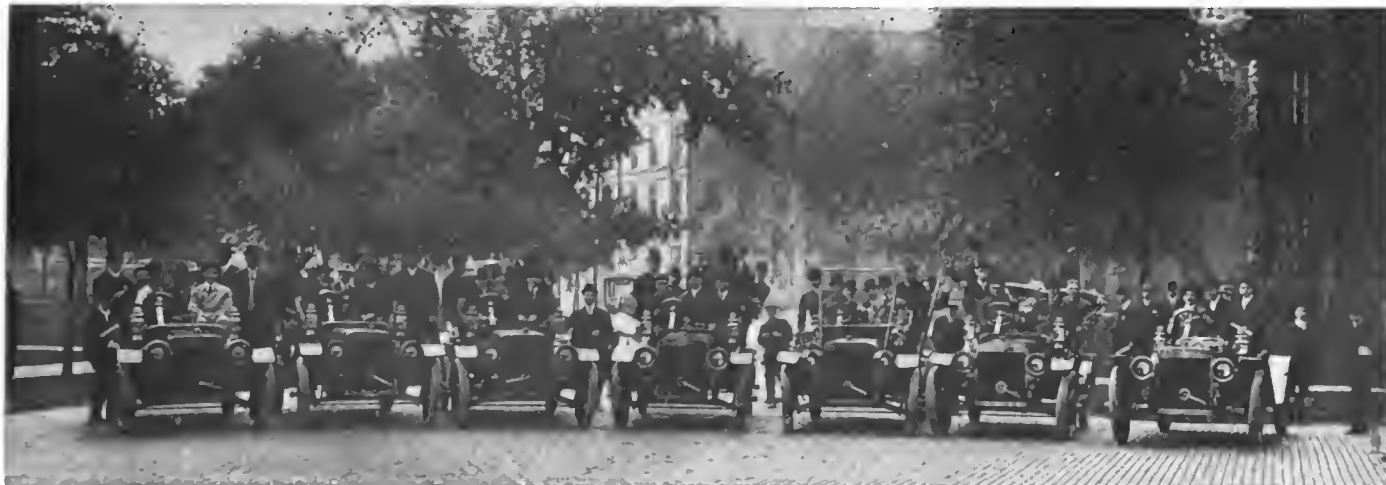
General Manager Albert E. Schaaf is at the wheel. Assistant Manager Harold Pope occupies the seat at his left. In the middle seat in the rear is F. C. Gilbert, Sales Manager. the others being members of the sales department.

TOLEDO HAS A NEW AUTO PARTS INDUSTRY.

TOLEDO, Ohio, June 17.—Toledo is to have a new automobile industry in the Toledo Auto Parts Manufacturing Company, which has been incorporated with \$50,000 capital and which has already begun installing machinery in the old plant of the Kirk Bicycle Company. The concern is headed by W. N. Taylor, for nearly three years general superintendent of the Toledo plant of the Pope Motor Car Company. Others interested in the concern are C. F. Cook, manager of the Globe Machine Company, G. Ohlinger, T. B. Earl and D. White. It is the intention of the company to manufacture all sorts of automobile parts, as well as rebuild and repair automobiles. The company will occupy the old De Luxe factory.

CONTINENTALS ON FIRST HERKOMER SEVEN.

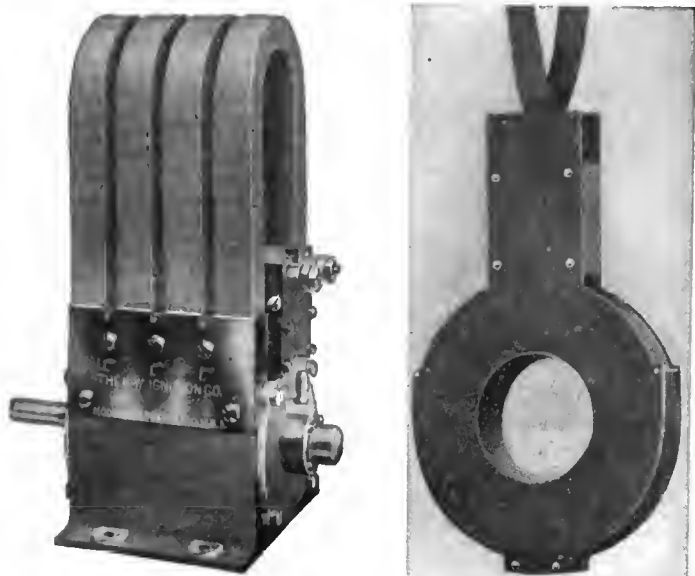
Tires have spelt defeat more often in a great road race than any other single factor—in fact, the cars themselves have been brought to a point where victory or defeat is almost entirely a matter of the tires used, and the use of tires that cannot stand the pace invariably means a poor showing. In view of this, the report by cable recently received by the New York office of the Continental Tire Company, that the winner of the Herkomer Tour, Edgar Ladenburg, drove a Mercedes shod with Continentals, and that the next six cars to finish also had the same tires is certainly a matter of congratulation. In addition, the first, second and third cars to finish in the Forsten-Rieder Park Race and the first three to finish in the Kesselburg hill climb were all equipped with Continentals.



THE ADCRAFT CLUB, DETROIT'S FAMOUS ADVERTISING MEN'S ORGANIZATION, ENJOYING A RUN IN FORD SIXES.

NOVEL FEATURES OF THE K-W MAGNETO.

Under the title of the "K-W Ignitor," a firm of the same name—the K-W Ignition Company, Whitney Block, Cleveland, Ohio—is marketing a novel form of inductor generator that embodies a number of original features. Both electrically and mechanically it has been reduced to that ideal simplicity which makes for enduring reliability, an essential of paramount im-



EXTERIOR VIEW OF MAGNETO. FIBER-ENCLOSED STRIP WINDING.

portance in all ignition apparatus. A permanent field consisting of four powerful horseshoe magnets constitutes the electrical foundation of the machine, while the inductor consists of two laminated iron rotors placed at right angles and keyed on the shaft. Between them is placed the stationary strip copper winding in its fiber housing, so that there are no moving contacts and nothing to wear but the main bearings, which are of substantial size, which is also true of the shaft, so that with the necessary lubrication the machine will run indefinitely without attention. A view of the complete machine is shown above.

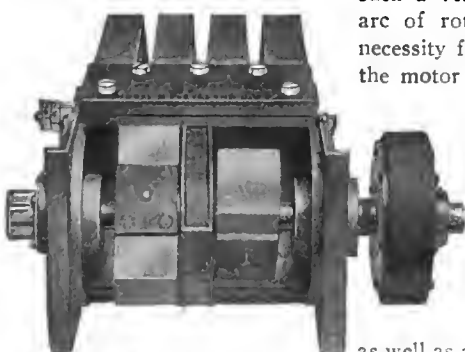
The makers claim for this magneto that, on account of its generating line waves, the neutral point of the machine represents

such a very small portion of the arc of rotation that there is no necessity for synchronizing it with the motor to which it is attached.

To insure this the magneto is arranged to run four times the speed of the motor, or eight times faster than the timer, thus minimizing the angular period of no current. Extensive trial,

as well as a number of machines in daily use, variously run by friction, belt and gearing, demonstrate that

any difference in operation resulting from synchronized attachment and loose driving is a negligible quantity. It is not designed to operate as a self-contained unit, but simply to act as a source of current supply for the usual vibrator coil equipment in lieu of a battery. The wiring connections are the same, and, as the machine generates a powerful current at an extremely low speed, no batteries are needed for starting. The magneto shaft is carried on high-duty ball-bearings running in grease, so that oiling is not necessary more than once a season. Cockcroft & Ballou, 122 West Thirty-fourth street, New York City, are Eastern and foreign distributors for these magnetos.



VIEW FROM BENEATH, SHOWING ROTOR.

HART-KRAFT COMPANY STARTS ITS PLANT.

YORK, PA., June 17.—Ground was broken to-day for the plant of the Hart-Kraft Motor Company, a new corporation which was recently organized in this city. The plant with equipment will cost approximately \$50,000, half of which will be for equipment. The building will be four stories, of brick construction, with a frontage of 115 feet and depth of 64 feet, in the principal manufacturing district of the city.

The capacity of the plant when in full operation will be three cars a day. The company intends to make a specialty of two kinds of cars, a delivery car with a capacity of 700 or 800 pounds and a runabout, both of which will be sold at \$850. The officers of the new company are: L. M. Hartman, president; R. H. Shindal, vice-president; Granville Hartman, treasurer; Donald H. Yost, secretary; Jonathan Jessop, John W. Hartley and John H. Hartman, are other members of the board of directors.

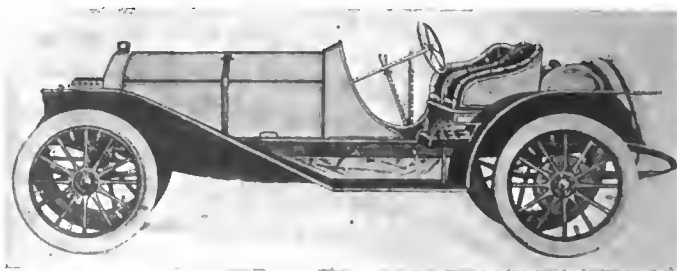
FINE PERFORMANCE OF MIDGLEY TREADS.

In the recent twenty-four-hour race at the Point Breeze track, Philadelphia, the Autocar that carried off the victory was equipped with Midgley tread tires that had already been run a matter of 3,000 miles before going on the track, in spite of which they finished the 791 miles of grinding round the circle track with no other trouble than two punctures. With the aid of the Midgley detachable rim, these were repaired in 2:10 and 1:50 respectively, and the car was again in the running.

After a short time in running on the road the upper side of the four steel piano wire coils that are embedded in the tread wear off, leaving thousands of inverted staples sticking through to grip the road. The Pope-Hartford that recently won the Mexican road race was also equipped with the Midgley treads, and Herbert Lytle has specified them for his Vanderbilt cup car.

A NEW RUNABOUT SIX FROM YORK STATE

W. Mason Turner, who has been identified with the business of selling automobiles ever since 1898 and who for the past year and a half has been sales manager of the American Locomotive Company's New York office, has recently been elected president and general manager of the Colt Runabout Company, of Yonkers, N. Y. As suggested by the title of the concern, its object is to place a line of runabouts on the market, known as the Colt and equipped with a six-cylinder motor. The power plants are to be supplied by the Howard Motor Works of the same city, W. S. Howard being well known as the former chief engineer of the Gas Engine and Power Company. Some idea of the lines of the new runabout may be obtained from the illustration of the latest newcomer in this field at the head of the column. It is a fast and business-like appearing car and is designed with ample clearance and a low center of gravity.



COLT SIX-CYLINDER RUNABOUT—THE LATEST COMER.

No rumble seat is intended to be used, the short space back of the seats being designed to accommodate a 20-gallon gasoline tank, beside tools, spares and tires. A detachable mechanic's seat is carried and when in use is fastened to the left hand running board. The wheelbase is 105 inches and the wheels measure 34 by 4 inches all round.

BRIEF ITEMS OF NEWS AND TRADE MISCELLANY

A. Elliot Ranney & Co., New York agents for the Elmore, have sold 38 cars of this make so far this season, from which it would appear that the three-cylinder motor is still an important factor.

Wichita, Kans., has been selected by the Solid Axle Automobile Company, of Toneka, that state, as the location for its new factory. The company is capitalized at \$200,000. L. K. Mannis is president, and O. H. Osborne general manager.

Requests for literature descriptive of Columbia cars from abroad would seem to indicate that the American automobile is becoming widely known in foreign countries, particularly as many of these inquiries received by the Electric Vehicle Company come from very distant places.

"Like father, like son," is a saying that applies to automobiling as well as other things, as witness the fact that Commodore H. C. Roome, the well-known autoist and yachtsman of Miami, Fla., has presented the Lozier which he drove all last year to his son and has invested in a 1907 40-horsepower model of the same make.

When leaving for the other side with his Grand Prix racer, Walter Christie took with him three sets of Diamond tires, which he will use in the race on his own make of removable rims. He has used Diamond tires in his previous races, but this year has adopted larger sizes, employing 34 by 4½ on the driving wheels and 34x4 rear.

Among the six-cylinder cars to participate in the Glidden tour will be the Rolls-Royce touring car of S. B. Stevens. Mr. Stevens at first intended to drive his runabout of the same make, but later changed his mind and will compete with the touring model as a member of the New York Motor Club, of which organization he is the president.

The Harrison Wagon Works, Grand Rapids, Mich., has decided to dispense with its automobile manufacturing department. Superintendent William A. Hatcher and G. A. Anthony have been authorized by the trustees to dispose of the autos in stock and in process of construction and the machinery, all of which is inventoried at \$182,000.

The Monarch Motor Car Company, Chicago, whose plant recently suffered a disastrous fire, has acquired a tract of fifteen acres at Chicago Heights, and will at once begin the erection of new factory buildings. The main structure will be 350x500 feet, of brick, steel and concrete construction, with saw-tooth roof, and steel frames will be used for the windows.

Another of the factories to be forehanded with its 1908 product is the Aerocar plant at Detroit, which has had one of its 1908 model runabouts on the road for the past month or so. This car was sent to New York and immediately found a buyer; so great, in fact, has the demand for Aerocars become, that the enlargement of the factory would not await leisurely plans, but had of necessity to be rushed.

In a letter dated May 28 at Genoa, Georges Dunoy, who is outlining the

route of the Gold Cup Tour is very enthusiastic in praise of his Stearns car, dwelling particularly on the ease with which it took the worst of the grades in France, Belgium and Italy. He has been so pleased with its ability that he has taken every opportunity to show automobile agents in the various towns he has stopped at just what the car can do.

In a Thomas Speedway Flyer—a duplicate of the car recently purchased by W. K. Vanderbilt, Jr., E. C. Richard and George M. Davis left Buffalo last week with the intention of going round the Glidden Tour circuit in six to seven days. Their primary object is to make a careful inspection of the roads, and on their return a report will be made of the surfacing of the different roads.

E. Linn Mathewson's successful attempt on the 50-mile track record at Denver, when he reduced it to 55:43 4-5, is the culmination of a long line of struggles to lower this mark by drivers of Thomas cars, A. Stanley Zell, of Baltimore, starting it at 1:06:36, Ollie Savin bringing it to 1:06:19 at Chicago, which stood until Ernest Kelly took off a good three minutes at Philadelphia, which left it at 1:03:19¾, all the trials being made in Thomas Flyers.

The Bellefield Motor Company has been formed by J. H. McClaren, George D. Kelley and Frank P. Blackmore. Mr. McClaren is well known in Pittsburg automobile circles, having been the originator of the auto bus line which operated in and around the city for over a year. He is interested in several important automobile inventions and with his associates will engage in a manufacturing business in Pittsburg.

In reports from Europe of touring arrivals at prominent points reached by tourists, the number of American cars is noticeably on the increase. The George N. Pierce Company of Buffalo has decided to extend its system of cars by the establishment in Paris, France, of a department for the supplying of parts, and Mr. N. S. Goodsill, 11 Rue Scribe, Paris, will look after this department. This radical departure will aid Pierce tourists materially.

In securing the Seventh Regiment armory at Chicago for the exhibit of commercial cars during the next Chicago show, Manager Samuel A. Miles has added 30,000 square feet of exhibiting space. Although the commercial vehicle exhibit will be run coincident with Chicago's eighth annual show, it will be known as the first annual exhibition of commercial cars, for the purpose of establishing its identity as a distinct feature of the industry.

On the same day that the New York Motor Club was holding its gruelling endurance run up the state, with Berliet cars doing press duty, another of the American Locomotive Company's products was being put to an equally severe test. This was James Rascover's Berliet, which he drove over Storm King mountain, opposite West Point, with six passengers besides the driver. The roads could not have been worse, but the car did admirably despite its heavy load.

As a result of the great amount of work that has been devoted to it, the

information bureau of the American Automobile Association is replete with data concerning routes for tours in this country, while a membership in the organization is even more valuable to those autoists who contemplate touring abroad. The A. A. A. credentials not only serve as an introduction at the clubs in Great Britain and on the Continent, but also enable one to obtain information concerning foreign routes.

When last heard from, Frank Miller, president of the Bridgeport Automobile Club, was still grinding out miles in his 24-horsepower Premier touring car in the attempt to break the non-stop road record, which he tackled on June 3. He has been jogging back and forth between Bridgeport and New York, averaging a little better than 200 miles a day despite the rough and muddy roads, a little variety being had by taking side trips into the hills, besides going round a circuit over the rolling country back of Bridgeport. In eight days' running Mr. Miller had covered 1,877 miles.

The Dragon Automobile Company, of Philadelphia, has been building some high-powered motors in addition to those designed for its Vanderbilt cup cars, and two of them have been purchased by E. O. Spillman the engine builder, of North Tonawanda, N. Y., who intends to install them in a 12-meter launch now building. The motors are to be coupled tandem and will develop 250 horsepower. The new boat will be named the *Dragon* and is a copy of *Niagara III* so far as the hull is concerned. The latter cleaned up everything on the lakes last year, so that the performance of her new rival will be watched with interest.

RECENT BUSINESS CHANGES.

Apperson Bros.' Automobile Company has removed its salesroom and office from Fifty-second street and Broadway to Fifty-fourth street, just west of Broadway.

H. A. Heinel Company's gasoline engine manufacturers, Wilmington, Del., has sold its business to Jones & Schumacher of that city. For the present the new firm is located at 1100A West street.

Charles R. Johnson, former manager of the Buick-Johnson Automobile Company Grand Rapids, Mich., has sold his interest to George Waller, who has taken the active management. Mr. Johnson will engage in the lumber trade in northern Wisconsin.

The Rambler Garage Company has succeeded the C. G. Norton Company at Milwaukee, Wis., as representative of Thos. B. Jeffery & Company in that city. The present quarters on Broadway will be enlarged by the addition of another story. The officers of the new company are: Charles T. Jeffery, president; Harold W. Jeffery, vice-president and treasurer; O. C. Hutchinson, secretary; A. W. Shattuck, resident manager.

J. E. Demar, the well-known importer of English Daimler cars, has resigned his connection with that vehicle and organized the J. E. Demar Company for

the manufacture of automobile specialties, with a factory occupying over 8,000 square feet at 244 to 250 West Forty-ninth street, New York. The new company will make tops, slip covers, etc., and has been appointed sole metropolitan selling agents for the Crescent detachable rim.

Announcement was made last week that the Willyoung Appliance Company of Yonkers had absorbed the business of the G. J. Schultz Company, makers of Diamond spark plugs. These plugs have been successfully marketed for a number of years and are credited with the biggest order ever given in the spark plug line, being fitted in all Ford runabouts. Elmer G. Willvoug, president of the Willyoung Appliance Company, says the factory is now exceptionally busy.

NEW AGENCIES ESTABLISHED.

Ralph Hamlin, Los Angeles, Cal., has taken the agency for the Lozier in that territory.

The Hartford Auto Exchange, 39 Imlay street, Hartford, Conn., has secured the agency for the Berkshire line.

New showrooms have been opened at 2128 Broadway, between Seventy-fourth and Seventy-fifth streets, by the Auto Improvement Company, of 316 Hudson street, manufacturers of the "Ever Ready" speedometers, tire tools, vulcanizers, etc.

Sales Manager George K. Wheeler of the Columbus Buggy Company, Columbus, O., has established a very important agency for the Columbus Electrics with the Autocar Sales Company, Broadway and Eightieth streets, New York City. The new agents are well fitted for the work, Manager John Milliken having had ten years of electric vehicle experience.

W. D. Newerf, Pacific Coast representative of the Goodyear Rubber Company, with headquarters at Los Angeles, Cal., will establish a branch house in San Francisco on Golden Gate avenue. A. C. Leonard, of Los Angeles, will have charge of the new branch. The Oregon Motor Car Company of Portland has taken the Goodyear agency for that territory and A. G. Emmons, at Fresno, Cal., will handle that portion of the State.

The Winton Motor Carriage Company has established its own branch house in Seattle Wash., at 715 East Pine street, where commodious quarters have been secured. Winton interests in the Northwest have been growing so rapidly as to demand closer attention than could be given otherwise than through a branch house. George W. Miller, formerly manager of the Broadway Automobile Company, of Seattle, is in charge. The Winton Company now has nine branch houses in this country and London.

PERSONAL TRADE MENTION.

Leon M. Bradley of Boston, well known in automobile journalistic circles, will hereafter be identified with the American Motor Car Manufacturers' Association.

L. I. Ollier, who has been manager for the Chicago branch of R. M. Owen & Company, has resigned and gone to Los Angeles, Cal., where he will open a manufacturers' agency.

C. A. Benjamin, vice-president and general manager of the Aerocar Company of Detroit, has been spending a week in the Eastern cities, visiting the principal Aerocar agencies.

A. F. Eckstein, who has been connected with the Thomas B. Jeffery Company at Kenosha, Wis., has joined the forces of the Milwaukee Motor Supply Company, Milwaukee, Wis.

President E. H. Parkhurst of the Peerless Motor Car Company, who has been on an Eastern trip to New York and other business centers, has returned to the factory at Cleveland.

Fay L. Faurote, the well-known publicity manager of the Olds Motor Works, Lansing, Mich., was married Wednesday, June 12, at St. Louis to Miss Emily Ethel Bacon, daughter of Mr. and Mrs. Frederick H. Bacon of that city. The honeymoon is now being enjoyed by the happy pair by a trip via automobile through the Eastern States.

GOOD SALESMEN DESIRED.

The Michelin Tire Company, whose factory at Milltown, N. J., is being prepared for a big output for the coming season, is organizing its sales department and it is reported has a few vacancies for good men.

BOWSER ASKS INJUNCTION.

Charging unfair methods of competition, suit has been filed in the United States district court at Cincinnati by S. F. Bowser & Co. against the National Oil Pump and Tank Company, of Dayton. The action is supplementary to a suit for infringement of patent which the Fort Wayne firm filed against the Dayton concern some months ago. The argument on the preliminary injunction asked for by plaintiff will be heard on June 28.

ANOTHER ROBERTS PATENT.

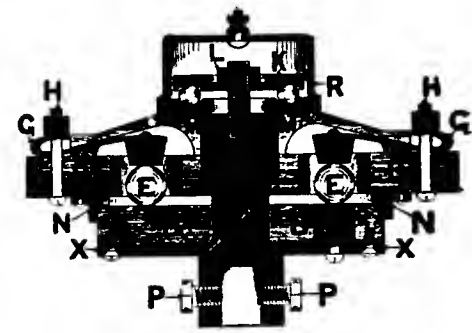
Letters patent No. 854,709 have just been granted to Joseph Abrahamson, of the Robert Instrument Company, 50 Shelby street, Detroit, Mich., covering improvements in electrical measuring instruments, and specifically in the small pocket volt and ammeters for battery-testing purposes, with the manufacture of which this company has long been identified. The exterior and interior of the instrument broadly covered by the patent are shown in the accompanying illustrations, while the principal points of the invention protected by the patent are included in Claim I of the latter, which reads as follows:

"I—In an electrical measuring instrument, the combination with the casing, its slotted dial and scale thereon, of a coil in the casing forming part of a conductor adapted to convey the current to be measured through the coil, said coil being flattened on opposite sides and formed of a ribbon like conductor of large capacity the individual turns of which are separated by air spaces, a shaft pivoted in the flattened sides of the coil, an armature and a balanced index hand upon the shaft and a permanent magnet secured upon the coil and co-operating with the armature."

INFORMATION FOR AUTO USERS.

Darmac Commutators.—No system of ignition is stronger than its weakest part, say the makers of the Darmac ball-

bearing contact timers, the Darmac Commutator Company, 220-222 East Fifth street, St. Paul, Minn., and the otherwise perfect system is made worthless by the non-dependable timer. To obtain a full spark of exact duration, at the same relative time in each cylinder, and to have the timing under exact control means the maximum power for the



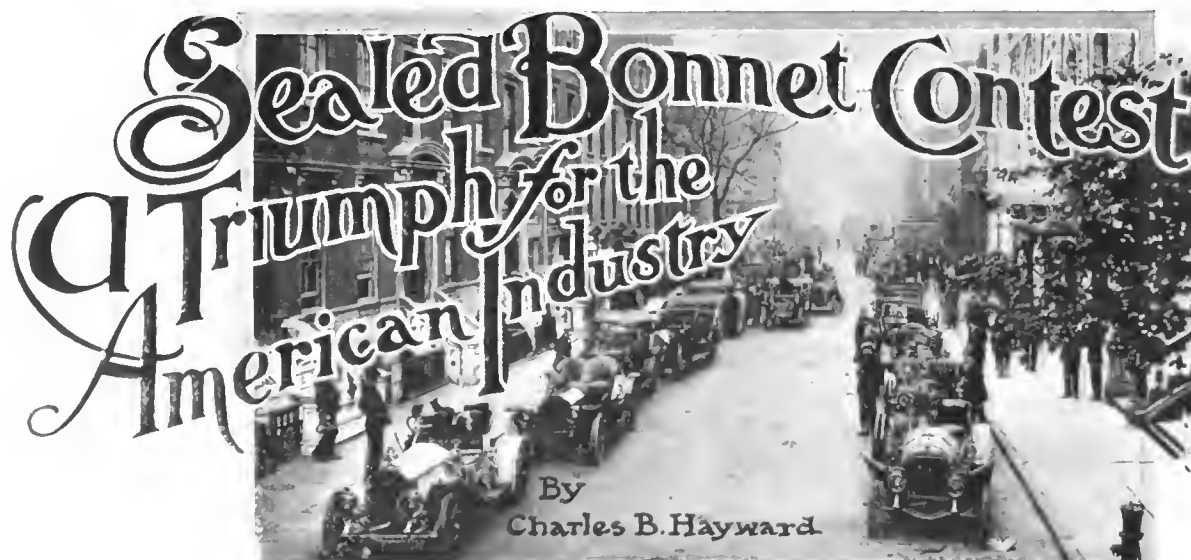
SECTIONAL VIEW DARMAC COMMUTATOR.

motor. This is accomplished by the Darmac timer or distributor because it will not miss a contact at any speed and it cannot vary its timing, all points being rigid as to position and the ball-bearing contact—reduces friction to a minimum. It is built entirely of tool steel and special friction fiber, with special provision to prevent disalignment, so that it will wear indefinitely, the slight embedding of the ball points in the fiber disc as the result of service only tending to increase its efficiency, as a greater section of the ball face then comes in contact with the segment. In other words, like the classic socks, "the longer they wear the better they get." The accompanying illustration, showing a timer in section, is practically self-explanatory. D represents the stationary fiber disc; A the spindle; B the revolving fiber block carrying the tool-steel contact; C F the contacts, and B the balls. The timers are made for all types of motors, from single to six-cylinder, and both plain and with distributors.

A New Tire Saver.—The makers of the Hercules leather tires, the Republican Tire & Shoe Company, 449 West 53d street, New York, have just inaugurated a new process for retreading old and worn tires and by which the old shoes may be ready for service again by the addition of one-piece red or white treads in the course of 24 hours. These treads are quite thick in the center, tapering at the edges, and are claimed to wear much better than the ordinary repair, at half the price. Each tread is fully guaranteed, and both the rubber and leather non-skid treads are covered by patents. Their low first cost and great durability are strong recommendations.

Crescent Removable Rims.—Hot weather and the job of changing a huge shoe on a dusty road in order to mend a puncture, form a combination that the average would rather sidestep every time and how much more the amateur? The removable rim has proven its worth in racing, but has been somewhat slower in achieving recognition at the hands of the tourist. The Crescent rim, formerly known as the Harburg, made by the Crescent Parts Company, of New York City, has a record of 3 minutes for a complete change and is receiving deserved recognition at the hands of the trade.

THE AUTOMOBILE



IF some enterprising jewelry house had sent a salesman to the Contest Committee of the Automobile Club of America any time after last Thursday night there is little doubt but what he would have been given the glad hand, to put it in the vernacular. Wednesday had been a clean-score day for every one of the forty-seven contestants in the club's sealed bonnet contest and Thursday had destroyed the chances of so very few that it looked as if the club would have to go into the wholesale jewelry business in order to supply the demand for the promised cups, but Chairman Morrell said that the prizes would be forthcoming even if it were necessary to put a second mortgage on the clubhouse.

Of the forty-eight entrants but one failed to start, Percy Owen's Bianchi, which was to have been driven by G. Combet; unfortunately, the car had been sold and the purchaser wished immediate delivery, otherwise there would have been a full field. The arrangements were perfect and all the cars were sent away

promptly within a few minutes after 8 A. M. Wednesday, and they were as promptly dispatched by the official starter at Newtown. True to tradition, the run started off as a race and, with the exception of a few of the more conservative drivers who outlined the schedule right from the start and stuck to it consistently, it was a case of get there as fast as you can and the devil take the hindmost, which meant a diet of dust for the whole seventy-five miles. There was quite a different story to tell on the way back, for those who had made up time in the morning had to lose it in the afternoon or be penalized for arriving too early. I rode in the De Luxe and we had things figured down so fine that even the photographer's time was recorded.

This practically tells the story of the first day's run; the cars dawdled so on the last lap of the run that they weren't going fast enough to kick up any dust. It made the farmers take notice to see automobiles going so slowly, and other drivers along the



STARTER WAGNER DISPATCHING THE CARS FROM NEWTOWN FOR PATCHOGUE THE FIRST DAY.



TYPICAL DAILY SCENE AT THE STARTING LINE.



ROLLING ALONG AN OILED STRETCH OF THE PIKE.



A SOUTH ROAD SCENE—W. K. VANDERBILT, JR.'S, ESTATE.



THE LINE UP FOR DINNER AT PATCHOGUE, LONG ISLAND.



SENDING THE CARS AWAY FROM CENTRAL BRIDGE, NEW YORK.

road were at a loss to make out what kind of a slow race the contest might be. At the end of the first day's run it looked as if the club was in for cups pretty heavily, for the only contestant who failed to report early was S. B. Stevens with his 20-horsepower Darracq runabout, and as tire troubles were his only misfortune he was not disqualified. The first day's run was only a sort of introduction, the route for the second installment of 150 miles having been selected more with a view to trying the powers of the cars, as there is a choice collection of hills between here and Danbury, Conn., by way of Kensico, Bedford and the other towns on that line. But the cars simply ate them up alive, to impress the Coney Island barker's yell; the 45-horsepower Pierce with J. S. Williams at the wheel, in which I rode the second day, making light of even the worst ones on the high, and that in spite of the fact that they are such twisters as to give little opportunity of rushing them. Despite the severe nature of the second day's run the result at the end of 300 miles must certainly have been a large surprise for the committee, the Columbia 45-horsepower gasoline-electric touring car, driven by C. F. Barrett, being retired with a broken valve spring. B. F. Dawson's Stoddard-Dayton runabout, driven by R. Howard, also lost its number through the necessity of putting a nut on the steering gear, which as a matter of fact had simply been overlooked and should have been there before the car started out.

It looked for a time as if others would fall by the wayside, through no fault of their own, however. Considerable pains had been taken in studying the route, and men with green flags were posted wherever there was any opportunity of being trapped by the over-zealous constable. But those at Newcastle Corners thought they ought to have some of the money in spite of this, and they roped in three cars willy-nilly. These were the Maxwell and Mora touring cars, driven by F. Offenhauser and W. Stiekney, respectively, and the Mora runabout, with F. Cimiotti at the wheel. There was a warm pow-wow, and Stiekney took advantage of the opportunity to let in his elutch and slide off, much to the chagrin of the upholders of the law. The J. P., right at hand, said "ten dollars" in the case of the other two, but Mr. Cimiotti protested so strenuously, backing up his argument by the observer's time book, that the heart of the court was softened and remitted the ten. The Maxwell driver was not so fortunate and had to pay under protest. Recognizing the circumstances the committee let it be known that these cars would not be disqualified under the rules to that effect. This left forty-five of the original forty-seven still in the running on Thursday night though the Pope-Toledo, driven by Joe Judge, was protested owing to having used pliers on its accelerator pedal. Thursday was a bad day for the Glide, driven by J. C. McCafferty, who not only had tire troubles, but also broke a detachable rim about twenty miles this side of Danbury and lost two hours while waiting for a new one, in spite of which he turned up on schedule time.

Friday was another easy day for practically all the cars and made the committee open its eyes a little wider, as the 150-mile run which brought the total to 450 miles only served to eliminate one competitor through a most trivial defect. This was the De Luxe touring car, driven by C. S. Beach; when only fifteen miles out a primary short-circuit ended the car's chances, though it continued and even served the next day without mishap as a press car, completing its services by towing in the Welch. The third day's run was along the shore road to Westhaven, just outside of New Haven, the running time being taken from Central Bridge. The first car to report at the clubhouse Friday night was the Locomobile, driven by J. Florida, carrying the number 9-B, which by that time had become quite familiar to all contestants, as the driver with the state name was always met well on his way back long before the end of the line had reached the turning point. How closely the cars simulated clockwork in their movements is evident from the way they reported at this, the end of the third day's run, completing 450 miles. Florida's Locomobile reported at 4:48, followed by W. Folberth's Oldsmobile at 4:59, with the Stoddard-Dayton tour-



TRIUMPHANT RETURN OF THIRD DAY'S RUN.



LUNCH ACCOMMODATIONS.



A STOP ON SHORE-ROAD, THIRD DAY'S RUN.

ing car one minute later; then came another Locomobile with T. Beck at the wheel. After that they came too fast to count, and all except the Glide, which had again been held up by tire trouble, came in as close to the schedule as if they had been limited railroad trains.

This left forty-three cars running as well as ever to compete against the chance of some minor ailment under their bonnets on the last 150 miles of the 600. The Glide accounted for the missing one, having been compelled to raise its bonnet to make repairs to a broken wire. It was hardly thought possible that the Long Island run would serve to cut the list down any. I took this day's run in the big Matheson, handled by Frank Lescault. The Matheson went like clock-work and Lescault kept the speedometer hand glued to the 18-mile mark, except when it was necessary to accelerate a bit to get over a rise on the high or when he got tired of taking all the dust of the man ahead. Beach, who drove the De Luxe, Williams, of the Pierce forces, and Lescault in the Matheson were models of propriety in driving; certainly not even the most zealous upholder of an arbitrary speed limit could find any fault with their traveling, though we were held up in the big Pierce on Friday by one of the city's bicycle cops on the Pelham parkway.

He graciously let us off, however, on the ground that the Pierce was carrying a 14-A; if it had been 13 it would have been all off.

On the way back the story was about the same. The others figured out their times to a dot, so as to bring them in within a minute or two of the minimum. And each one started off on his own hook when it best suited his convenience, so that it was seldom that more than one or two cars were to be seen together at any point along the road. We were one

of the exceptions, the Deere runabout, driven by A. F. Camacho, having broken its speedometer gear and sticking to us as a pilot, as the finishing times of the two cars were but two minutes apart. The performance of the Deere runabout was considerable of a surprise, as it was known to be an old car that had been given no special overhauling preparatory to entering the run. The Welch was also an old car, and the fact that it lasted to within a few miles of the finish of the last day's run was little short of a marvel. It finally came to grief on Roslyn Hill, when three-fourths of the way up, and it is an open question whether it was really the driver's fault and whether the car would really have been able to cross the finish line a winner had a little more foresight been exercised in providing for replenishing the oil supply of the gear case. As it was, its performance was certainly most creditable, and no one who saw it the first day so much as counted it in the running at all where finishing was concerned. Beach in the De Luxe played the good Samaritan and handed out a tow line.

The only other competitor to fall by the wayside on this, the last day of the run, was S. B. Stevens in his 20-horsepower Darracq runabout, which came to grief with a broken camshaft, thus making the average number of eliminations one and a fraction per day for the four days of the run, while the sum total of the troubles encountered was almost a negligible quantity, omitting one or two exceptions. This left forty-one cars to roll home promptly within the eight-hour schedule and forty-one of those expensive cups for the Automobile Club of America to purchase and have suitably engraved with the record of this most consistent of endurance tests that has ever been held.



SECRETARY BUTLER—A WORKER.



SOME GOOD GOING ON THE SECOND INSTALLMENT.



ROUND-UP OF THE HUNGRY ONES AT MAPLEWOOD.



MORRELL AND RIKER, TWO LEADERS OF THE COMMITTEE.



A. L. WESTGARD AND THE OFFICIAL POPE-HARTFORD.

ROLL OF HONOR IN THE A. C. A.'S SEALED BONNET CONTEST.

Official No.	CLASS	TYPE OF CAR	MAKE OF CAR	SELLING PRICE	DRIVER	ENTERED BY
1	A	40 h.p. Touring	Berliet	\$7,500	P. J. Johnson	Amer. Loco. Auto. Co.
2	B	30-35 h.p. "	Stoddard-Dayton	2,500	E. C. J. McShane	Atlantic Motor Car Co.
5	A	40 h.p. "	Lozler	5,000	H. Michener	H. A. & J. T. Lozler
6	A	40 h.p. "	"	5,000	R. Mulford	"
7	B	35 h.p. "	Elmore	2,660	A. M. Day	Arthur M. Day
8	A	30-35 h.p. "	Locomobile	4,500	H. Mitchell	Loco. Co. of Amer.
9	B	15-20 h.p. "	"	2,800	J. Florida	"
10	A	40 h.p. "	"	3,000	A. J. Bants	"
11	A	15-20 h.p. "	"	3,000	T. Beck	"
12	A	60 h.p. "	Thomas Flyer	4,000	M. Roberts	Harry S. Houpt
14	A	45 h.p. "	Pierce-Arrow	5,000	J. S. Williams	Harrolds Motor Car Co.
15	B	40 h.p. "	Aerocar	2,750	A. M. Robbins	Aerocar Co.
16	A	45 h.p. "	Royal Tourist	4,000	R. Tucker	Royal Motor Car Co.
17	B	40 h.p. Runabout	Continental	2,700	C. S. Johnston	Continental Auto. Mfg. Co.
19	B	25-30 h.p. Touring	Pope-Hartford	2,750	P. Hines	A. G. Southworth Co.
20	A	50 h.p. "	Pope-Toledo	4,250	Joe Judge	"
21	B	35-40 h.p. Runabout	Oldsmobile	2,750	W. Folberth	Olds Motor Works
22	B	30 h.p. Touring	Knox	2,500	A. E. Dennison	Knox Automobile Co.
23	B	30 h.p. Runabout	"	2,500	W. A. Bourque	"
25	A	40 h.p. Touring	Berliet	7,500	H. C. Townsend	Amer. Loco. Auto Co.
26	A	30 h.p. "	White	3,500	W. C. White	Walter C. White
27	A	30 h.p. "	"	3,700	H. K. Sheridan	Rollin H. White
28	B	30-35 h.p. Runabout	Stoddard-Dayton	2,750	R. Howard	B. F. Dawson
29	B	24 h.p. "	Corbin	2,400	J. Corbett	Corbin Motor Vc. Cor.
30	B	24 h.p. Touring	"	2,500	H. Trecker	"
31	B	24 h.p. "	"	2,500	A. Bailey	"
32	B	24 h.p. Runabout	Racytype	2,500	W. H. Birdsall	Mora Motor Car Co.
33	A	30-35 h.p. Touring	Studebaker	4,000	J. A. Holm	Studebaker Bros. Co.
34	A	30 h.p. "	Amer. Mors	5,000	N. M. Varney	St. Louis Car Co.
35	A	50 h.p. "	"	6,000	L. Potter	"
36	B	24-32 h.p. "	Matheson	4,500	F. Lescault	Matheson Co. of N. Y.
37	B	30 h.p. "	Haynes	2,500	C. B. Warren	C. B. Warren
38	A	50 h.p. "	Darracq	9,500	E. Griffith	Darracq Motor Car Co.
39	B	24 h.p. Runabout	Mora	2,300	F. Cimlott	Cimlott Bros.
40	B	24 h.p. Touring	"	2,200	Mr. Stickney	"
41	C	24 h.p. Runabout	Jackson	1,500	H. H. Cole	H. H. Cole
42	B	40 h.p. "	Deere	2,000	A. F. Camacho	Zim-Rock Motor Car Co.
43	A	40 h.p. "	Matheson	5,000	R. G. Kelsey	R. G. Kelsey
44	A	40-50 h.p. Touring	Rolls-Royce	8,250	L. R. Burne	Walter C. Martin
47	C	12-14 h.p. Runabout	Maxwell	850	Charles Fleming	Maxwell-Mriscoe Motor Co.
48	C	16-20 h.p. Touring	"	1,450	F. Offenhauser	"

THOSE THAT FELL BY THE WAYSIDE AND THEIR TROUBLES.

3	B	30-35 h.p. Runabout	Stoddard-Dayton	\$2,500	R. Newton	Placing nut on steering gear
4	B	36 h.p. Touring	Glide	2,500	J. McCafferty	Broken battery wire
18	A	45 h.p. "	Columbia	7,500	C. F. Barrett	Broken valve spring
24	A	50-60 h.p. "	De Luxe	4,750	C. S. Beach	Primary short-circuit
45	A	50 h.p. "	Weich	4,250	E. L. DeCamp	No oil in gear case
46	A	15-20 h.p. Runabout	Darracq	4,500	S. B. Stevens	Broken camshaft



BRIDGEPORT, WHERE MANY STOPPED FOR LUNCH THE THIRD DAY.



WEST HAVEN, THE TURNING POINT OF THE THIRD DAY'S RUN.

ITALY ALL-VICTORIOUS IN GERMAN RACE

HOMBURG, GERMANY, June 16.—Thursday, under a drizzling rain which transformed the serpentine mountain course into a nerve-racking track, two series of races were run off to decide the starters for the trophy offered by the German Emperor. On the first round there were thirty-nine starters, and on the second thirty-eight, the first twenty of each qualifying for the final. Germany, the most strongly represented, had fourteen cars qualified and nineteen eliminated; France had eight in and eight out; Italy qualified with nine and lost four; Belgium's proportion was six and two; England retained one car and lost two; Austria lost both her representatives, and Switzerland retained the only two Martinis she had entered. The feature of the day was the victory of the Fiat team, the position of the day's result being Nazzaro, Lancia, Wagner, first, second and third, only 6 minutes 35 seconds separating Wagner from his companion, Nazzaro.

At a very early stage the contest settled down to a struggle between Italy, Belgium and Germany. France, with her eight cars, was not a formidable competitor; Darracq had the disad-

had been well sustained, increased to high tension. Lancia, who since his slow first round had been going faster and faster, was first to finish, covering the fourth round in the record-breaking time of 1:21:52, equal to 54.1 miles an hour. Wild bursts, however, will not win modern automobile races, and Lancia had to go down six degrees in the general classification. Deplus, the dangerous Pipe driver, had to abandon on the last round, when second or third position seemed certain, as the result of an accident to steering gear. A tire burst on Hautvast's Pipe when near the end of the race. His Continental-Vinet dismountables soon provided a substitute, and the most remarkable run of the day was finished in good form, the difference between Hautvast's fastest and slowest round being but 2 minutes 22 seconds.

Hardly had the Belgian reached the grand stand than Nazzaro went by with a roar and snatched a glorious victory from his rival by a margin of less than five minutes. As he got out of his seat Nazzaro, with a broad smile over his countenance, declared: "I was never so hard pressed in my life. It was a fine race.



FOURNIER, WHO HAS RETURNED TO RACING.

HAUTVAST, THE TERRIBLE BELGIAN.

SCENE AT ONE OF THE TIRE STATIONS.

vantage of being in the hands of amateur drivers; Lorraine-Dietrich, from whom much was expected, developed a number of minor troubles, and the others were lacking in speed. England was entirely out of the game.

Fritz Opel, who started second on an Opel machine, finished first in a wild rush, followed by Hemery, now in the employ of Benz, of Germany. Lancia, who according to his starting position should have finished early, was slow in coming round, occupying 1:40 to cover the course, compared with 1:23:50, the record established by Nazzaro, and thus losing all chance of capturing the cup. Duray and his Dietrich abandoned on the initial round; Vincenzo Florio withdrew his Darracq with a cracked cylinder; Wilhelm was killed through his Metallurgique overturning at the foot of a descent, and Willy Poegge, with the bad luck which followed him in the Herkomer tour, had to retire with his Mercedes after a dangerous fire at the carbureter.

By the third round the race had settled down to a keen struggle between the Fiat and the Pipe teams, representing Italy and Belgium, with Opel hanging dangerously near. At the end of the second round Hautvast and Deplus, both on Pipe machines, had got a lead on Nazzaro and were running with such remarkable regularity that, barring accidents, victory seemed assured. Hautvast, who had started out with 1:24:14 for the first round, gained 12 seconds on his second round and lost 9 seconds on the third. It was this loss of time on the third round which gave Nazzaro a chance to get ahead. His position, however, was by no means secure, for the terrible Belgian was only 33 seconds behind and his comrade, Deplus, was in a good position and going well.

When the fourth and last round commenced excitement, which

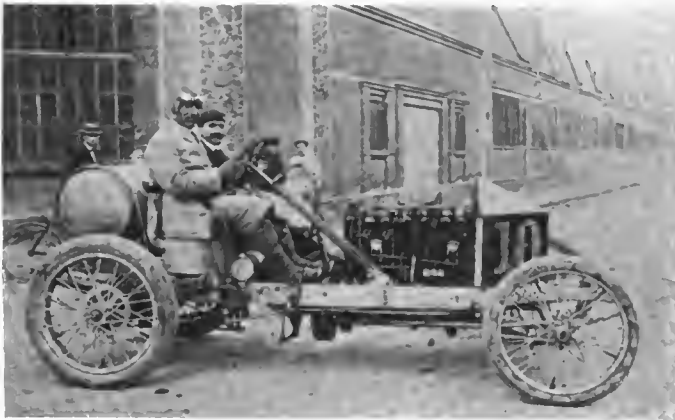
My machine went splendidly, but Hautvast is a terrible driver."

Joerns, on an Opel, who since the end of the first round had been in third place, finished in that position, with his companion, Michel, fourth at an interval of ten minutes. Wagner, who on the second round had lost ten minutes, went faster as he neared the end of the race, finishing fifth, less than two minutes ahead of Lancia. Henry Fournier, riding after an absence of several years from the race track, achieved a notable victory for his Italas from Italy by capturing eighth position. Cagno and Fabry, his team mates, also finished the race, thus sharing with Fiat the honor of being the only team of three to stand the terrible strain.

Emperor William, who from start to finish had not missed the smallest detail of the race, clad in his gorgeous uniform, with fitting royal dignity, presented the cup to Nazzaro and heartily congratulated him on his success.

Classified Results of the Emperor's Cup Race.

1.	Fiat (Italy), Nazzaro.....	5:34:26
2.	Pipe (Belgium), Hautvast.....	5:39:10
3.	Opel (Germany), Joerns.....	5:39:49
4.	Opel (Germany), Michel.....	5:49:35
5.	Fiat (Italy), Wagner.....	5:50:53
6.	Fiat (Italy), Lancia.....	5:51:11
7.	Isotta-Fraschini (Italy), Minoia.....	5:51:15
8.	Itala (Italy), Fournier.....	5:53:18
9.	Mercedes (Germany), Salzer.....	5:57:33
10.	Itala (Italy), Cagno.....	5:59:12
11.	Eisenach (Germany), Schmidt.....	6:03:31
12.	Martini (Switzerland), Buetler.....	6:05:11
13.	Dietrich (France), Rougier.....	6:08:15
14.	Mercedes (Germany), Jenatton.....	6:08:54
15.	Martini (Switzerland), Beck.....	6:21:14
16.	Itala (Italy), Fabry.....	6:29:01
17.	Bianchi (Italy), Tommaselli.....	6:31:45
18.	N. A. G. (Germany), Scholz.....	6:35:23
19.	Durkopp (Germany), Schmidt.....	6:46:45
20.	Protos (Germany), Adelberger.....	7:13:08



NEW DARRACQ RACER RESEMBLES VANDERBILT VICTOR.

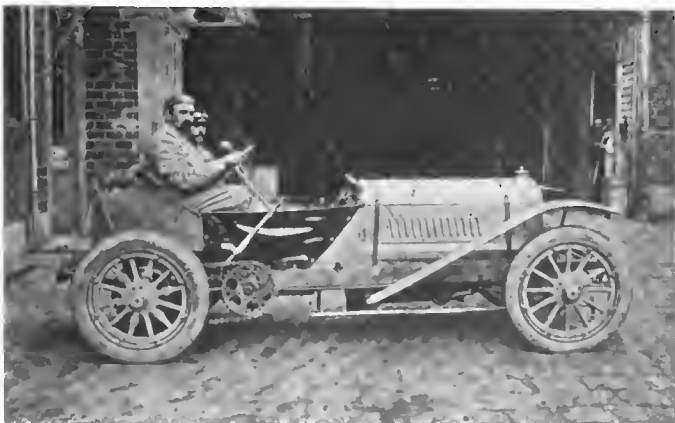
CANDIDATES FOR GRAND PRIX.

Tuesday next, July 2, on a triangular circuit near Dieppe, the Automobile Club of France will conduct a speed contest which by reason of the fast course selected, the power of the machines and the elaborate nature of the organization, will be the most important of all the races ever held in Europe or elsewhere. Additional interest attaches to the Grand Prix by reason of the application for the first time of a limited fuel supply as the only power-restrictive measure.

Contrary to what might be expected, there are no radical differences between the leading machines of Grand Prix 1906 under the thousand kilos weight limit and Grand Prix 1907 with no other restriction than an engine which does not consume more than a gallon of gasoline per 9.4 miles.

Renault, victorious last year, presents three machines which might at first glance be mistaken for those which Szisz, Edmond and Richez handled on the Sarthe circuit. They are a few inches shorter, are slightly narrower and have profited by the minor carbureter, magneto and radiator changes of touring models.

Brasier, who last year had the honor of being the only French maker to finish with a complete team, has also stuck to well-tried models. Same motor, same wheel base and same track. The radiator is set still further back, being now distinctly rear of the front axle, thus bringing the weight nearer to the hack wheels and assuring the best utilization of the tractive effort. Final drive is by side chain on two and by cardan shaft on one machine, compared with all three chain-driven racers last year. Henri Brasier has probably made more comparative tests with chain and shaft drive than any man living. The tank, tire brackets and seats are as close up to the rear axle as possible, the seats indeed being formed into the tank. A feature of the tire carrying equipment is a strong metal pan large enough to hold three inflated tires. Changes have been made in the carbureter on account of the new racing conditions.



SEATS AND RADIATOR POSITION DISTINGUISH BRASIER.

Darracq is another French constructor who has adhered to last year's types, the racers being practically the same machines as were seen on the Sarthe circuit and in the Vanderbilt Cup contest. Engineer Ribeyrolles has made a change in the clutch, by substituting bronze for leather. The bronze is riveted on the aluminum of the male cone exactly as if it were leather, then turned and ground to fit the female cone. A few grooves are provided in order to allow foreign matter to escape. At the start the clutch will probably slip a little, but will soon give a perfect hold. An advantage is a much smaller diameter. Panhard, on the other hand, has made a complete change, not only in general appearance but in structural detail, as has already been described in earlier numbers of *THE AUTOMOBILE*.

Lorraine-Dietrich racers are shorter in wheel base and are rather narrower, have chain drive, as last year, and have had the engine stroke increased from 160 to 170 millimeters.

Motobloc and Corre, two French firms having had little or no previous experience in road racing, present three and one flyers respectively. The feature of Motobloc is that the motor, clutch and gears are united on one crankcase, forming a single unit or block, hence the name. The four cylinders are cast in pairs, and have 165 mm. bore by 140 mm. stroke. The flywheel is carried between the two groups of cylinders.

Corre, after building small runabouts ever since automobiles were known, experiments with a powerful racer this year. It



CORRE, WHICH WILL MAKE ITS DEBUT ON JULY 2.

has a four-cylinder engine, 6 by 6 inches bore and stroke, developing 90 horsepower. Leather cone clutch, three speeds and reverse through sliding gear, with final drive through bevel gears and rear live axle are its transmission features.

With the exception of the Porthos, to be driven by Striker, a naturalized American, all French machines have four cylinders, there being a strong feeling among native constructors that a multiplicity of cylinders does not tend to fuel economy. The Porthos Grand Prix has eight cylinders cast in pairs and placed tandem fashion, dimensions being 4.3 by 4.7 bore and stroke. The machine has cardan drive, four speeds, 106-inch wheelbase, and is estimated to weigh 2,090 pounds. The only six-cylinder representative is an Aquita-Italiana from Italy.

Among the foreigners there are two eight-cylinder engines, one from the Weigel factory in England, and the Marchand, built by the Dufaux Brothers of Geneva. Here again the cylinders are in pairs, 4.9 bore by 5.9 inches stroke. Chain drive is employed.

Of the thirty-eight machines entered in the race none are attracting so much attention as the three Fiats, to be driven by Nazzaro, Wagner and Lancia. Last year's racers have been conserved and have undergone a careful tuning up and some modifications of the carbureter, about which little is known outside the factory. Cylinder dimensions are 180 by 160 bore and stroke, giving a volume only exceeded by Mercedes. The three machines from the premier German factory are practically a reproduction of last year's models with the new Saurer water jacketed carbureter.



HERKOMER COMPETITORS UNDERGOING SPEED TESTS ON MILITARY GUARDED ROAD IN THE FORSTENRIED PART.

FRANKFORT, Germany, June 16.—The best automobile in Europe—according to the Professor von Herkomer definition—has been discovered in the Benz machine, from the well-known Mannheim factory, driven by Fritz Erle and owned by Herr Ladenburg. In 1905 Ladenburg won the cup, and as the victorious machine driven this year by Engineer Erle of the Benz factory is still Ladenburg's private property, he becomes the permanent possessor of the coveted German tourist trophy. Next year it will be necessary to create a new trophy, the Herkomer Cup being now sportingly deceased, but the task will not be difficult, and it is very probable that the newcomer will have a strong resemblance to the late departed.

Hans Aschoff, on a Metallurgique from Belgium, gained second position; Henri Opel, with a machine from his own factory, captured third prize, and the following in order of merit were: (4) De Lingerke, Mercedes; (5) Karl Neumaier, Benz; (6) Herr Schmierer; (7) Richard Benz, Benz. In addition to these, thirteen machines came through the contest with clean scores, all of them German except Miss Dorothy Levitt and her six-cylinder Napier—both distinctly British.

From Lindau we set out 124 strong on the fourth stage of our seven-day contest, having as accompaniments magnificent weather and heavy, greasy roads, which proved a terror to the smooth-tire men. On the run to Forstenried, over a mountainous road, there were a number of minor mishaps, if the loss of a wheel can be called a minor—but they did not prevent the drivers repairing hurriedly and taking part in the speed test. Willy Poegge, on a Mercedes, showed the fastest burst of speed, covering the 6 kilometers 900 meters, with a flying start, in 2:51:3. Veingand, also on a Mercedes, was a good second; Fitz Erle, on a Benz, came third, and Ladenburg, on a Mercedes, had fourth position. These were the results on net running time. When a classification has been made according to cylinder capacity there may be a slightly different tale to tell.

Arrangements for the speed tests in Forstenried Park were perfect and all passed off without a hitch. An excellent stretch of road, wide, straight, with a good surface, and carefully guarded by troops, allowed of the fastest going. From the standpoint of the numerous spectators there was the additional attraction of fine weather and as fair a piece of landscape as one could wish to look upon.



THE GIANTS TAKE A NOON-DAY REST AT WURZBOURG CONTROL.

Sunday at Munich was a rest day for the cars and drivers, but an exceedingly busy period for the inhabitants, who turned out in thousands to visit the exhibition ground where our automobiles were staged. Quite apart from the cup, a prize was offered for the most luxurious and well-appointed car, which, after a long search, was discovered in the Benz owned by Dr. Pfundt. Probably never before had such a large number of luxuriously appointed automobiles been gathered together, outside of a show, as was to be seen at the Munich exhibition ground, most of them being powerful touring cars with closed bodies and ample protection against sun and rain for the driver. By a comparison of notes during the day, it was possible to forecast with some accuracy the winner of the cup. E. Ladenburg appeared to have the best chance; up to this point he had a clean score, his powerful Mercedes of 140 by 150 bore and stroke starting first every morning and acting as pilot car, giving a distinct advantage.

Hill Climb Weeded Out Several Contestants.

Munich to Augsburg, the sixth stage, is a distance of but 130 miles; as, however, there was a loss of about two hours in organizing the Kesselberg hill climb, the total mileage for the day was sufficient. On the winding, difficult hill there were several accidents, in which machines only were the sufferers. Willy Poegge, a very likely winner up to this point, broke the differential of his Mercedes and had to definitely abandon. Four others were placed hors de combat on one or other of the sharp turns. Mathis, on a Fiat, appeared to be terribly fast, as was also Fitz Erle on M. Ladenburg's Benz. This, however, is but a matter of personal appreciation, all figures in connection with the event being kept by officials and not revealed until the meeting of the jury at the end of the day. It is one of the defects of the Herkomer tour that you never know with any degree of certainty

what position you occupy in the contest, all figures being guarded with as much secrecy as if they were related to matters of national defense.

How the Laggards Were Taken Care of.

Running into Augsburg on the "schluss-wagen," the English for which is "whipper-in," one has an excellent opportunity of judging the infirmities of the weaklings. The whipper-in has to close the march, leaving in the rear only those machines incapable of advancing an-



POWERFUL ELEGANT CLOSED CARS WERE NUMEROUS.



A FRENCH REPRESENTATIVE ON GOOD MOUNTAIN ROADS.

other yard. At times the duties are wearisome, as, for instance, when waiting in the dusk for a big car to fit a couple of new tires. But the rear guard service has its advantages, in that it allows a proper appreciation of the beauties of the scene, and beauty spots on the Herkomer course are never wanting.

Leaving Augsburg at 8 o'clock, with Frankfort, 210 miles away, as final destination, the 128 competitors soon experienced bad weather. Rain fell in torrents, blinding the drivers and putting the roads into a condition which called for the utmost caution to keep the cars right side up. During the day a Pope-Toledo, accompanying the tour on an alcohol experiment, but not taking part in it officially, turned over into a ditch. The occupants were thrown into the hood, all escaping with a shaking. At Wurzburg, where there was a stop for lunch, the weather suddenly changed to as satisfactory a condition as one could imagine, and under a bright sun the second half of the daily task was accomplished and Frankfort entered in triumph. While the jury calculated assiduously to discover which of the 128 survivors should be officially declared the victor, the enthusiastic Frankfurterites cheered, each and all letting loose more enthusiasm than is generally thought to exist in a Teutonic temperament. An official banquet wound up the tour in a dignified military manner; toasts to the Kaiser, the organizing Imperial Club, the victor, the thirteen spotless survivors, and the more numerous group which found black points scored against it, being carried with gusto.

In 1905 the Herkomer trophy was won by E. Ladenburg; the following year R. Stoess proved the victor, and this year Germany is again victorious in the person of Fritz Erle, driving E. Ladenburg's Benz. It is in virtue of his ownership of the winning machine that E. Ladenburg is declared the permanent possessor of the cup. Germany has been victorious all along the line, for of the twenty machines finishing the contest with clean scores

only one is of foreign origin. Benz, the victorious firm, though one of the leading German factories, is but little known outside that country. They are building a new factory at Mannheim, from which 1,000 cars per annum will be produced, and arrangements are being made to open an agency at Paris.

FRANCE AFTER UNIFORM RACE CONDITIONS.

FRANKFORT, Germany, June 17.—Taking advantage of the presence of automobilists from all parts of the world, an international conference of recognized automobile clubs is being held here. France is interested in a uniform regulation for automobile races and has, after agreement with other bodies, put forth the proposition that 1908 races should be held under the following regulations: Minimum weight, 1,100 kilograms (2,420 pounds); maximum fuel allowance, 4.4 gallons per 62.1 miles. Germany brings up nine subjects for discussion.

DE DION WANTS 33,000,000 GALLONS OF ALCOHOL

PARIS, June 12.—France has a present problem in the wine growers' agitation in the south and future difficulties in the increasing cost of gasoline. Marquis de Dion, vice-president of the A. C. F., believes that the automobile can again save France as it saved it a few years ago. In the Chamber of Deputies recently he declared that there are 40,000 automobiles in France consuming about thirty-three millions of gasoline per year. If, instead of using gasoline these 40,000 cars employed home-produced alcohol, the north would no longer be obliged to produce sugar to adulterate the wines of the south, honest wine growers would be free from competing adulterators, and the automobile would have an unlimited supply of fuel. The Marquis has asked for an extraparliamentary commission to consider the matter.



LEAVING A CHARMING BIT OF BAVARIAN SCENERY TO TACKLE THE STEEP GRADE NEAR KESSELBERG.

BALL BEARINGS FOR AUTOMOBILE CONSTRUCTION*

By HENRY HESS.

THE field of usefulness of the ball bearing is as wide as the domain of mechanical engineering, or at least that portion of it which is concerned with the support of rotating or oscillating parts. The limitation imposed on the use of the ball bearing in no sense differs from that imposed on any other element of mechanism. It must be employed in accord with the general prohibition against overloading and in conformity with its individuality. That sounds axiomatic and is self-evident enough; but self-evident as it is, it is all too frequently disregarded. Little information on ball and roller bearings can be found in the usual engineering hand and text books. Generally the subject is dismissed with a casual reference; occasionally a formula for carrying capacity is given, but this is usually wrong. Much matter is scattered through the technical press giving isolated experiences with a few bearings that happened to come within someone's observation. Insufficient information on almost every element that must be considered is undoubtedly responsible for the directly contradictory statements to be found and the generally accepted opinion that ball bearings are suitable only for relatively light loads.

This was the situation as Professor Stribeck found it, when asked to investigate the subject for the German Small Arms and Ammunition Factories of Berlin. This concern, having been induced to go into the manufacture of balls and ball bearings, very soon found itself confronted with the imperative need for a scientific basis, if the manufacture was to be removed from the domain of haphazard blind working, resulting sometimes in success and sometimes in failure, the one as much a result of pure chance as the other and neither the result of science.

With characteristic thoroughness Professor Stribeck took up the subject. He first applied the investigations of such men as Hertz, Auerbach and others, on the deformations of elastic bodies to the development of formulæ for static conditions, then by exhaustive tests, determined constants for the materials and followed with an investigation into the conditions of relative motion, and finally concluded the whole by a long and patiently conducted series of observations with actual bearings, thus not only proving the previous theoretical investigation, but also developing data for the use of the work-a-day designer and engineer. That this labor has been crowned with success is evident enough from a consideration of the uses to which ball bearings constructed along the lines laid down have been put in the last ten years; these include not only light bearings for low and high speeds, but others for carrying the 24-ton armatures of electric flywheel generators at 500 revolutions per minute, etc.

This work of Professor Stribeck's undoubtedly is a classic in its field, so that no apology is needed for annexing a full translation and so making it available to the American engineer.

Translator's Résumé of Professor Stribeck's Report.

For the statements and form of this résumé, the translator is alone responsible, but believes that it may be accepted as a correct condensation of Professor Stribeck's work.

Sliding bearings wear out by abrasion of the carrying surfaces. Ball bearings do not give out from wear and do not wear. They may be ground out by admitting grit, but that is as illegitimate a condition for ball bearings as it is for sliding bearings. The only legitimate cause for the giving out of ball bearings is the stressing of their material beyond the limit of proportionality. Lightly loaded bearings can be so designed as to eliminate this cause and so insure practical indestructibility. For heavily loaded bearings this condition is not realizable within practicable dimensions, but the proportions may be so chosen that the over stressing does not result in breakdown within the lifetime of any mechanism to which the ball bearing is applied.

A knowledge of the elastic qualities of the materials at the hardness under which they are used is imperative. It being the elastic behavior that is important with ball bearings as with all other engineering structures, tests of balls, such as are commonly made to determine ultimate rupture when pressed into a steel plate and using the depth of indentation of the plate or load at which rupture occurs as a measure of ball quality, are not only of no value, but are misleading.

The quality of balls and of ball races must be determined from their behavior under loads in the neighborhood of the elastic limit. Balls may be subjected to loads increasing as the shape of the supporting surface more nearly becomes complementary to that of the ball. A ball running between races having a flat or straight line cross section will not support as great a load as though the section were that of a curvilinear groove. Such groove naturally must never have a curvature equaling that of the ball, since that would substitute sliding for rolling contact.

The frictional resistance of a ball bearing is lower, the less the number of balls. Usually bearings can be designed to have between 10 and 20 balls. As balls are usually made to English inches it is convenient to take one-eighth of an inch as unity.

Some Prime Requirements of Ball Bearings.

Speed of rotation, in so far as it is uniform, does not affect carrying capacity. (This applies to radial bearings, but not to thrust bearings of the collar type; in these the carrying capacity decreases with increase of speed.) But speed is rarely uniform; variations cut down the carrying capacity; sharp variations of small amplitude, particularly at high speed, have the more marked effect. Their reducing action is similar to the battering effect of sharp load variations. *Load variations reduce carrying capacity, the effect increasing with the amount of the load change and the rapidity of such change.* *Accumulated experience* with various classes of mechanisms is so far the only available guide for estimating the reductions in the constants that must be made to take these influences into account.

The carrying capacity of a complete bearing is no greater than that of the weakest cross section that comes under the load. This applies to all those forms which have curved race sections of maximum sustaining capacity, except at a point where an opening is cut to permit the introduction of the balls; such bearings are, as to load carrying capacity, governed by the weaker cross-section at that point.

The calculated carrying capacity can be realized only if all balls sustain their share of the load. It is obvious enough that if a ball is smaller than those on either side of it, it will not carry its share of the load; should it be larger, it will carry more than its share and may be overloaded. Uniformity of ball diameter is essential. The permissible variation in ball diameter will be governed by the deformation produced by a relatively small part of the total bearing load, so that the balance of the load may be distributed over the several balls. Such permissible variations of ball diameters amounts to but little more than one ten-thousandth part of an inch.

High finish of both ball and ball sustaining surfaces is essential. The presence of grinding scratches will very materially cut down the cited values of the constant. Of course this presupposes true surfaces underlying the high polish. It follows from this requirement that rust and acid must be carefully avoided as they are destructive of finish and truth of shape. It may not be amiss to point out that *uniformity of quality of material, of hardness and of structure throughout are essential.* The mischief of using balls having different values is not simply confined to the individual ball; if, for instance, one ball were materially harder and so deformed less than its mates, it would take more load and might therefore overload the material of the race, which would yet be

*Extract from paper read at the Indianapolis, Ind., meeting of the American Society of Mechanical Engineers.

entirely suitable under a division of the bearing load among a larger number of balls.

The *frictional resistance of ball bearings* has, by actual measurement, been found to vary from 0.0011 to 0.0095. These are the coefficients of friction referred to the shaft diameter, thus permitting direct comparison with those of sliding friction. The higher values are due to conditions that cause a preponderance of sliding as compared with rolling friction. It must be remembered that there is no such thing as a bearing having only rolling friction; that might be possible were balls and races made originally with absolute truth of surfaces and were such truth then maintained by the absence of deformation under load. Ball bearings having a coefficient of friction materially above 0.0015 under the greatest allowable load are inadmissible because too shortlived. The high resistance indicates the presence of too large an element of sliding.

A good ball bearing will have a coefficient of friction, independent of the speed within wide limits, and approximating 0.0015. This coefficient will rise to approximately 0.0030 under a reduction of the load to about one-tenth of the maximum.

Suitable Materials for Ball Bearings.

The prohibition against overloading demands recognition of the characteristics of the bearing materials. Any material may be used that will not, under the working load, be so deformed as to prevent pure rolling. That means an absolutely inelastic material and one which unfortunately is, and more than probably will remain, undiscovered. But a slight narrowing is admissible to make the demand read: *Any material may be used that will not, under the working load, deflect enough to prevent substantial rolling.* That recognizes that all materials deform under load. Such deformation means change of shape from the original truth and that in turn will cause some sliding combined with rolling; *this sliding must be held down to the irreducible minimum.* Any material may be used that will not, under the working load, be stressed beyond its elastic limit; that is a limitation which is possible of attainment.

The tooth of time would be worn out against such a bearing. Its design is entirely practicable for light work, but for the heavier loads, the requirements would lead to, usually, impractical dimensions. Fortunately, ball bearings, like various parts of the "Deacon's One Hoss Shay," are satisfactory if they last as long as their associated mechanisms. The requirement may therefore be modified to read: *Any material may be used that will not, under the working load, be stressed sufficiently beyond the proportional limit, to bring about its destruction before the lapse of a desired working life.* These conditions permit the use of practically all of the materials known to mechanical engineering. With very few exceptions, however, the load conditions are such as to demand steels of the highest grades and these most carefully tempered. For automobile use, with which this paper is primarily concerned, no others can be considered. That puts out of the running all merely case hardened materials. In these there is always a more or less sharply defined change of structure at some distance below the surface. Continued working will cause a loosening of the hard shell from the softer core, soon followed by a breaking up and very characteristic flaking of the surface. Usually this flaking is local; its action is increasingly progressive, soon involving the entire bearing.

What has been said of case hardened materials holds true also for those carbon steels in which the hardening is not carried substantially and equally through the entire mass. I have here half of a ball. In this a sharp structural change due to hardening occurs at a fairly uniform depth of one-sixteenth inch below the surface. The ball has evidently been run under conditions which shifted the load over its entire surface; it was used in a running test and then broken to examine its structure. It so happened that the ball was caught just before it was ready to fail by flaking. The entire hardened surface has been loosened from the core in such way as to form an inner ball. Some relative movement of this shell and inner ball has undoubtedly taken place, as is evi-

denced by the polished condition of the inner surfaces. The ball is from a series of tests made to try out various materials; this particular grade is very evidently not suitable.

What is true and required of the ball materials is even more so for the races. With time the ball presents its entire surface to the load, the small vibrations and changes of load being sufficient to frequently bring in a new axis of rotation. Not so the race; that is fixed and so always exposes the same surface element to the load attack.

Absolute Accuracy Is Always Essential.

The requirements of a good ball are:

a. *Truth of shape and size.* The permissible limit of error will vary with the character of the material. In general, the better the latter, that is to say the smaller its deformation under a given load, the more accurate must the ball be. It is evident that, were a ball so much larger than its fellows as not to deform sufficiently under its share of the load to permit the others to carry, that it would then not only itself have to carry more than intended, but would also transmit more than intended to the supporting surfaces of the races. If, on the other hand, the ball were smaller than its mates, it would be underloaded or not loaded at all, and the others correspondingly overloaded. What has been said of variations in ball size, of course, applies similarly to variations from truth of outline.

All requirements will be met if the balls are true to shape within one ten-thousandth part of an inch and if all of the balls used in each individual bearing have a similarly small error in size. It must not be inferred that for materials of lower grade, larger inaccuracies are permissible. Were the load distribution the only factor, that conclusion might be justified; greater inaccuracy of size means greater deformation and therefore greater departure from sphericity and the substitution of too great a percentage of sliding for the rolling aimed at. Considerable initial variations from truth of shape have precisely similar results.

b. *Surface finish to a very high degree is also essential.* What is usually considered a very good finish indeed may be characterized as totally inadequate. The recognition of grinding or polishing marks not only by the bare eye, but with an ordinary pocket reading lens, condemns balls utterly; this is true of a bearing having long life under high loads and speeds. Oft repeated endurance runs under conditions where the finish was the only variable have abundantly proved this, at first unsuspected, fact. This was discovered while investigating an apparently inexplicable difference in lasting qualities. As life is too short for a try out under normal loads, overloads were resorted to; they demonstrated conclusively that the higher the finish, the better the endurance. The high finish must not be of the Brummagem or Reuleaux's "cheap but nasty" variety.

c. *The Elastic limit* should be as high as can be had. A limit of proportionality above the elastic limit is desirable.

d. *The hardness and uniformity of hardness* throughout the mass of the ball to the highest attainable degree is essential.

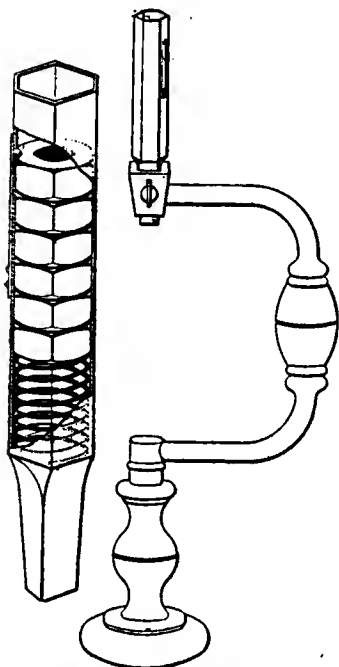
e. *Correct knowledge* and uniformity are more important than even these requirements of high elastic limit and hardness. It will not do to say that, though some balls of a lot may do better than others, the design may be based on the poorer ones. That would result in the better balls carrying more of their share of the load, much as and with the same bad effects described while considering truth of shape and size. Lower quality, provided it is uniform, can be allowed for. It will then merely affect dimensions.

Ball making machinery has arrived at a very considerable state of perfection; but balls within a limit of one ten-thousandth of an intended size are not yet being made without the sacrifice of other qualities. That is, however, not important beyond having some slight bearing on cost, since it is perfectly feasible to select and grade balls within the desired limit; but the hardware dealer's word for uniformity of size is not a safe guide; he is perfectly honest in throwing odd lots of 5-8-inch balls into one box and in thinking the customer who objects because they vary a half-thousandth, or even two, a "finicky crank."

(To be concluded.)

WHAT AUTO INVENTORS ARE DOING ABROAD

It has always been more or less of a mystery to the average autoist just how the magazine wrench used in connection with dismantable rims for racing, stowed away the nuts so neatly as they were flipped off the rim one after the other and also how it automatically released them for further use when replacing the rim. Just how it works is plain at a glance at the accompanying illustration, and doubtless its extreme simplicity will be the first thing to strike the observer. One of the old types of braces is shown in the illustration, but as the tool is provided with a regular bitstock it is quite evident that the bit may be employed equally well with any brace. The tool is nothing more or less than a socket wrench with sufficient length of hollow stock above it to accommodate the number of nuts required—never more than six in the case of foreign racing rims as shown by the cut. As they are received one by one, they serve to compress a helical spring in the butt of the tool and are retained by an automatic catch at the side, the operator not having to touch

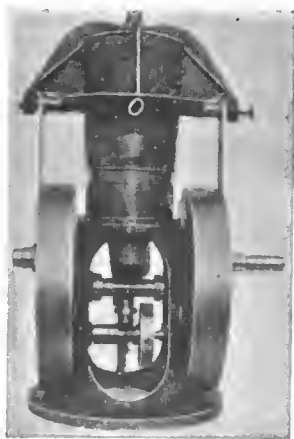


NEW MAGAZINE WRENCH.

them at all. To replace, releasing the catch in question brings the last nut to be taken off at the end of the wrench, a new one coming forward each time the catch is released. The illustrations are taken from *Omnia*.

A Motor with Reciprocating Cylinder.

Rather a novel motor that is of interest as illustrating one of the many forms in which the internal combustion engine may be made is illustrated and described in the *Motor Trader* of recent date. Page Renouf is the inventor and the motor is termed the auto-cooler, and though no special provision has been made for air-cooling, it is claimed that the motor may be dismantled with bare hands after having run for some time. The piston is stationary and integral with the pedestal of the engine, the model built being of the stationary type. Another novel feature of the piston is that it contains the valves in its head, the latter being concentric with the inlet valve lying inside the trunk carrying the exhaust; this stationary piston is fitted with the usual rings. Any extra weight necessary in this part of the motor is said to be more than compensated for by the lightness of the cylinder. Besides this, the impulse being the reverse of that of the standard type of motor, the connecting rods are in tension on both the compression and power strokes, which enables their sectional area to be greatly reduced. It is said that the sum of these factors amounts to a substantial reduction in the weight of the reciprocating parts. These connecting rods are fastened at their

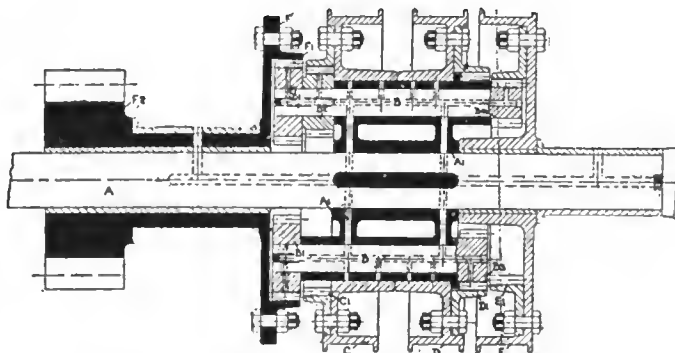


RENOUF'S AUTO-COOLER.

upper ends to two horns and below to two substantial flywheels which are carried on a short straight shaft. Lubrication is effected automatically by the cylinder dipping into a groove formed in the base casting and kept constantly filled with oil, which is thus forced up the cylinder rim by displacement. A standard type of float-feed, atomizing jet carbureter is employed. The appearance of the engine in complete running order is shown by the accompanying illustration reproduced from a photograph.

A Novel Three-Speed Planetary Gear.

Though it has its disadvantages, it also has its good points, and the latter are such that the planetary gear continues to be a factor, although it has all but disappeared from everything but light cars in this country. The Englishman favors the epicyclic, as he dubs it, and study has resulted in the production of ingenious modified types, such as the Adams-Hewitt and the Fairfax, which are planetary gears that are not planetary, as the first employs no orbit or internally toothed rings and the latter has



SECTIONAL DRAWING OF FAIRFAX EPICYCLIC GEAR.

no sun wheel, only the planet pinions and racks being employed. These are referred to in the *Automotor Journal*, which publishes a detailed description of the latter.

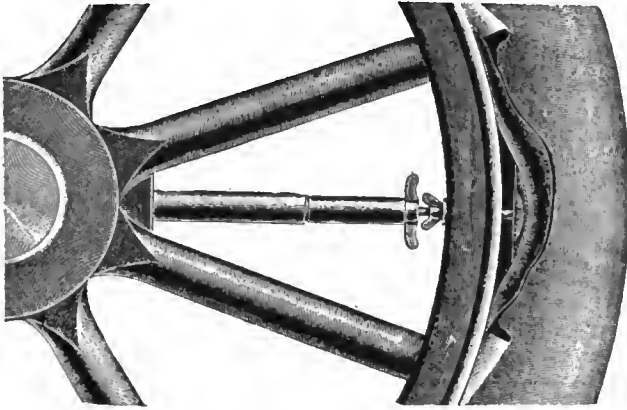
The chief advantage gained by the construction found in the Fairfax, as compared with the more usual form, is that it can be made to give a much greater range of gear ratios than is otherwise practicable. For instance, it can be designed to give a ratio of 1 to 14 on one speed, while at the other extreme this ratio may be increased to 1 to 37.03, such is its range. Between these two extremes twelve different gear ratios are possible without changing the final train of pinions. The detailed arrangement of this gear is made plain by the accompanying sectional elevation of one of this type constructed for use on a heavy steam lorry.

In this particular form of the Fairfax gear there is no reverse, as the latter is obtained by reversing the direction of motion of the engine itself. There are only three forward speeds, each of which is obtained by holding stationary one of the brake drums, C, D or E. These drums carry annular racks, with which the planet pinions B₂, B₃ and B₄ mesh. The pinions B₂ and B₄ are mounted on the same spindle, but each of the pinions B₃ is on an independent spindle in conjunction with one of the planets C₁, through which power is transmitted to the rack F₁, on the driving member F, which also carries the large spur gear F₂. Each planet pinion has its duplicate on the spindle diametrically opposite, so that the strains on the mechanism are balanced.

To Prevent Pinching the Inner Tube.

One of the most frequent annoyances in fixing an automobile tire is the danger of nipping the inner tube, with, as a result, the bursting of the air chamber before the car has traveled any great distance. When mounting the tire one hand is engaged in holding up the lug, while the other pushes the beaded edge of the

shoe into position. Failure to do this will result in the tube being held in the fierce grip of the shoe. A French device has been produced by which the lug is held up, leaving both hands free for working on the outer shoe. It is a simple but useful ap-



DEVICE FOR PREVENTING INJURY TO INNER TUBE.

pliance, the construction of which will be readily understood by an examination of the accompanying illustration. Charles Durand, of 178 Boulevard Periere, Paris, is responsible for the tool, which is now being placed on the market.

A Trap for Mischievous Boys.

An English autoist who has probably had his patience taxed by the ubiquitous small boy surrounding his car and taking liberties with it while it is reposing at the curb, has exercised his inventive ingenuity on the problem of devising an effective device to make the inquisitive youth have a wholesome respect for the innocuous looking "buzz-wagon." By taking advantage of the fact that most cars are equipped with high tension coils and carry batteries, he has devised a system which is described in *Motoring Illustrated*. For those who find themselves similarly minded and wish to teach the urchin who would defile the paintwork of a car by scratching his initials on it, the following directions taken in connection with the accompanying diagram of the necessary wiring, will be found useful.

Run a low-tension wire from one of the terminals of a spare battery to a tumbler switch, such as is used for electric lighting. This should be fixed to the dash or under the seats. From the other terminal of this switch run another low-tension wire to one of the two primary coil connections. These usually have dis-

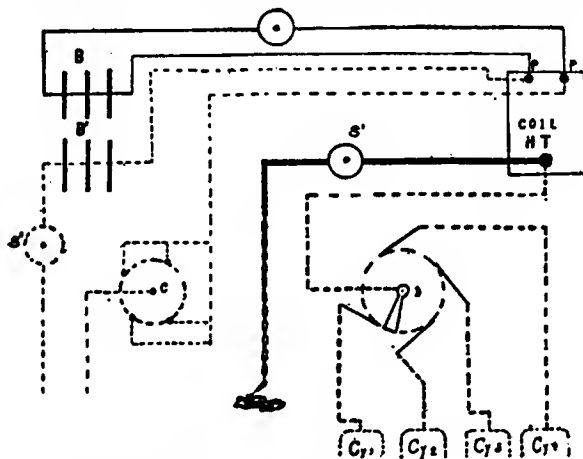


DIAGRAM FOR CONNECTIONS FOR A SHOCKING CIRCUIT.

tinguishing letters, but in a coil which is already coupled up for ignition work they will be those terminals to which low-tension wires are already attached.

Run another low-tension wire from the unoccupied spare battery terminal direct to the second primary coil connection. If

the switch be now closed, the trembler will immediately vibrate, the ordinary ignition circuit being switched off altogether.

Carry a high-tension wire from the secondary coil terminal (*i.e.* that terminal from which a heavy high-tension wire already passes to the distributor or spark plug) to one terminal of a tumbler switch mounted on a porcelain base.

From the other terminal of above switch, run a high-tension wire under the floor to the end of a length of chain sufficient to trail on the ground. Solder the connection between wire and chain. Screw to the underside of floor a hook, upon which to hang the chain when not in use. Secure the wire to the under side of floor by insulated staples, or other suitable means, to obtain firm support from the chain without making electrical contact with the car frame. Do not fasten the chain itself to the floor, unless it be by means of an insulated screw-eye.

If, now, the switch controlling the primary or low-tension circuit be closed, the coil will "buzz," but nothing else will happen until the chain is lowered, and the second switch controlling the high-tension or secondary circuit is also closed. The frame will then be alive, and ready to give a shock to anyone standing on the ground who ventures to touch it. In putting the shocking device out of action, first open the primary switch, then open the secondary switch, and haul up the chain.

The accompanying diagram will make clear the method of connecting up. The existing ignition circuits are shown in dotted lines, thin for low-tension wires, heavy for high-tension wires, the new connections being shown as continuous lines, likewise thin and heavy for the primary and secondary circuits.

In this diagram, B is the spare battery used exclusively for shocking purposes. S and S₁ are switches controlling the primary and secondary circuits; on the latter is the length of chain trailing on the ground. P and P₁ are the primary coil connections, while H T is the secondary or high-tension coil terminal. S₂ is the switch on the ordinary ignition circuit, B₁ being the ignition battery. C is the timer, and D the distributor from a four-cylinder engine using one coil. Cy 1, 2, 3, 4, are the four-cylinder heads, into which the sparking plugs are screwed.

In a car using a number of coils in place of a distributor, any one of the coils could be used for shocking purposes, the others not being interfered with at all. With magneto-fired engines, the connections are exceedingly simple, an additional high-tension wire merely being taken from that terminal to which a wire already is attached from the distributor or sparking plug, to the chain as above indicated, a switch being introduced somewhere along its course to break the shocking circuit when not required. With magneto ignition, the engine must be running all the time the shocking device is in operation, in order to furnish the necessary current. After having installed such a shocking system, doubtless the owner who would chastise the pestiferous small boy will find that he himself is the first to get the benefit of it until he remembers that it is there and working.

PREDICTING THE FUTURE MOTOR OMNIBUS.

Although the motor omnibus has come to stay, it grows daily more and more evident that it will not—indeed, cannot—remain in its present form, concludes the *London Times*, which says:

"Before it can be ranked as a successful vehicle it must be considerably reduced in weight, and therefore to some extent in carrying capacity. If the reform does not come from within, it will assuredly be enforced from without for the wear and tear of suburban roads, the extremely serious deterioration of roadside property, due to the noise and vibration inseparable from these huge cars, are raising most strenuous opposition. A few days ago a deputation from Paris arrived in London for the purpose of investigating the traffic problem as dealt with in this city, and particularly with regard to the motor omnibus question. This deputation had an audience with the chief commissioner of police, who, in the course of his remarks, gave it as his opinion that the motor omnibus of the future must be a much smaller, lighter and quieter vehicle than that at present in use."

LETTERS INTERESTING AND INSTRUCTIVE

Some Questions on Track Records and Ignition.

Editor THE AUTOMOBILE:

[794.]—In your issue of June 6 you credit Cedrino in a Fiat with a world's record for middleweight cars. Did not Frank Kulick, in a 20-horsepower Ford, made up of two Ford double-opposed engines, make a better record than that in the Fall of 1904? I believe he also holds the middleweight one-mile record, generally credited to Cedrino.

Après of the spark question. I have a car equipped with a Remy magneto. I find that on trying a vibrator coil on same when testing for a misfire, that I cannot take a certain hill on the high speed, though the miss is gone; that with the magneto on I ascend easily, though I change nothing else but the coil, and give the right spark amount of spark advance in each case, using even the same distributor and commutator. Could you investigate the question and state the result in your "Letters Interesting and Instructive" columns, and oblige a three-years' subscriber?
T. C. B.

Los Angeles, Cal.

The then existing records for middle-weight cars were broken by Frank Kulick at Narragansett Park, Providence, R. I., September 10, 1904, the times being as follows: One mile, 1:04 1-5; two miles, 2:05; three miles, 3:06 2-5; four miles, 4:07 4-5; five miles, 5:09 4-5. Present records for middle-weight class are: One mile, 0:56 2-5; two miles, 1:52 4-5; three miles, 2:49, made by E. Cedrino, in Fiat, Empire City track, October 27, 1906; four miles, 4:01 3-5, made by Jos. Tracy, in a Renault, Empire City track, September 24, 1904; five miles, 5:00, made by Guy Vaughn, in a Decauville, Syracuse, September 18, 1905. Frank Kulick holds all track records up to and including five miles for light-weight cars, made in a Ford, at Empire City track, the times being as follows: One mile, :55; two miles, 1:54; three miles, 2:51, all made November 8, 1904; four miles, 3:48 2-5; five miles, 4:43 3-5, both made October 29, that year. The time for the one mile was intermediate.

As the magneto generates an alternating current it naturally cannot be used to the same effect with a vibrator coil as with a plain coil, the alternations of the current taking the place of the trembler. When the armature of the trembler is attracted by the core of the coil becoming magnetic the circuit is broken and the surge of current thus sent through the primary is transformed in the secondary winding of the coil. The spring causes the armature to return the moment the magnetic force ceases, owing to the rupture of the current and the moment the blade comes back it again makes contact and the operation is repeated. A magneto, on the other hand, produces a current that surges from zero to its maximum constantly, first in one direction and then in the reverse, hence its name of alternating. The coil in consequence starts to act on the first alternation, but when the trembler returns and again makes contact there is no current and the coil is momentarily dead, which would naturally cause the motor to miss, if its proper time of firing should occur at that point. The armature of the magneto only carries a single winding and, as arranged for ignition purposes, there is a contact breaker set to act at the point of maximum current flux, or peak of the wave as it is termed, so that only two current impulses are utilized per revolution—exactly the number required to fire a four-cylinder engine, the magneto being geared to run at the same speed as the mainshaft of the motor. For a more detailed explanation of the action of the magneto we would refer you to the article which appeared in the issue of THE AUTOMOBILE of April 4, under the title of "How the Magneto is Utilized for Ignition." This makes no definite reference to the use of the coil in the connection explained above, but illustrates the character of the current generated and the manner in which it is utilized on the car. Only a plain or non-vibrating coil should be used with a magneto of the Remy type. A trembler coil may be employed by screwing the former down fast so that it cannot vibrate, but the results are not apt to be as good as with the coil wound especially for the current generated by the magneto.

Proper Point of Stroke at Which to Fire Charge.

Editor THE AUTOMOBILE:

[795.]—I have a 1907 Model G, four-cylinder Franklin, dimensions 3 1/4-inch bore and stroke. I would like to learn through "The Automobile" at what point of the compression stroke the cylinder should fire to obtain the best results with the spark advanced. The cylinder now fires about 1-4 inch before the compression stroke is complete. Is this correct?
CARTON.

St. Louis, Mo.

As the motor of your car is designed to run at a pretty high normal rate of speed, we should think that the position of firing you mention would be about the correct one for the following reasons. The object to be attained is the explosion of the charge at the moment when it will exert its maximum expansive force at the beginning of the power stroke. If it could be assumed that the closing of the primary circuit by the timer of the ignition system, the occurrence of the spark in the cylinder and the subsequent explosion of the charge all took place so close together as to be practically simultaneous, the proper time for the spark to occur would be exactly at the upper dead center or finish of the compression stroke. But such is not the case. There are both electrical and mechanical lags in the ignition system to be accounted for such as the time required to saturate the core of the coil, inertia of the trembler, and the like, and it is also thought that the rate of flame propagation in the mixture is such that this also has to be taken into consideration. This last is a mooted point and doubtless the rate of flame propagation in a compressed mixture is so extremely high that this is not a factor and has no bearing on the subject whatever. The quarter inch before the completion of the compression stroke that you mention is usually termed "lead" and is generally measured in degrees on the arc of the crank circle and marked accordingly on the periphery of the flywheel in order that the motor may be properly reassembled and timed after having been dismantled.

Another Bad Case Similar to No. 781.

Editor THE AUTOMOBILE:

[796.]—Letter No. 781, under heading of "A Bad Case of Heating," describes exactly the trouble I am now having with same kind of car—Marion light touring car, 1905 model. I bought this car new in April, 1905. Ran it the first season over our very rough and hilly roads something over 5,000 miles, carrying four people. Practically, I had no trouble; never broke down or had to be towed. Last season ran the car something over 2,000 miles. As I own two cars, I do not run either all the time.

This season I am using the Marlon as a runabout, and am having just the same trouble as the writer of letter No. 781. Today is a hot one, 90 or over in the shade. Ran the Marlon to Concord (nine miles); on my way home I had trouble; every part of car, including the two passengers, got sizzling hot, engine so hot that it would cook anything; gear drum on countershaft and muffler sizzled. Had to stop engine frequently to let it cool. I cannot say where the trouble is, but I mean to find out and fix it myself if possible.

No. 781 and I are in the same fix. If he can locate the trouble I hope he will write you. If I do, I will.

Air-cooling may not always work as it should; neither does water-cooling. I have seen very high-powered water-cooled cars which got so hot that it came pretty near being dry steam which came out of top of radiator.
C. F. M. STARK.

Dunbarton, N. H.

Your description of the trouble would seem to tally so closely with that given by correspondent No. 781, that undoubtedly the trouble will most likely be found to be the same or something very much akin. The fact that the entire engine and its piping back through the muffler get hot appears to support the rich mixture theory most strongly, as the latter would continue burning not alone on its way out through the exhaust valve but also through the remainder of the piping and so heat the muffler. After a good cleaning up try running on as weak a mixture as the engine will possibly turn over on and then give the fuel admission adjustment a fraction of a turn or so and see

if the trouble does not abate. As mentioned in the answer referred to, a quick-burning mixture is absolutely essential to successful air-cooling, particularly in the early cars of this type.

How Expressions of Analyses Are Read.

Editor THE AUTOMOBILE:

[787.]—I would like to know how to read the expressions generally used in the written analyses of steel. For instance, take the following, referring to the composition of a certain specimen of steel. How would this data be read?

Carbon	Sulphur	Nickel
0.45	0.017	1.17

Also in the report of the strength of aluminum castings published in "The Automobile" of June 6, 1907, I find the following, as expressive of the physical properties of the sample, and would like to know their significance, as well as the way they are read.

Ex-4"	Con.
8.25	9.5 per cent.

Hoping that I have made clear to you the information that I desire, and thanking you for the trouble,
C. C. CROSS.
North Tarrytown, New York.

In speaking of the quantities of the various constituents of a sample of steel as determined by an analysis such as is set forth in your letter, engineers usually speak of these as "carbon point four five," also this particular ingredient is frequently referred to as "10 point carbon, 20 point carbon," and the like. The other quantities are most generally referred to as mentioned just above; that is, "Sulphur point nought one seven," "nickel one point one seven or one point seventeen." Regarding the other abbreviations these refer to the properties of the test piece, the first representing the amount of expansion in the piece tested, the dimension following "ex." or expansion, having reference to the length of the piece in question, so that this should be read, "Expansion in four inches, 8.25 per cent." The second abbreviation refers to the amount of contraction on test in the same piece, so that the dimension is naturally not repeated.

THE WHITE CAR THAT MADE THE HILL-CLIMBS.

Editor THE AUTOMOBILE:

[788.]—I note that in your account of the Cleveland hill-climb in your June 20 issue, in referring to the car with which Walter White made his record climb, you say it is "almost a duplicate in appearance to the famous 'Whistling Billy' of track racing days." This statement is correct except in the following particulars:

- Wheelbase.
- Clearance.
- Length over all.
- Method of suspending frame from axle.
- Size of all working parts.
- Position of generator.
- Position of engine.
- Position of gasoline tank.
- Position of driver's seat.
- Position of steering wheel (as regards which side of car).
- Position of water tank.
- Style and size of bonnet, etc.

I can readily see that your Cleveland correspondent has taken the view, which is so popular with the gasoline people, that our hill-climbing car is a very special affair. As a matter of fact, it is exactly like every other 30-horsepower car that we have built this season, except that it is "tuned up" for hill-climbing work (it is another demonstration of the flexibility of steam power that a standard car, by putting an hour's work on it, can be made to deliver much more power than that for which it is ordinarily adjusted to give).

By "tuning up" I would say, first of all, that, as we can remove our condenser (just as the gasoline cars remove their mufflers), it is possible for us to use a special bonnet, which, of course, gives the car a somewhat rakish appearance. The driver's seat is a slight affair of aluminum placed directly over the generator. We run the car at slightly higher pressure than is required for ordinary touring service. In order to run a White car at a higher pressure, all you need to do is to adjust the "water regulator" with a pair of pliers, as any driver of a White can do in five minutes on the road. We also have a hotter fire than usual by carrying more air pressure on our gasoline tank. This also is something which can be done to any White car ever built at the option of the driver, as any air pressure may be secured by simply putting your foot on the pedal. These, in full, are the changes necessary to make any White car into a "special White racer." We look upon it, as I said before, as simply emphasizing the

flexibility of the White car whereby you can get from it, under all conditions, all the power necessary.

Hill-climbing is the true test of the power of an automobile, and it seems to me significant that we should beat, by such a large margin, such cars as the Darracq, which won the '05 Vanderbilt race, and the six-cylinder Stearns. The former represents the highest development in horsepower per pound of weight. The latter represents the largest cylinder displacement which can be considered as practical. We have an engine the dimensions of which are in all 3x6x4 1-2, and the following is certainly a proposition worth considering:

What would we do to the gasoline cars if we should ever consider it necessary or desirable to add one or two inches to our engine dimensions?

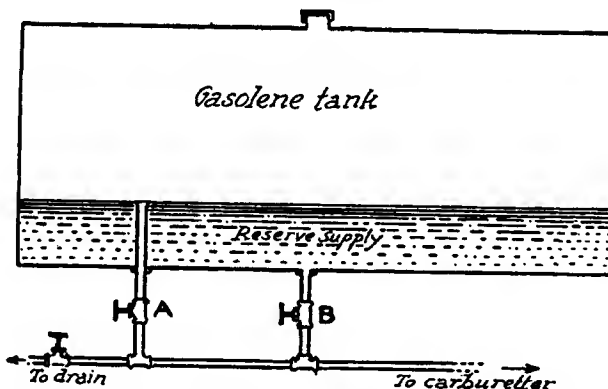
Another interesting fact is that the new regulating system has shown itself to be equally efficient with high pressure as with normal pressures, and all that is necessary for the driver of a "special White racer" to do is to "Just open the throttle and steer."

THE WHITE COMPANY,
New York City. per R. H. Johnston.

PROVIDING A RESERVE SUPPLY OF GASOLINE.

Editor THE AUTOMOBILE:

[799.]—I have noted a recent inquiry in your Letters Interesting and Instructive Department, regarding some simple means of fitting a reserve tank to a car so that an emergency supply of gasoline can always be carried. I am enclosing you a sketch showing how I have done this on my car. There are two connections or supply outlets from the tank, one of which reaches up three inches above the



SIMPLE METHOD OF PROVIDING EMERGENCY FUEL SUPPLY.

bottom of the tank, while the other is level with it; the latter constitutes the draw-off for the reserve supply while the former is the regular supply outlet. This valve (A) is allowed to remain open at all times, while that in the emergency pipe is kept religiously closed. By turning the valve B, a six-gallon reserve supply is tapped and that is certainly sufficient to reach a depot. It is a simple and inexpensive expedient and one that has never failed me.
OLD TIMER.

FOUR YEARS' STEADY RUNNING ON SOLID TIRES.

Editor THE AUTOMOBILE:

[800.]—Answering the letter in your June 13 issue, in which Sol Williams, Cedar Point, Kan., gives "An Opinion on Solid Tires for Small Cars," kindly permit me to say (to your readers who may construe his experience as conclusive evidence) that there are durable cars on the market, also successful solid tires, and that thousands of the latter combination have been used constantly the past four years with entire satisfaction.

Mr. Williams unsuspectingly pays a tribute to solid tires when he says that after two years' use his tires are for sale at half price, admitting that his tires are good for at least four years. He intensifies the compliment by describing the rugged, rocky roads over which his tires have been driven, showing the durability and long life of solids. Mr. Williams may have adopted what he thought would be more resilient spring suspension, but the new springs may be too heavy for the weight of his car, and therefore too stiff to absorb vibration properly, and attributes the trouble all to the tires. If it were usual that such results followed the adoption of solid tires, we would coincide with Mr. Williams, but our experience in the solid tire has been entirely the contrary, and we can show 500 testimonial letters received from patrons in past four years, and all treat the solid tire with words of commendation. We have fitted every type of car from the lightest Orient buckboard to the heavy, luxurious Peerless and Thomas limousines.
Akron, O. A. G. HENDEL.



ENTERING the automobile field a couple of years ago by building a model car with a number of interesting and novel features, the Modern Tool Company of Erie, Pa., put its product through a 10,000-mile test and has just begun to make deliveries to the public of its Payne-Modern automobile. A description of the models is certainly opportune and will doubtless prove interesting to all students of automobiles.

Three models are being produced, a four and six-cylinder touring car and a six-cylinder runabout. The six-cylinder chassis is somewhat heavier than the four-cylinder model, but otherwise the two types are similar. An illustration is shown of the complete four-cylinder chassis and of the six-cylinder touring car.

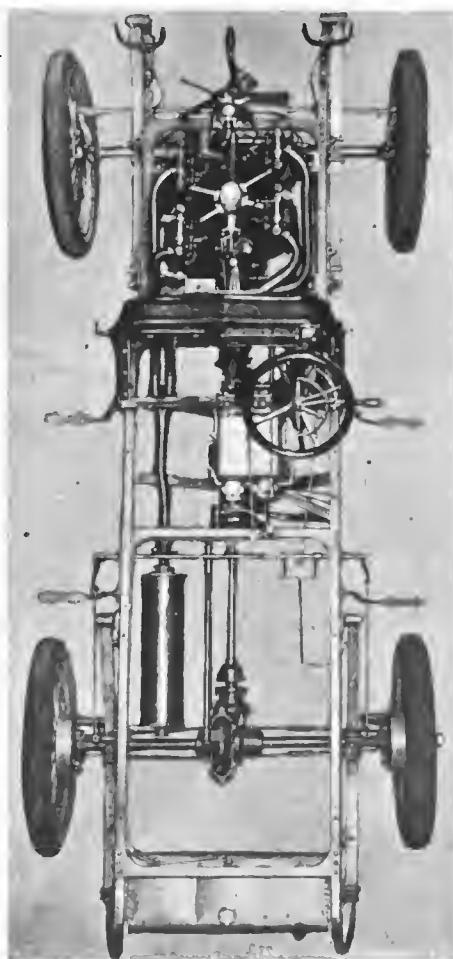
The motor which is air-cooled on all models, is carried forward under the regulation type of bonnet, is attached direct to the side frame, and has separately cast cylinders set at an angle of 60 degrees. An advantage of this type of engine is that a great saving of space is effected, this being specially noticeable with a six-cylinder motor, and a better circulation of air to the cylinders is secured. All cylinders, on both four and six models, are 4 inches bore by 4 1-2 inches stroke, of refined iron, put through a special process before casting. Under test the cylinders are subjected to a hydraulic pressure of 2,000 pounds to the square inch. Cylinders, piston rings, shafts, etc., are ground dead true and do not vary one-thousandth of an inch.

The cylinders are cooled by means of a peculiar copper fin made in two halves swaged into the iron by means of a split collar and steel ball. This has the advantage of copper radiation, several times as efficient as cast iron, but avoiding the former trouble experienced in making a close union between iron and copper. These cylinders, after being rough-bored and fins mounted, are heated before grinding to relieve any strain that might be in the metal. The air is circulated by

means of two fans, one on the periphery of the flywheel and one governor-controlled fan in front of the cylinders. A peculiarity of the action of the fan is that it furnishes a maximum amount of air when the car is at a low rate of speed ascending a steep hill and the throttle wide open, which corresponds to the greatest heating period of an air-cooled motor. It is well known that in an ordinary air-cooled car as the engine slows down the speed of the fan also is retarded. A further feature which adds

to the success of an air-cooled motor is the exhaust valve, its location and operating mechanism. On the Payne-Modern the valve itself is located on top of the cylinder and the valve pallet in the plane of the cylinder wall in such a manner that when the exhaust valve is opened to relieve the cylinder of the heated gases the gas does not have to pass up through the head of the cylinder or out through the side of the cylinder head, but is at once released. This feature adds to the cooling effect of an air-cooled cylinder, especially inasmuch as the valves themselves are abnormally large.

Valve operation is by a peculiar cam motion in which the cam shaft is offset in relation to the crankshaft, the cam plungers also being offset. Each exhaust valve is provided with its own exhaust pipe, having an internal diameter of 1 3-4 inches, open enough to relieve the back pressure to such an extent that there is no appreciable effect on a gauge. The valves are operated by a walking beam and are held on their seats by a conical spring resting on a spider, which serves to prevent them coming in contact with any heated portion of the exhaust cage. They are held on a taper seat in the cylinder head by means of two studs and a bridge provided with two pressure screws, the exhaust and inlet pipes being attached to the valve cages by means of a breech lock nut. To remove the valve as a unit complete with its springs, etc., it is but necessary to give the inlet pipe or exhaust pipe lock nut an eighth-inch turn and re-



CHASSIS WITH FOUR-CYLINDER MOTOR.

lieve the pressure screws in the bridge, allowing this latter to be swung out of the way and the valve removed complete. High speed steel, which serves to prevent any scalding effect from the heat, is employed for the valve stems; the valve pallets are made of 30 per cent. nickel steel. The distributing chamber has certain peculiarities and appears to provide a solution of the difficulty of obtaining an equal quantity of gas to all six cylinders. The carbureter being designed to slightly enrich the mixture at low engine speeds and make it weaker at high speeds, a wide range of engine flexibility is obtained.

The four-cylinder engine is attached to the side members of the frame by means of four lugs; the six-cylinder motor has three point suspension. Although the main bearings of the engine are extremely long, the rear bearing being 1 3-4 inches by 4 inches and the center bearing 1 3-4 by 3 inches, the overall length of the crankcase is only 36 inches. For the engine bearings a peculiar bronze which is neither phosphor nor white bronze, but which has remarkable wearing qualities, is employed.

The commutator is located on the right hand side of the engine in an accessible position and near it is a small automatic air pump for forcing air to the gasoline tank at the rear. The supply of gasoline is fed to a small auxiliary tank on the dashboard, traveling by gravity to the carbureter. On the dashboard is also a small air gauge and relief valve, which may be adjusted to relieve the pressure at any desired point. One pound pressure is usually sufficient. Lubrication is by means of a McCord oiler under a cowl on the dashboard, driven from the camshaft by a V belt, each cylinder being lubricated separately.

An internal expansion clutch, covered with a special material which will not burn, is employed. Four speeds and reverse are obtained by sliding transmission of the selective type, the lay shaft and all gears being idle on the direct drive. The shafts are lubricated by means of ring oilers; bearings are of phosphor bronze. A detailed examination of the transmission shows that the lay shaft is made hollow and provided with a plunger called a timing knuckle. Balls are set in the recess in the hollow shaft and by means of slipping the timing knuckle are forced to engage in a recess in the gears. The shape of the recess in the gears being such as to make a pocket the same shape as the balls, the strain is not a shearing one, but rather a crushing one from all sides; when it is known that a crushing strain on a 1-2 inch ball (the size used in the transmission) amounts to 39,000 pounds, it is obvious that it would be impossible to crush a sphere from all sides. On the main shaft are two lock rings operating in conjunction with the timing knuckle by means of cams, so that the lay shaft may be set in motion and the male shaft disconnected for operating the gears; similarly for direct drive the front lock ring unlocks the gears driving the lay shaft and the rear ring unlocks the cone on the gears of the male shaft, at the same time locking the male and female shafts. Special Tungsten steel is employed for all operating parts in the transmission, the gears and shafts being of chrome nickel steel and all parts hardened and ground. The gear shipping lever has been placed under the steering wheel, it being believed that this position allows of more convenient operation than the more familiar side lever.

Final drive is by propeller shaft and bevel gears to rear live axle of the floating type, carrying bearings outside the tube. On the six-cylinder machine there are four brakes on the rear axle; the four-cylinder model has two brakes on the rear axle and one on the transmission.

Engine control is by means of spark and throttle lever located above the steering wheel. The change speed gear being operated by a lever under the steering wheel, as already described, and all brakes being controlled by foot levers, the machine can be entirely operated without any necessity for reaching outside, everything being close at hand when the storm side curtains are closed down. There are three foot pedals, the right hand one operating the running brake, the center one the clutch, and the remaining one controlling the ratchet or emergency brake interlocked with the clutch.

BOOKS FOR AUTOMOBILISTS.

Michelin's French Guide Book.—The 1897 edition of the French road book published by Michelin & Cie., the tire manufacturers of Clermont-Ferrand, is a carefully compiled and well-produced volume of over 600 pages, giving all the information which tourists in France are likely to need. It contains an alphabetic list of towns, each of which has a clear road map, and information on hotels, garages and automobile dealers; distances to nearest towns and points of interest in the neighborhood are also mentioned. Great care is taken in recommending only the best hotels and those garages where the traveler will be sure of finding good accommodations. Customs, laws and regulations naturally find a place in the book. A valuable feature is a series of colored maps of various sections of France, and a large colored road map of the entire country. Automobilists visiting Europe can obtain copies of the *Guide Michelin* free on board steamships of the French, White Star, and Hamburg-American lines.

Navigating the Air.—Under the auspices of the Aero Club of America an interesting illustrated volume has just been published by Doubleday, Page & Co., of New York, under the title "Navigating the Air." The volume is a record of personal experiences of the twenty-four men most distinguished to-day in the art and science of flying. Such authorities as Alexander Graham Bell announce that the problem of aerial transportation has been solved, and the book gives for the first time an authentic summary of the present state of this science. Among the contributors are Dr. Bell, the Wright Brothers, Lieut. Lanm, John P. Holland and other famous aeronautical specialists. No attempt is made to trace the history of the new art of navigating the airs, but each writer deals with his own connection with the art in a manner calculated to interest both the practical aeronaut and the general reader. The book contains 32 pages of photographs showing important developments in aerial navigation.

French Automobile Trade Annual.—The thirteenth *Annuaire Général de l'Automobile*, a 500-page directory of the automobile industry in Europe, has just been issued by Thevin & Cie., 1 Rue Villaret-de-Joyeuse, Paris. Published in French by a French firm, it contains a very complete list, classified according to industries, of all firms directly or indirectly connected with the automobile industry. Constructors and dealers in other European countries are given in almost as thorough a manner. Sections of the book include: Alphabetic list of all dealers in Paris and district; names and addresses of all automobile constructors in Europe; dealers, agents and garage proprietors; manufacturers of accessories and supplies; a list of all automobile owners in France, and a list of associations, clubs, newspapers and reviews existing in Europe. Persons having business connections with Europe will find the volume exceedingly useful for ready reference.

Road Handbook of the Automobile Club of France.—Visitors to Europe will find a quantity of useful information in the official *Annuaire de Route* published by the Automobile Club of France, Place de la Concorde, Paris, the eighth edition of which has just appeared. French laws, regulations and taxes, which are always a source of trouble to American visitors, are fully dealt with. A feature of the book is a series of sketches of every important town in France, showing all main roads in and out, and the names of all recommended hotels, together with a statement of the accommodation they can offer. Twenty-five other countries are similarly dealt with. The book is printed in French.

Automobile Industry in Italy.—A guide to the rapidly developing automobile industry in Italy has been produced by L'Automobilc, 12 Via Aurelio Saffi, Milano, consisting of a complete comparative table of the products of every Italian factory and a detailed alphabetic description of mechanical features, extending over about thirty pages.

DENVER, June 21.—Geographically considered, Denver occupies a central location between the Great Lakes and Mississippi river on the east, and the Pacific coast on the west, and is the mid-way point of the central transcontinental railway system, with its branches and connecting systems north and south. Naturally it possesses a splendid position for the facilitation of business—an essential characteristic for the automobile selling industry. Coupled with this excellent mid-west location is the altitude of the city above sea level, some 5,000 feet, at the eastern base of the Rocky mountains, and at the western termination of the great central plateau. The highly rarified atmosphere of the locality makes automobiling a pastime of exceptional pleasure and health-giving qualities, and the excellent roads that abound in the vicinity contribute the finishing touches to the autoist's sense of satisfaction.



that is attractive in a tour of the mountain roads, with their grades and turns and splendid outlooks. It all depends upon the mood you are in, and which will most appeal to you.

A favorite run is that to the prairie by the way of Mount View boulevard, a broad roadway that starts at City Park, the largest of the city's breathing grounds. The road bed is a natural one, and is in fine condition at all seasons of the year, and right here it might be stated that

There are any number of fine runs out of Denver, either to the mountains on the west, or over the prairies on the east, with the mountains always in sight, to remind one of the giant upheaval of the



AUTOING ON MOUNT VIEW BOULEVARD.

earth's crust some millions of years ago, which rent the great continental plain in twain, and tossed heavenward the towering peaks and crags to serve forever as a tribute to the majesty of nature's forces. There is much to praise and admire in a run over the prairie roads these fine spring days, with

Denver is an all-the-year autoing city. During the past winter there have been but six days of snowy weather. The run to Colorado Springs, a distance of 81 miles by road to the south, is one of rare attractiveness to tourists, and is the course upon which the local speed enthusiasts burn up their energy—and their tires. The road extends along the foothills of the Rockies in close proximity to the tracks of the Denver and Rio Grande Railway. There is a climb of some 2,200 feet on the route that leads direct to the Springs, and on the return trip a rise of 1,000 feet has to be negotiated.



EARNING HIS PASSAGE.

The Cherrelyn horse car runs between Englewood and Cherrelyn, two of Denver's suburbs. The horse pulls the car up hill for about one and one-half miles and then rides back on the rear platform.

such a scenic setting in the west, and there is equally much



The present holder of the record over this course is E. Linn Mathewson, of this city, who, in a 40-horsepower Oldsmobile, on March 22 drove to Colorado Springs in two hours and eleven minutes, and made the return trip to Denver in two hours and four minutes, clipping 41 minutes, all told, from the previous record, held by Marvin H. Fechter in a Reo. As the one-stop express trains take two hours and fifteen minutes for the trip each way, it will be seen that the autoing Denverites exceed the speed limit a little, and may be said to be "going some."

To the north of Denver the roads are not as good as they are to the south and east.



REPRESENTATIVE HOUSES IN DENVER'S AUTO ROW.

One soon encounters open country and road which stretches away to Greeley and Cheyenne, while fairly good in spots, is not all that can be desired. The mountains remain in view for miles, although the Medicine Bow range gradually melts away to the northwest, diminishing in the horizon as one goes further north.

Denver has speedily adapted itself to the resultant conditions that come from the activity of the trade and the enthusiasm of the buyer. The organization of the Colorado Automobile Club was the first expression and outgrowth of the local automobiling sentiment in and about Denver, and is the pioneer club of the State, and the leading spirit in the recently organized State Automobile Association, which is a component body of the American Automobile Association. A beautiful home for the Colorado Automobile Club is now assured, and the house will be built on a site selected on Mount View boulevard. Dr. F. L. Bartlett, the energetic president of the club, is the head of the committee in charge of the work.

The development of the trade in Denver within the past few years has been astonishing. There are two manufacturers here, one producing a gasoline car, and the other an electric. The Colburn Automobile Company has recently moved into a well-appointed factory at Colfax avenue and Fifteenth street, and is now producing a four-cylinder 25-horsepower car, with a sliding gear transmission, using the selective type of operation, and having four forward speeds with direct drive on the third. The car is known as the Colburn "Skyscraper," and with full equipment, including top, will sell at \$3,250. In the line of electrics made in this city, there is the Fritchle car, made by Oliver P. Fritchle at his Clarkson street factory. He began the manufacture of electrics two years ago, and the designs embody the runabout Stanhope and Victoria types.

There are nearly a score of auto selling agencies in Denver, and all the leading makes are represented. Trade has opened up with a rush this spring, and everyone connected with the selling industry here takes a roseate view of the future. A decided impetus was given to business by the recent local automobile show, which was held in Coliseum Hall last April, and which was a great success.

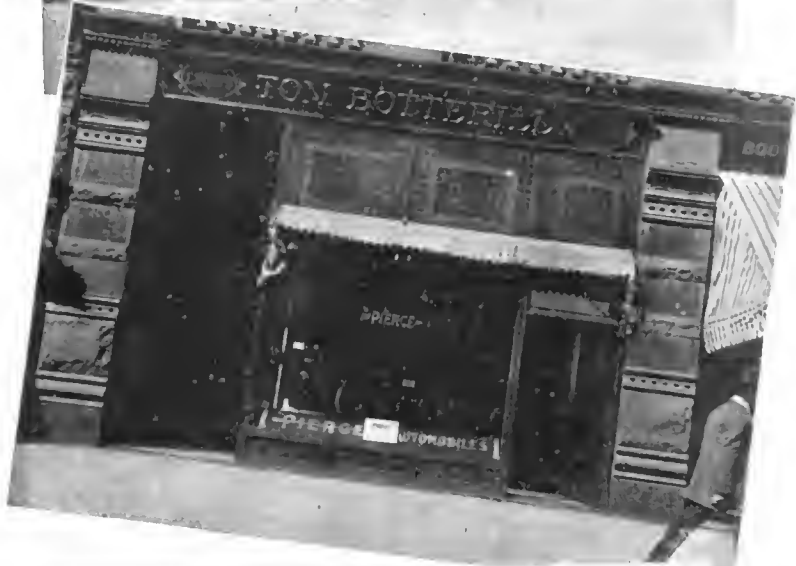
But with all Denver has already accomplished in the comparatively short period that the city has been a factor in the industry and the sport of automobiling, we are far from content. The local automobile club has demonstrated that it is an organization that can do things or, to put it in a slightly better way, "get things done," and after all that is what counts. Plans have been made to establish four main highways leading from the city to outlying points on the four points of the compass, and both the Chamber of Commerce and the Real Estate Exchange have been enlisted in aid of the project. The scheme is to make Brighton, Golden, Bennett and Littleton the main connecting points for these driveways, the plan being to connect Bennett either by way of Colfax avenue or Mountview boulevard to a crossroad along the Union Pacific tracks, thence to the end. Downing avenue will be the main northern road as far as Thirty-sixth street, and from there it would turn to Wewetta street and thence out to Brighton. South Broadway or South Logan is suggested as the approach to the southern outlet, the proposal being to include Washington Park and thence south to Littleton, while the Golden road is planned to cross the Fourteenth street viaduct, along Cherry Creek drive to Lake Place, thence to Boulevard F, and from there on West Thirty-eighth avenue will form the western route. At a recent meeting to further the project, T. K. Bartlett of the Good Roads Association presided, E. A. Colburn and W. A. Hoover represented the club, J. P. Hymer was a delegate from the Real Estate Exchange, and W. M. Downing and C. L. Burpee sat for the Chamber of Commerce. The plan is to ask the municipality to put these roadways in shape and maintain them as far as the county lines, while the counties are to be asked to maintain their portions. George E. Kessler, the boulevard and park expert from Kansas City, has been called in consultation and is preparing detailed plans for the improvement.

That Denver is keenly interested in every phase of automobiling is shown by the enthusiasm displayed by its advocates in every branch. The race meeting held on Memorial Day was the most ambitious event of its kind ever held here while the Orphans' Day celebration of June 12 proved that Denver's autoists are as charitable as those of other large cities the country over, though unfortunately that does not entirely serve to convey the meaning it should, as the call for cars did not meet with as generous a response as should have been forthcoming for such a worthy object. But the result showed very plainly what can be done and there is very little doubt that next year people will realize better the object to be accomplished and fall into line in greater numbers to aid the strenuous endeavors of the local club to be responsible for a bright day in the lives of the many homeless children—a day that they will look forward to as the average youngster does to the Fourth and Christmas.

E. Linn Mathewson and H. S. Brinker were the stars of the Decoration Day meet here and autoists, not to mention a large part of the general populace, including, of course, those juvenile hero worshipers that abound here as everywhere, did not let the opportunity pass to show their appreciation of automobile racing on a circular track, as it was naturally the only kind of auto racing they have ever had a chance to see. No less than 6,000 went to Overland Park, the scene of the meet, and the amount of enthusiasm displayed was all out of proportion to the attendance, though this represented a showing far in excess of what has characterized meets of far greater importance that have been held and featured with far greater attractions in Eastern cities, even when the track racing game was at its height. Mathewson has been dubbed the Barney Oldfield of Colorado and Brinker the "little dare devil" for their work with Thomas "forties." Overland Park was the scene of the meet and Denver turned out 6,000 strong to cheer.

When, after some pretty work, Mathewson lowered the world's fifty-mile track record for stock cars from 1:03:19 3-4 to 55:43 2-5 there was an ovation tendered him such as has seldom been granted to any victor of the mile circle here or anywhere else. Pandemonium reigned supreme for a good quarter hour. Following the Mexican custom in showing approval of a particularly clever coup in the bull ring, a large part of the spectators tossed their hats, canes and everything else throwable onto the track and then followed themselves, so that Mathewson was almost mobbed. He had everything his own from start to finish, the 20-horsepower Stevens-Duryea, driven by Ralph W. Smith, which finished second, being two miles behind, while Brinker in the other Thomas "forty" was the victim of a mistaken flag signal, the latter being waved at him as an indication that he was entering on his last lap, when in reality he had only completed forty-eight laps all told. Minor derangements caused him to come to a stop twice during the course of the race, by which he was lapped twice by Mathewson, but in spite of this he stood a good chance to finish a close second had it not been for the error in signaling. Maxwell, who drove the Stevens-Duryea, looked a sure winner at first, holding the lead for six miles, when he was compelled to stop. Mathewson then took first and was not headed again throughout the entire fifty-mile run.

The first race of the day was a five-mile event, with the same entrants as the fifty-mile endurance race, Mathewson finishing an eighth of a mile ahead of Maxwell in the Stevens, Brinker not being in the running owing to two of the plugs giving out at the same time. The only entries in the next race were the 20-horsepower Stevens-Duryea, driven by Maxwell, and Fred Powell in a 30-horsepower Pope-Hartford, the former easily taking the honors. The fourth event was another five-mile race and in this Brinker crossed the line an eighth of a mile ahead of Mathewson, who had been delayed by engine trouble. The two rivals met again in the ten-mile handicap event, which was the seventh on the program, both starting from scratch. Although his time was not very fast—the best mile being done in 1:05 1-2—Brinker again led Mathewson by an eighth-of-a mile.



A FEW MORE OF DENVER'S LEADING AUTO HOUSES.



FIFTEEN kilometers eastward from Pont Aven one strikes the route nationale again at Quimperlé, charmingly situated on a little tidewater river with a couple of admirable old churches, some curious houses and a good café-hotel, the Lion d'Or, on the quai, where you will call if you are wise.

Lorient is twenty-one kilometers east of Quimperlé and is an ugly, unappealing seaport, once the headquarters of the French East India trade. It is the least lovely large town in France, in spite of the fact that it is endowed with a magnificent situation. The hotels and *mécaniciens* are on the same level of mediocrity. The inner man and the automobile will find nothing here that may not be had better elsewhere.

Ten kilometers after Lorient is Hennebont, situated on the estuary of a deep-cut little river, the Blavet. It is all Lorient is not, an ideally picturesque spot with charming promenades along the river banks, some old moss-grown fortifications, innumerable curious old houses, a stupendous late Gothic church and a most excellent hotel with "good enough" garage accommodation. If you have slept at Pont Aven cut your journey here and take déjeuner in this all-sufficient little Breton Hotel de France at Hennebont.

If time presses keep on to Auray, where, at the Lion d'Or, you will do equally well, twenty-eight kilometers farther on.

The monuments of Auray and roundabout are very numerous and interesting. There is a pilgrimage to be made to Ste. Anne d'Auray—where on the 25th of July in each year is held a great religious fête—and the excursion down the great peninsula of Quiberon and through the *Lignes de Carnac*, the name given to a regiment of great stone *menhirs* like those at Stonehenge in England, only here there are thousands instead of scores.

A Glimpse at the Summer Retreat of the "Divine Sarah."

Off-shore, a dozen kilometers, is Belle-Ile, where Fouquet ensconced himself when he fled from the wrath of his King after the great fête of Vaux, and where Aramis of the "Trois Mousquetaires" became a landed proprietor. To-day Belle-Ile is a little island kingdom all by itself, with a capital, Le Palais, a local newspaper and hotels and restaurants, even though a good half of the population have never set foot on the mainland. There are no automobiles on the island, and the greatest celebrity is Sarah Bernhardt, who has a summer home here.

From Auray to Vannes is twenty-odd kilometers, skirting the north shore of the Morbihan, a great inland bay like the Great South Bay of Long Island, with characteristics much the same, except that the picturesque peasant is wanting in America and we have to content ourselves with a gray-bearded old sailor in oilskins and a so'wester instead of a gay gallant with a hat with fluttering ribbons on it, an embroidered vest and tight-fitting trousers with fifty brass buttons down the outside seams.

On the road hereabouts the Breton types are seen at their best, young men and maidens and old men and market-women, but all of them picturesquely clad. They invariably walk in the middle of the road and it takes more than a mere "honk" to make them move; a shrill screech of a siren will do it, but that's about all. It is bad form to use a siren in a French town.

Another warning right here, though it might well have been put at the beginning of this article. There is an infrequency of automobiles in Brittany, and for that reason live stock, particu-

larly horses, donkeys and mules, are easily frightened. There's no pleasure or satisfaction in bolting a donkey cart into a ditch and spilling out its invariable load of lovely femininity—for they are lovely, the little Breton maids. Go slow, then, and be rewarded by smiles instead of frowns.

At all times, when stopping, look carefully over your tires and extract the *sabot* nails, the great flat headed hobnails of the Breton peasant's sabots which drop out in dry weather when the wood around them shrinks. They don't puncture all at once—if you are using what the French call *pneumatiques extra-fortes*. This variety is indeed a necessity all over Europe if one is to avoid slight punctures; these short, pointed, flat-headed nails will not penetrate if your tires are thick enough; if they are not you will suffer continual annoying punctures. In Brittany one must be more careful than elsewhere.

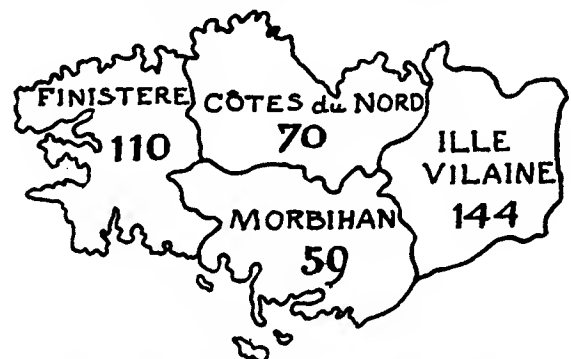
Vannes is a great, big, overgrown country town. It rises to the dignity of being a Préfecture, but is a sad, dull place with inefficient hotels and only interesting for the visitor because of its accessibility to the Golfe de the Morbihan, its old houses, its thirteenth century cathedral, its old city walls and the grim donjon known as the Tour Connétable, in 1387 the prison of Olivier de Clisson.

Pass Vannes by so far as eating or sleeping goes if possible, and keep on to Rochefort-en-Terre or Redon; you will do far better at the Hotel le Cadre at the former place or the Hotel de la Post at the latter. Each abounds in character, a vague term, but one understood of the traveled person. Rochefort-en-Terre is a little artists' paradise exploited almost entirely by French and Americans; *jamais les Anglais*, says the patron of its little next-to-the-soil hotel.

Railroad Crossings Which Only Open Under Protest.

If the atmosphere here is *too* artistic another twenty kilometers brings you to Redon, and if you don't have to wait an interminable while at the railway gates you will be very pleased indeed with your déjeuner eaten in the *salle à manger* of the Hotel de la Poste—one might say the *musée*, for the walls are hung with all sorts of curious trumpery—some of it good, but certainly as great a hodge-podge as was ever collected by a cranky hotel proprietor. Barring this idiosyncrasy he knows well how to run a hotel, though it is abominably situated opposite the railway station and has no pretence to architectural beauty of any kind whatever.

The gates of the railway crossings throughout Brittany, and frequently in other parts of France as well, are often kept closed. This is a protection for the public, of course, and cannot be complained of, beyond wishing that the day may soon come when *all* grade crossings shall be abolished. It's annoying, nevertheless, to be held up at a French railway crossing, or *passage à niveau* to speak the vernacular. Usually it is guarded by a feminine personality of uncertain age, who simply tells you in response to an inquiry, "*On ne passe pas!*" "Where is the train?" you ask, with an absolutely clear view up and down the line for five kilometers, "*Il peut venir,*" she tells you coldly. "Yes, truly, it *may* come; but why does it not come?" You wait perhaps, three, five, ten,



THE AUTOMOBILES IN BRITTANY ARE NOT MANY.

or fifteen minutes at this Robespierre of *passages à niveau*, but the woman is incorruptible—as she should be, that we will not deny. Yes, it *may* come! And when it does come, and you have overheated your motor running it free, or have perhaps stopped it and by some mal-chance cannot make it start up again, you have emotions which cannot even be described, much less put into decent print.

From Redon to Chateaubriant is fifty-four kilometers, and if you have had enough for the day the modest little Hôtel de la Poste will care for you admirably. You will eat of simple fare served by a dainty coiffed Breton maid, and most likely somewhere in the dinner's menu will be a *boudin*, which is a black sausage made of congealed pig's blood—and some other things. You needn't eat it if you don't like; there will be plenty else.

There is a *moyenage* chateau here with pepper-box towers and all the ear-marks of the best Renaissance architecture, and there is a legend concerning the horrors of the time when a certain Comtesse de Chateaubriant was first almost starved to death in a dungeon and then cut into pieces by the surgeons upon the orders of her unworthy spouse. So altogether—what with the *boudin* and the drawing and quartering and a church bell that clangs loudly every quarter hour—there is every prospect of pleasant dreams.

It is from Chateaubriant that the chateau

Vendome is better known than the last half-dozen large towns, and is a most interesting place. Hotel accommodation is scant and not remarkable, though good. But the architectural monuments, the flamboyant Gothic church, the Hotel de Ville, and the Chateau Donjon are worth doing, if only by moonlight after dinner, when peasants and blue hussars wander aimlessly.

From Vendome to Chateaudun is forty-one kilometers, with nothing to hold one's speed down save an excessively dangerous *passage à niveau* at Monplaisir, thirteen kilometers from Vendome, and another at Cloyes, a dozen kilometers before arriving at Chateaudun, with its memories of 1870-71.

Chateaudun (Hôtel du Bon Labourer) is a good place for déjeuner or for the night, but Bonneval, fourteen kilometers farther on toward Chartres, is better—for déjeuner at any rate. The Hôtel de France will give you about the best country fare you will get in France—Chickens, veal, crisp salads, asparagus, strawberries and the like. All are in season between May and September; at any rate, they have four or five months of strawberries—such strawberries as are found only in France.

By Vitray-en-Beauce, through the great grain-growing region of France, one arrives at Chartres, thirty kilometers from Bonneval. From Chartres it is plain sailing and easy going to Paris, via either Rambouillet or Ablis. In either case,



Pont Aven



Cotes du Nord



Roscoff

country of Touraine can best be tapped on returning from the Breton tour.

It is seventy-five kilometers to Angers, the southern gateway, where is opened up the whole Loire Valley and the watersheds of the Vienne, the Indre and the Cher, embracing the best of Renaissance chateaux and the "Garden of France."

As Fast as You Please, but Have an Eye on the Gendarme.

The route back to Paris taking in the chateau country is scarcely prolonged two hundred and fifty kilometers, while the direct road via Laval is a trifle less than four hundred.

As a variation, and since after a Breton tour hills may be presumed to have no horrors for an automobilist, another cross-country route to Paris, omitting the chateau country proper, is via Serge, 40 kilometers; Chateau-Gontier, 24; La Flèche, 54; le Lude, 19; Chateau du Loire, 21, and Vendome, 59. It is a most charming and unconventional itinerary, entirely by second and third class roads, but most excellent roads they are, crossed only here and there by routes nationales, but nearly as good; and when one does get a long, silent stretch, with a gentle slope downhill, he may make any speed he likes and no one to say him nay unless he meets with a brace of strolling gendarmes who are everywhere in the most unexpected places—in France. *Méitez vous, alors!*

THE PICTURESQUE COIFFES OF BRITTANY.

via either Versailles or Sceaux, one strikes the terrible *pavé* of suburban Paris twenty kilometers before the capital is finally reached.

If one is going east to Fontainebleau or the Côte d'Or the route from Chartres is via Ablis, Etamps and la Ferté-Alais. If the north, Normandy or the seaport towns in connection with England are the objectives, suburban Paris can be avoided by crossing the Forêt de Rambouillet and through Houdan to Mantes.

To sum up: The roads of Brittany, the main roads, are excellent, but hilly, and so long as one is ready for surprises of sharp ascents and descents, particularly in the towns, for innumerable sabot nails in his pneumatics, for frightened donkeys, geese and peasants, and for gendarmes always looking for trouble the Breton tour is as enjoyable as any in France.

One must not forget that it is six hundred kilometers out and back from Paris or the Seine Valley before one comes to Brittany proper, and that this will take two or three days travelling, going and coming, besides the eight hundred or more kilometers making the Breton circuit. The itinerary is as follows:

Place	Kilometers	Hotels
Versailles	16	
Chartres	73	
Nogent-le-Rotrou	59	Hotel du Dauphin
Le Mans	65	de France

Place.	Kilometers.	Hotel.
Laval	80	de Paris
Vitre	87	des Voyageurs
Fougères	28	St. Jacques
Doj-de-Bretagne	49	de la Grande Maison
Dinan	27	de Bretagne
St. Malo	29	de France et Chateaubriand
Lamballe	43	de France
St. Briec	20	d'Angleterre
Guinamp	32	Grand Hotel de l'Ouest
Detour: Plouha, Palmpoul, Treguler,		Lannion.
Morlaix	54	de l'Europe
St. Jean-du-Dolgt		
Landivisau	23	
Landerneau	16	de l'Univers
Plougastel-Daoulas	11	des Voyageurs
Camaret		
Crozon	35	
Chateaulin	33	de la Grande Maison
Quimper	28	de l'Epée
Detour: Douarnenez, Pont Croix, Pont l'Abbé, Penmarc'h,		
Rosporden		
Concarneau	23	Hotel des Voyageurs
Pont Aven	15	Villa Julia
Quimperie	17	Lion d'Or
Lorient	21	
Hennebont	10	de France
Auray	28	Lion d'Or
Vannes	18	
Rochefort-en-Terre		le Cadre
Redon	61	de la Poste
Vendome	204	du Grand Cerf
Chateaudun	39	Bon Labourer
Bonneval	14	de France
Chartres	30	Duc de Chartres
Paris	88	

Guides and Maps.

- Joanne's "La Bretagne," 7 fr. 50c. Published by Hachette & Cie., Paris.
- Cartes Taride, Nos. 5, 5bis, 8, 9, 1 fr. each. Published by A. Turide, 20 Boulevard St. Denis, Paris.
- Carte Touriste de la France, Nos. 4 and 5, 2 fr. 50c. each. Published by the Touring Club de France, 65 Avenue de la Grande Armée, Paris.
- Carte de l'Etat Major, scale 1-80000, 30c. per sheet. Obtainable in all large towns.
- "Sur-Route" Atlas-Guide, 3 fr. 50c. Published by Hachette & Cie., Paris.
- "Rambles in Normandy" and "Rambles in Brittany," by Francis Miltoun. Published by L. C. Page & Co., Boston.

BAY STATE HELPS AUTOISTS OBSERVE LAW.

BOSTON, June 24.—In order to assist automobilists in observing the law and to provide the local municipal authorities with a uniform method of warning drivers of motor vehicles, the Massachusetts Highway Commission has just adopted a new series of road signs and plans to supply them to local authorities at a low cost. The signs are on iron plates 16 by 24 inches and are enameled in green with white letters similar to the speed signs which have been in use by the commission for a year or more. They are designed to be erected at right angles to the highway at points 150 feet distant from entering roads, cross roads, corners and curves, at which points the law requires that the speed shall not be in excess of eight miles an hour. In the series is another sign designed to be erected 150 feet from the so-called "thickly settled" limits, within which the speed is 12 miles an hour.

Already the commission has had orders for about 125 of these signs by six or eight towns, and as soon as it becomes generally known that they are available it is anticipated that the signs will be much in demand. The commission believes that with these signs in general use there will be much less friction between automobilists and local authorities, for they will enable the tourist to know just what conditions he is approaching, and if he is as familiar with the law as he should be, there will be no excuse for excessive speed. The signs will also tend, it is thought, to do away with the local speed rules, which are the bane of the automobilist, because by using these signs the authorities may in effect reduce the speed of automobiles at the dangerous points on a road without making a regulation covering the entire road.

With the extra appropriation of \$3,000, which the Legislature granted the Massachusetts Highway Commission to put into effect the system of examinations for professional chauffeurs, outlined in THE AUTOMOBILE of May 9, the commission has now established a complete plan for examinations covering Boston and eight of the principal cities of the State. Two men are engaged in this work, and while one remains in Boston for the purpose of examining applicants every weekday, the other makes a circuit of the State each week, holding examinations in Pittsfield, Springfield, Worcester, Fitchburg, New Bedford, Brockton, Lowell and Salem. About fifty applicants are now being examined each week and it has been found that since the examination system was put in force the applicants are much more familiar with the law and the rules of the roads as well as with the management of their machines than they were formerly. Very few now fail on the written test, the majority of failures being on the technical side. At least 75 per cent. of the applicants, however, are now receiving licenses. The new plan is approved by owners and several men who have purchased cars have brought their chauffeurs and cars to the offices of the Highway Commission and have accompanied them through the driving test.

THAT BOULEVARD TO THE WHITE MTS.

PORTSMOUTH, N. H., June 24.—The construction of the Merrimac Valley highway, authorized by the last session of the New Hampshire legislature, and on which work will soon be in progress, will mean a great advance toward the completion of a good boulevard from Boston to the White Mountains. This line, which will be about 65 miles in length, will be a broad, macadamized road, connecting with the Massachusetts State highway at Tyngsboro and extending northward to Lake Winnepesaukee. It will run through the cities of Nashua, Manchester, Concord, Franklin, and Laconia, in the order named. The expenses for the construction of the road will be jointly defrayed by the State and by the towns and cities through which it will pass.

Automobile "scorching" will hereafter be decidedly unpopular in this neighborhood, as the police have received instructions to arrest all indulging in the practice, or who otherwise fail to comply with the police regulations governing the speed of automobiles, the rate being eight miles an hour.



"GENDARMES ARE EVERYWHERE."]





EXPANSE NEAR BETHPAGE SHOWING PARKWAY STAKED.



BAD WASHOUT MADE CAREFUL DRIVING NECESSARY.

OVER THE LONG ISLAND PARKWAY COURSE

By H. A. GRANT.

IT was a natural bit of curiosity that prompted us to make a run over the Long Island Parkway—that is to be. At present it is a cross-country scramble over widely diversified country, that frequently calls for more acrobatic tricks on the part of the auto than its maker ever intended it to perform. On the great Hempstead Plains, the entrance-hall to the Parkway, there is but a narrow track which has never received much of the tender care of man, but which in a few brief months will be transformed into a broad, rolling highway, where the only speed limit will be that of the car. As far as the eye can see is barren, open country, that breeds a longing to rush away into space at fantastic speed.

Over the broad, grassy plains near Bethpage, as devoid of life as any spot in the far West, except for the presence of the Long Island Railroad, the ground had been staked out for the proposed course, and we stopped the car to get a picture of the very spot on which the Parkway race course will be built. It is an ideal spot for speed, with wide-open land losing itself on the horizon. In its present natural condition to rush over its surface—if that were possible—would fail to produce any sensation of rapid travel, so vast is the expanse; but when a ribbon of road has been rolled out nothing will have been taken from the vastness of the scene and an element will have been added permitting the human mind to grasp the rate at which space is being annihilated.

Further eastward there is more variety—brushes, through wild woodland, with a track so narrow that the undergrowth swishes along the sides of the car, and at times a springy bough strikes you

in the face with a vigorous smack. This will be one of the spots where the traveler will linger to breathe in the beauties of the land. At times there are vistas of sea and land that hold you in contemplation; then again there is bad going, with dangerous washouts that call for undivided attention to keep the car right side up. At present it is too strenuous an occupation, crossing over the Long Island Parkway; but when it has been rolled and hammered and pummeled into the highway it is intended to be, there will be a variety of sensations. At times the only fascination will be to hold the wheel of a high-powered car; at other moments you will be content to jog along on a little single-cylinder trailer.

The residents along the route all seem enthusiastic over the proposed highway; and well they may, for it is the only thing that can make a residential section of an otherwise forsaken country. To be able, almost at the gates of the great city, to find an outlet where dirt and noise can be left behind, and where the fingers can coax the throttle without the eye being in mortal terror of alighting on a blue uniform, would be sufficient pleasure for the automobilist, even if there were no beauty spots.

Certainly this parkway, the first of its kind in the world—for, although others have talked of special motor roads, it has been left to young America to set the lead—will be the precursor of a good-roads movement over the entire country. They will not all be parkways, naturally, but they will all benefit by the example of the perfect highway, on which the skilled engineer to-day and the sturdy laborer to-morrow are to work with might and main.

ABOLISHING CONNECTICUT'S TOLL BRIDGES.

HARTFORD, CONN., June 24.—There is now pending before the Connecticut State legislature a bill providing for the elimination of tolls of the bridges which cross the Connecticut river at Warehouse Point and Thompsonville. The Hon. H. R. Coffin, representative from the town of Windsor Locks, in the house of representatives, is doing his utmost to bring about the passage of the bill. Mr. Coffin has occasion to cross these bridges several times a day. As he uses a 45-horsepower seven-passenger touring car, the tax charges therefor are abominable.

Fred Wright, of the Electric Vehicle Company's test crew, recently crossed the river at Windsor Locks in a 24-horsepower Columbia and was taxed 35 cents for doing so. Wright was so disgusted that he threatened to climb Church street hill on the high, despite the protests of his companion, a mechanic from the factory. Subsequently he made good his threat.

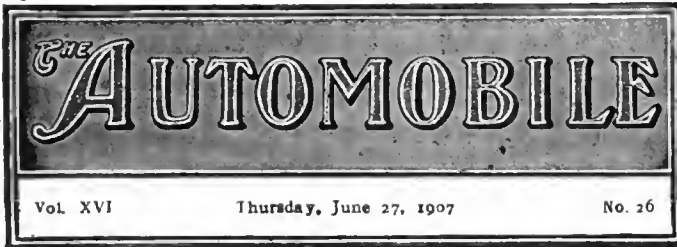
Should this bill pass the legislature, autoists in general will rejoice. These taxes are regarded as relics of the past and there is small reason for their existence. If concerted effort amounts to anything, the bill should pass.

GOOD ROADS NEWS FROM THE FAR WEST.

TACOMA, WASH., June 20.—N. L. Taylor is completing the work of outlining a system of boulevards for this city. The general scheme provides for beginning at the north end of Yakima avenue, thence to Point Defiance Park, around the park along the bluff, overlooking the Sound, and along the ridge of the Narrows to the city limits. Picturesque Old Town is brought into the system. A southern link will run from the south end of Tacoma avenue to McKinley Park. Two other links run to other sections of the city. The estimated cost is \$1,500,000.

State-aid Road Approved for King County.

SEATTLE, WASH., June 20.—The State Board of Highway Commissioners has approved plans for a State-aid road in King county and has elected Surveyor Valentine as superintendent of construction. The estimated cost is \$37,832.57, of which State and county bear an equal share. The road begins at the Riverton drawbridge and continues to Renton Junction, a distance of 15,487 feet. It will be a continuation of the macadam road from the limits of Georgetown to Riverton.



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Unparalleled Success of the Sealed Bonnet Contest. Never has the outcome so completely confounded the prophets as was the case in the jocularly dubbed "millinery race" of the Automobile Club of America. When the subject was first broached there was a general howl of disapproval. "Why make it four days when two will be more than enough to finish even the best of them?" said these dissenters. But after the first day's successful completion of the scheduled run by every one of the forty-seven starters, tire trouble alone having been the only thing to mar the event, and of that there was remarkably little, one and all changed their tune completely. "Give us something easy," they said. "We could keep this up for a week and still be going some," was the universal opinion.

Nothing proved so conclusively that lifting the bonnet to tinker here and adjust there is something that is the outgrowth of habit rather than the call of necessity. That more than 80 per cent. of all the cars that started finished with clean scores—and they could finish in no other way under the rules of the contest—is most significant. It proves beyond a doubt the extremely high factor of reliability that now characterizes the modern automobile, and it also means that the Automobile Club of America will have to go into the wholesale jewelry business in order to supply the demand for the cups that are the reward of a perfect score. Equally remarkable is the trivial nature of the few mishaps that put the unfortunate few out of the running. All told, they would not suffice to put one car out for more than half an hour. With a single exception, and that car gave audible signs of being a cripple right at the start, the troubles encountered were of the most insignificant kind, a broken valve spring prob-

ably being the most serious on record, while parted battery wires and the necessity for a little steering gear adjustment which eliminated two cars, show how very slight was the attention required. No contest ever held served to demonstrate the reliability of the up-to-date automobile so tellingly, as well as how very difficult it is to devise some form of competition that will serve to eliminate many cars, even though the test be prolonged.



What Will Be the Next Form of Elimination?

As the direct outcome of the great success that has marked the running of the Automobile Club of America's Sealed Bonnet Contest, there has immediately arisen the query, What next? The rules of the latter were considered so severe at first that it was hardly thought possible that more than a few would survive—and that more by good luck than good management or inherent merit on the part of the car itself, as a broken porcelain spark plug, or a parted battery connection, certainly is no disparagement to a car. It did not take long to show that 600 to 700 miles would never prove a conclusive test under what had in a few hours' running become magically transformed into the most liberal of rules, instead of restrictions that spelled failure for the many.

It is quite evident that the modern stock car will run a long distance at fifteen miles an hour, or a much higher rate of speed, without the slightest necessity for adjustment or stoppage other than that called for by needed replenishments of fuel, oil and water, or those occasioned by tire misfortunes. Taking into account the performances of the many cars in last week's contest and their almost uniform success, it would seem that nothing short of a restricted fuel allowance, in addition to the conditions already imposed, would suffice to cause a greater number to fall by the wayside. Reliability has been developed to such an extent that its relative importance has been greatly diminished; the same is true of endurance. It may safely be said that the modern car possesses both these cardinal virtues in high degree, whatever its make, from all of which it would seem that the time has come to couple with them the matter of economy in all future contests, as it is to the "all around" car that the palm should rightly be awarded.



Conflict of the Sales and Engineering Departments.

In every manufacturing business there are two forces constantly at work, and unfortunately they do not always work in unison toward the same end. They are represented by the manufacturing and the selling interests of the concern and in no other industry have they clashed to such an extent as is true of automobile building. Your average automobile manufacturer is a man of ideas and no mean engineering skill, or, if not, he surrounds himself with the best talent of the kind. In either case the result is the same. The car should be representative of the latest advances in design and, more than that, it should reflect the skill of its designer—it should bristle with original features, resolves the engineer, who goes ahead along that line.

"But," says the selling force, "that is not what the public wants. Cut them out and give us something that sells," and the matter-of-fact sales manager, who may not know the exhaust from the inlet, throws cold water on brilliant engineering designs and outlines his conception of the selling car. The war is then on. It is a familiar story to those in the trade, and its outcome depends on which side gives in first. Needless to add, engineering failures have brought the most thoroughly organized and equipped selling departments down in more than one instance. The first half decade of automobile building in this country was marked by a broad trail of them, and only the financial strength of some of the concerns involved averted total ruin. The public is an ass, no doubt, but while it is all very well to build cars after a theory, they must be sold, and no one knows what will sell better than the sales manager. There is another side to it, of course—the demand on the engineering department for new talking points each season—but that is another story.

HARRY FOSDICK REMOVES TO BROADWAY.

Right upon the heels of the announcement that E. R. Hollander had severed his connection with the Hol-Tan Company, which he was instrumental in organizing, came one of even greater import to the fraternity at large, and that was to the effect that Harry Fosdick would again be seen on New York's automobile row, this time as the vice-president of the Hol-Tan Company. Mr. Fosdick has already tendered his resignation as president of the Harry Fosdick Company of Boston, which handles the Thomas and Fiat cars in that city, though it is understood that he will still retain his interest in the Boston firm. His resignation takes effect July 1 and he will be succeeded by Alfred N. Robbins.



HARRY FOSDICK.

Mr. Fosdick has been closely identified with the business of selling automobiles ever since there have been such things. He discovered the Hub when its sole asset in the shape of an automobile representation consisted of two small stores which handled steamers, and he was one of the two. With the decline of the little "teakettles" in popular favor he became manager of the Winton branch house and he was not long in making the fact known that there was a live man at the head of the Winton interests in the down-east seat of learning and culture. He blazed a Winton trail all over New England. For the past two years he has been president of the company that bears his name and has been largely instrumental in fostering automobile interests in Boston generally, being treasurer of the Boston Automobile Dealers' Association, a member of the touring committee of the Bay State Automobile Association, and a member of this year's show committee, which did such good work.

STRENUOUS LIFE FOR THE FOREIGNERS.

Foreign machines are likely to appear more frequently in American touring and other contests than they have done in the past. At a recent meeting of the Importers' Automobile Salon it was unanimously decided to appoint a committee of four, consisting of Paul Lacroix (Renault), Gaston R. Rheims (C. G. V.), Percy Owen (Biachi), and G. M. MacWilliams (Darracq) to be called the Importers' Trade Contests Committee, to make inquiries and ascertain what contests would tend to elevate the sport and bring out reliable and desirable qualities of cars. G. M. MacWilliams, the originator of the movement, declared to THE AUTOMOBILE representative that he had proposed this committee in order that there should be more adequate representation of the foreign element in American contests. "The committee," he stated, "will examine the conditions of all tests, and if they approve of them will recommend members of the Importers' Salon to enter cars. Although they will be ready to offer suggestions to organizing associations, it is not their intention to conduct any competitions on their own behalf. One or two members ridiculed the notion of foreign cars entering competitions, but the majority declared that in the future they would enter all tests approved by the Trade Contests Committee. As an example of the influence of the movement, had this step been taken a few weeks earlier there would have been, instead of two Darracqs and a Rolls-Royce in the Sealed Bonnet Contest, a group of sixteen or twenty foreign machines."

NEW YORK STATE ASSOCIATION TO MEET HERE.

For the purpose of considering amendments to its constitution, as well as to consider such other business as may come before it, the Board of Directors of the New York State Automobile Association will hold a meeting at the offices of the American Automobile Association, 437 Fifth avenue, New York City, at noon on Friday, June 28.

NEW DEVELOPMENTS IN SHOW SITUATION.

Recently S. A. Miles, manager of the Chicago show, which is to be held from November 30 to December 7 this year, sent out an announcement that the allotments of space for the two Chicago shows—that is, the exhibit of pleasure vehicles and accessories in the Coliseum and First Regiment Armory and that of commercial vehicles at the Seventh Regiment Armory—would be made on July 1, and further, that applications, in order to be considered in the first allotment, would have to be in hand by June 29, application blanks and diagrams being forwarded with the announcement. All of which showed that the National Association and Mr. Miles were up betimes on show business, as it still lacks five months of the Chicago dates.

Whether this announcement, made in the regular course of routine business, had any bearing upon later developments in the show situation, that have literally sprung out of the ground as it were, is a question. But that developments of a rather revolutionary nature are pending seems to be assured. It is a matter of common surmise that the National Association of Automobile Manufacturers, under whose auspices the Chicago show is held, and the Association of Licensed Automobile Manufacturers, the upholders of the Selden patent, are closely affiliated, and there is a feeling in the camp of the American Motor Car Manufacturers' Association that the latter element has become dominant, with the result that independent makers are to be discriminated against. There will accordingly be a meeting of the latter Association in New York City to-day, June 27, to decide whether to exhibit at Chicago this year or not, and it is thought that any action taken will be followed by the Motor and Accessory Manufacturers, Inc. As the members of these two associations have always formed a very substantial part of the Windy City exhibit, their defection is a matter of some moment. Whether the question of holding an entirely independent show in the West, as has been the case in New York, will be brought up at the meeting, remains to be seen, but judging from the present outlook there will be a break.

BIG ENTRY FOR THE POINT BREEZE 24-HOUR.

PHILADELPHIA, June 24.—Next Friday and Saturday's twice-round-the-clock event at Point Breeze promises to be the most important event of the kind, as regards the number of entries, which has yet been held in this country. The Quaker City Motor Club, which is managing the affair, will spend considerable money getting the track in shape, with a view of preventing its wearing into ruts, as it did in last month's race. Six thousand gallons of crude oil will be worked into the track this week and heavy rollers will be at work from dawn to dark pounding the stubborn clay into a solid level surface. Although the entries have not yet closed, there are already two Lozier, two Wayne, two Frayer-Miller, and the same number of Dragon cars listed to start, besides one each of the Mitchell, Darracq, Pennsylvania, American Mercedes, Stearns and Oldsmobile. At least one more entry is expected and possibly two, and if so Starter Wayne Davis will be compelled to line up the field in two rows, as the track is not sufficiently wide to accommodate all of them abreast.

GOLD CUP TOUR DEPARTURE DELAYED.

Latest despatches from Georges Dupuy, manager of the Gold Cup tour, state that after running through the whole of France, north of Spain, and a large portion of Italy, the Stearns and its occupants are at Rome, preparing to strike northward into Austria and Germany for the final stages of the journey.

Owing to the late start and various delays on the road the pilot car is far behind the schedule. "The machine is pulling splendidly," says the Gold Cup pioneer, "but 200 kilometers a day for 50 days in succession is a terrible strain on the driver." In a few days the party will sail for New York, arriving here early in July, when a definite announcement will immediately be made on the date of departure of the main body.

JUNETIME DOINGS OF THE AUTO CLUBS

Worcester Holds Successful Decorative Parade.

WORCESTER, MASS., June 24.—This city had a four-days old home carnival last week, and Thursday afternoon the feature of the closing day was an automobile parade. This parade was originally planned by the carnival management to be held in connection with a coaching parade and show of workhorses. Members of Worcester Automobile Club showed the fallacy of this and succeeded in getting the autos into a separate division,



A BEAUTY-LADEN PRIZE-WINNING THOMAS FLYER.

and with prefatory policemen mounted on motorcycles, and the band on a motor truck, were able to roll along at a fair rate of speed through the business section of the city and past City Hall, where Mayor John T. Duggan reviewed it.

There were nearly fifty cars, mostly decorated, in the line. The largest cup offered was awarded to John S. Harrington, who put his Thomas Flyer into the competition decorated with pink and white and pretty girls. A cup for the best equipped touring car, occupants and their costumes to be inclined in the make-up of the car, went to a Rainier car from the Buck-Price Co., Boston, Fred Smith driving. A cup for the best decorated runabout went to Oakley S. Walker, who with his daughter, Miss Dorothy Waiker, traveled in a Ford runabout with tasteful decorations. The committee of award were George A. Campbell, P. B. Talbott and Dr. Roy M. Garfield.

Worcester Automobile Club members are planning for summer runs. Among them Col. Fergus A. Easton will take his Stevens-Duryea to the White Mountains, thence across New Hampshire and Vermont to Montreal, thence to Toronto, Kingston and Hamilton and home by way of Niagara Falls and across New York State. C. C. Milton and J. E. Fuller are planning a trip through Vermont to Ticonderoga and the Lake George region, and home by way of Saratoga and the Berkshires. Lyman F. Gordon is planning to initiate a new Packard car by accepting delivery at the factory at Detroit and running it home.

Syracuse Autoists Enjoy an Era of Prosperity.

SYRACUSE, N. Y., June 25.—Forthy-three members were added to the Automobile Club of Syracuse at its most recent meeting, the largest number elected at any one time since the club was organized. The club now has a membership of 155. Secretary Forman W. Wilkinson was requested to communicate with the authorities in an effort to have the highway between Fayetteville and Oneida placed in better condition, as this route is a favorite one with automobilists and is in sad need of attention. It was decided to issue a folder for general distribution calling attention to the objects of the club and what has already been accomplished.

Comment was made upon the large danger signs placed at the top of the Tully hill, and it was announced that information had been secured by President H. W. Smith and others for the placing in Onondaga County of one hundred additional route and danger signs which have been ordered. As many of the roads in this section of the State abound in bad spots, these signs will be much appreciated.

A motion was passed rescinding a resolution adopted at a former meeting requesting Senator Horace White to dispose of his stock in one of the toll road companies. It was found that the club had been misinformed and that Senator White did not own any stock in a toll road. A letter of apology was sent some time ago.

Georgian Automobilists Organize at Atlanta.

ATLANTA, GA., June 24.—For the purpose of having representation with the American Automobile Association, a meeting was held last week in the Piedmont Hotel by owners of machines in Atlanta and the Atlanta Automobile and Goods Roads Association was organized. The new organization is a business one and has for its purpose the securing of proper legislation for the protection of auto owners, the betterment of the roads and advantages in accident policies and machine insurance.

The meeting was well attended and the following officers were elected: President, F. L. Seeley; vice-presidents, E. H. Inman, R. F. Shedden and J. P. Stevens; secretary, E. H. Crocker; treasurer, Asa G. Candler, Jr. All owners of autos are eligible and the dues are two dollars a year.

L. I. A. C. Becomes Joint Promoter of Brighton Beach Race.

The Long Island Automobile Club has become associated with the United States Motor Racing Association in the running of the twenty-four-hour Automobile Endurance Derby, to be held at Brighton Beach track on August 9-10. The well-known Brooklyn organization will appoint all the officials for the contest and otherwise generally supervise it. R. G. Kelsey, chairman of the contest committee of the Long Island club, is taking a very active part in arranging the details. Plans have been made to include a fifty and a hundred mile race in the Brighton Beach program, holding these events in the afternoon and early evening of August 9, starting the twenty-four-hour race later the same day.

**TAKE RIGHT TURN FOR
SYRACUSE 23 M**
ERECTED BY
THE AUTOMOBILE CLUB OF SYRACUSE

DANGER →
ERECTED BY
THE AUTOMOBILE CLUB OF SYRACUSE

**DANGEROUS HILL
DRIVE WITH CARE**
ERECTED BY
THE AUTOMOBILE CLUB OF SYRACUSE

TYPES OF THE DANGER AND DIRECTION SIGNS WHICH ARE BEING ERECTED BY THE AUTOMOBILE CLUB OF SYRACUSE.



GAYLY DECORATED MAXWELL-BRISCOE FACTORY BUILDINGS AND THE CROWD THAT WITNESSED THE CEREMONY.

NEW MAXWELL PLANT DEDICATED.

NEWCASTLE, IND., June 22.—This is the day that the famous discovery of Newcastle by Benjamin Briscoe is being celebrated. Of course, Newcastle has been here for some time on the same spot, but no one in the automobile industry knew anything about it until the far-seeing Briscoe put the inducements of Muncie, Marion, South Bend, Elkhart and Kokomo behind him and struck out on his own line. Newcastle had a good deal to do with it, too, because while the others were haggling over terms its progressive citizens formed the Industrial Company and landed the Maxwell-Briscoe Motor Company in its midst. Consequently Newcastle is celebrating to-day and a right royal celebration it is, too. The occasion is the laying of the cornerstone of the immense new plant where Maxwells are to be turned out, but unlike most of the formal functions of this kind, progress has not been delayed on that account and the big buildings are more than half up.

To say that Newcastle celebrated is to put it mildly indeed. Every one of the 5,000 inhabitants of this little "city of roses" was there and as many more from the surrounding country. Business was entirely suspended and so far as this particular

portion of the United States was concerned it might just as well have been a national holiday. As a prelude to the formal ceremonies at the new plant there was one of the most ambitious automobile parades that Indiana has ever seen. Carl J. Fisher, the Indiana Maxwell agent, drove here at the head of a long procession of Maxwells, and his line was considerably swelled by the local owners, so that there was a string of more than a hundred cars. These served to carry the officers of the Maxwell-Briscoe Motor Company, Vice-President Fairbanks and the other guests of honor, who occupied six touring cars, while the remainder were given over to the members of the many fraternal organizations who helped to swell the crowd, which was estimated at over 10,000 people. The ceremonies were opened by an address of welcome by E. H. Bundy, one of the town's leading citizens, who was followed by Vice-President Fairbanks, the principal speaker of the day. It is evident that politics have not so engrossed the Vice-President's attention but that he is keenly alive to the immense future of the automobile industry, as well as its ultimate trend toward the production of moderate-priced cars on a vast scale. Naturally he drew a roseate picture of the great growth and promising future that lay before Newcastle owing to its en-



MR. MAXWELL MAKES AN ADDRESS TO THE MULTITUDE.



VICE-PRESIDENT FAIRBANKS, THE MAYOR, AND MR. BRISCOE.



VICE-PRESIDENT FAIRBANKS LAYING THE CORNERSTONE.

try as a factor in the automobile industry, and incidentally he reviewed the rapid strides made by the latter.

To put it in the vernacular, the committee on arrangements knew its business, for an address by C. S. Henley on "Greater Newcastle" and another by M. E. Forkner concluded the speech-making. Next to the actual laying of the cornerstone the great feature of the day was to be a banquet, but the attendance so far exceeded all estimates that it was necessary to make the big dinner a continuous performance. In fact, there were three of them, the first two installments being held at the Bundy Hotel two hours apart, and the other at the Country Club later in the evening.

The story of how Newcastle came to get the Maxwell-Briscoe plant is an interesting one. The terms agreed upon involved a site valued at approximately \$30,000 and a bonus of \$90,000, to be applied to the construction of the plant. In return for this the company agreed to establish a factory that would employ at least 1,200 men and keep it in operation until \$2,000,000 in wages had been paid. But raising a bonus of \$120,000 in a town of 5,000 people is no small task, and the manner in which it was successfully accomplished may well be patterned after by growing towns which find themselves in a similar position. A tract of land was purchased, plotted off into building lots, and on November 13, 1906, the town had a huge block of carefully marked out lots as its sole asset to induce the establishment there of what will probably be the largest automobile manufacturing plant in the country. That was the day the sale began, and in just four days there was such a demand for the lots that the contract was ratified by the directors of the Maxwell-Briscoe Motor Company and received its final validation in the shape of the signature of the Industrial Company just one week later. No time was lost in beginning construction, the first contracts being awarded on December 22. Work has progressed so rapidly since then that it is expected the main factory building will be complete in time to turn out some of the 1908 Maxwells.

As it is a typical example of the truly vast scale upon which American automobile plants are now being built, some statistics regarding its size will not be as dry as such figures usually are. The main building is of brick and concrete construction, involving the use of 1,000 tons of steel, and measures 722 by 316 feet. The manner in which things have been rushed on is evidenced by the fact that it is almost ready for the roof. In addition to this, the present plans include a 50 by 75 foot office building and an independent power plant housed in a special structure measuring 200 by 50 feet, and a 200 by 60 foot building for testing. These constitute the nucleus around which the plant will spread until it eventually covers the entire sixty-five acres of ground available, including a half-mile track for trying out cars. Sev-

eral carloads of machinery have already arrived here to form part of the equipment and will shortly be installed, it being expected that operations will begin early in the fall. That the sponsors of the new plant expect to greatly exceed the provisions of their contract calling for the employment of 1,200 men is shown by the fact that the washroom equipment of the main building includes 2,026 individual lockers, and it is said that fully 1,500 employees will be put to work right from the start. It is understood that at first only the Model H Maxwells will be built here, but as soon as it is running full blast the new plant is expected to have an annual capacity of 5,000 complete cars, which is somewhat of an increase over the total output of 500 cars turned out in 1905 and 1906 by this company.

SCHEDULES SHOW LARGE NOMINAL ASSETS.

Schedules in bankruptcy of the firm of Smith & Mabley, incorporated, which recently went to the wall, have just been made public. They show total liabilities of \$296,188, of which \$90,000 are contingent, consisting of three damage suits for personal injuries; the nominal assets total \$513,661 and the available assets \$167,241. The last named consist of automobiles, supplies, accessories; outstanding accounts to the sum of \$64,578; equity in accounts assigned, \$2,614; cash, \$557; unexpired insurance, \$1,600; 360 shares of the stock of the Smith & Mabley Manufacturing Company of a par value of \$36,000 and pledged for a loan of \$25,000; plant and power account, good will, etc., carried on the books as representing \$346,420, and the office furniture and fittings at 1765 Broadway inventoried at \$61,892.

The liabilities consist of the claims of some 210 creditors, some of the chief of whom are Boessneck Broessel, \$116,200, partly secured; New Amsterdam National Bank, \$24,000; Riverside Bank, \$165,500; W. H. Hull & Company, Bridgeport, Conn., \$6,117; Bridgeport Vehicle Company, \$5,999; Harry Monkhouse, Rome, N. Y., \$3,638; Standard Oil Company, \$2,698; Harburg Tire Company, now the Crescent Auto Parts Company, \$1,714, and the New York Edison Company, \$1,419. Of the actual liabilities but \$25,562 are secured.

CARTERCAR RUNABOUT AS A FIRE FIGHTER.

Detroit has shown its appreciation of the advantages of the automobile in general as an aid to fire-fighting, and of the Cartercar in particular for this rôle, by purchasing a runabout of the latter make for the exclusive use of Master Mechanic Bresnahan of the city's fire department. This is the second car purchased by the municipal authorities for this purpose from the Motor Car Company of Detroit, the first Cartercar having been bought last year for the use of Superintendent Gascoigne, of the fire alarm system, for his official use.



MASTER MECHANIC BRESNAHAN'S NEW CARTERCAR.

Michigan's Latest Production

The Menges

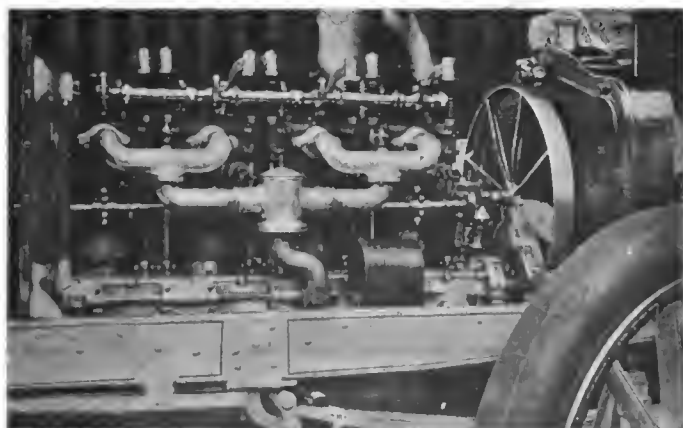


DESIGNER AND BUILDER, A. C. MENGES, IS AT THE WHEEL, WITH CHARLES CHILDS, GAS ENGINE SPECIALIST, BESIDE HIM.

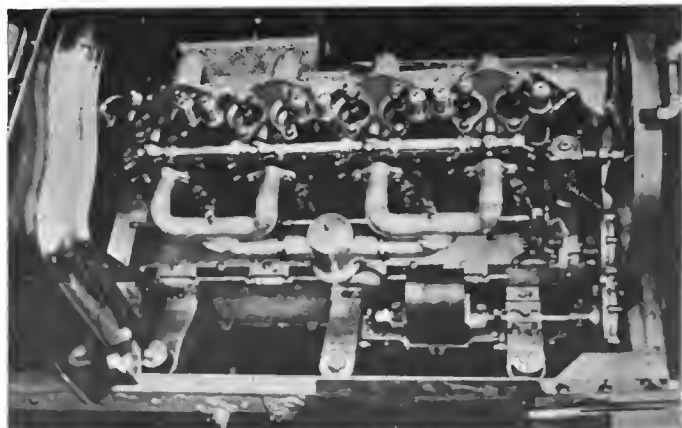
GRAND RAPIDS, MICH., June 24.—Michigan's furniture city has again come to the fore with a novel automobile production which bids fair to make her distinguished in the industry if the car is built here for the market. A. C. Menges, who has long been identified with the technical side of automobile building, is the sponsor of the new production, and those who have been familiar with his work in the past along this line will not be surprised to note the numerous original features which mark his latest success. The power plant consists of a four-cylinder vertical water-cooled motor. With the exception of this and the fact that it is water-cooled, its adherence to standard practice does not extend any further. Cylinders are cast independently and are perfectly smooth outside, as both valves are located in the head, the valve system being the most distinctive feature of the motor. The valve casings are ground and seated in a tapered housing so as to require no packing. Though located in the head, no rocker arms are used to operate the valves, the springs being set to one side, while the valve lifters, cams and camshaft are housed separately from the crankcase and run in a bath of oil. The exhaust cams are fixed to the camshaft and the operation of this part of the motor is substantially that recognized by standard practice. The intake cams, however, are movable on their supporting shaft at the will of the operator and are called bypass cams, constituting the most important feature of the motor control. By the use of this arrangement each cylinder may be throttled independently; it is, in brief, a system of variable

inlet-valve control by means of which the quantity of the charge inspired is regulated, this in turn altering the compression in the cylinders and in consequence the amount of power developed. These especially constructed cams are supported on a sliding shaft, and as at present designed their control furnishes a means of giving the engine an initial compression ranging from one pound to eighty pounds to the square inch and a horsepower output of from five to ninety horsepower, the fuel consumption naturally being in accordance, the cylinder dimensions being 6 1-2 inch bore by a 5 7-8 inch stroke.

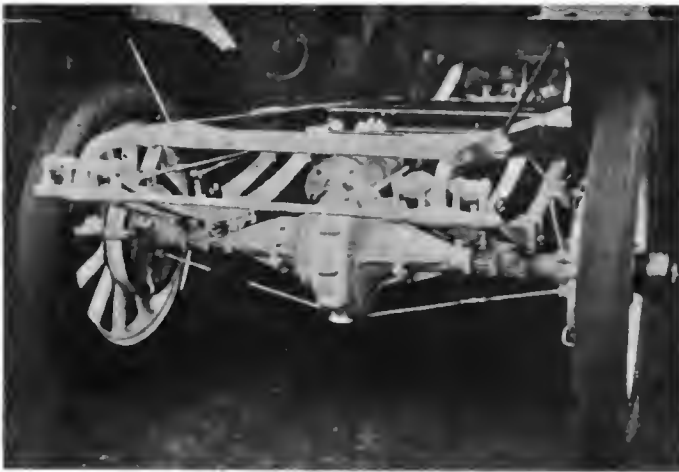
Any one who knows Menges would be safe in stating that a motor which was the work of his hand and brain would incorporate self-starting as one of its distinctive features, and this is the case here. But this is something quite different than has been attempted in the past. It consists of an electric motor which turns the engine over through the medium of a pinion and ratchet. Presumably, the motor is wound for a low voltage and is designed to take its current from the accumulators, though no details are as yet forthcoming on this point. Another rather distinctive feature is to be found in the ignition. Both low and high-tension systems are used, employing the same spark plugs interchangeably, while the current is furnished by a magneto which is driven by a short independent shaft at the right hand side of the motor. A Schebler carbureter constitutes this essential of the motor, though the latter is distinguished by the use of a somewhat original form of intake manifold, as will be seen



RIGHT SIDE OF MOTOR SHOWING MECHANISM.



TOP VIEW OF MOTOR SHOWING OPERATIVE PARTS.



REAR VIEW OF CHASSIS SHOWING DIFFERENTIAL.

from the accompanying illustration showing the power plant as viewed from this side. Another photograph, showing it in about half-plan view, gives some idea both of the motor and its constructional details as well as its odd form of suspension, the latter being patterned after the system of hanging locomotive engines. That is, it rests upon springs with six independent points of support. It is claimed for this that no amount of disalignment of the different wheels in passing over obstructions can cause the frame to spring or the transmission to bind. The continuous circulating system of lubrication that is coming to be more and more favored by designers has been adopted. The oil is pumped out of the base of the engine, one lead sufficing to carry it to all the important bearings, this naturally being supplemented by the splashing of the supply in the crankcase; the oil supply is filtered every time it passes through the pump, so that practically fresh oil is brought into contact with the wearing parts at all times. The fan, water pump and oil pump are all positively driven through bevel gearing.

The first step in the transmission of the power consists of an internal expanding clutch encased with and forming part of the flywheel. From this a long propeller shaft extends to the gear set, which is located on the rear axle and is housed in the same casing as the differential and drive. This is known as the Pleukharp transmission, the mounting and external appearance of which are well illustrated by the rear view of the chassis. This gear set is distinguished by the fact that all the pinions are not alone constantly in mesh, but that on all the speeds, including the reverse, the drive is direct—an arrangement for which high efficiency is claimed. There can be no clashing in making gear changes, and it is not necessary to disengage the clutch to drop from high into low speed, as this can be done at any speed without noise or jar.

The foundation of the chassis consists of channel section pressed steel frame of the standard type, but the suspension is distinguished by the use of four semi-elliptic springs, the location and mounting of which are made plain in the illustration showing the rear axle unit already referred to. These are hung on each side of the frame and the use of four permits of the employment of a much lighter spring, thus giving greater resiliency. Forward the suspension is of the standard type, using semi-elliptic flat springs. This is also true of the brake system which consists of a set of internal expanding and external contracting brakes centered on drums on the rear hubs. The wheelbase is 123 inches and the gage standard 36 by 4 1-2 inch wheels being employed, while detachable tires of this size are used on front and rear. The front axle is a one-piece nickel-steel I-beam forging. The steering gear is of the worm-and-sector type. As shown by the photograph at the head of the page, an attractive type of straight line body with ample sized mud guards has been fitted. A. C. Menges, the designer and builder of the car, is shown at the wheel in this picture with Charles Childs, an expert gas engine man, sitting at his left. Control is by means

of the usual spark and gas levers mounted on a stationary quadrant over the steering wheel.

The four-cylinder car above described is designed to sell at \$6,000, and several of them are now in course of construction. It is the intention of Mr. Menges to head a company which he will shortly organize to manufacture the machines, his plans also contemplating the construction of a six-cylinder car to sell at \$2,000. Inducements are piling in upon him to establish the proposed factory in various cities of this State, but no action has been taken on this as yet.

QUAKER CITY'S AUTO TRANSIT CO. WINNING.

PHILADELPHIA, June 24.—After repeated rebuffs the Philadelphia Auto Transit Company seems to be in a fair way of attaining its long-sought ends. On Thursday last there was introduced in Councils an ordinance framed to meet the objections of Mayor Reyburn who had vetoed the last measure passed by Councils on the ground that it was "too general." In view of the numerous lemons which have been handed the Auto Transit people in the past, there is a disposition manifest among the municipal solons to give the new bill the right of way, and it promises to go through a-humming under suspension of the rules.

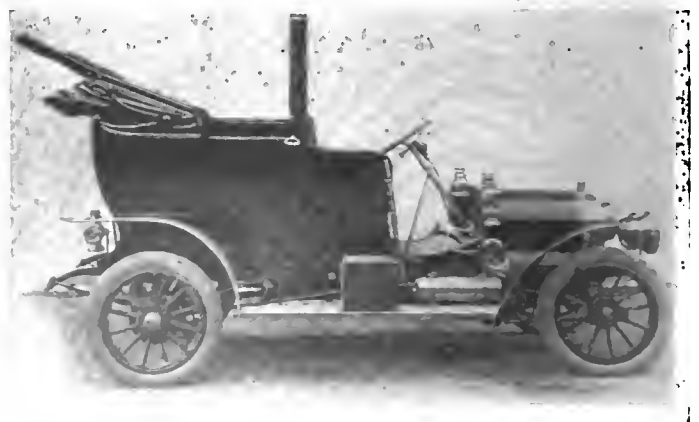
At any rate, the company is making preparations to inaugurate its first service—the Broad and Diamond streets line—on July 15, the day of the opening of the monster Elks convention here. Meanwhile work is being rushed on the new power house and garage at Thirty-first and Dauphin streets. Four steam turbines of 150 horsepower each will furnish power for the dynamos. Twenty double-deckers are completed, ready for the opening of the line, and thirty more are under way.

COLUMBIA INAUGURATES SUMMER SCHOOL.

Though it has been customary to hold a summer session at Columbia in a number of branches, courses in civil and mechanical engineering will be taken up for the first time this year, the subjects including Gas Engines, Hydraulics, Structures, Concrete Steel and Experimental Engineering, the principal object being to meet a demand from instructors in engineering schools and technical graduates who desire to keep pace with the progress of recent years in these branches.

STODDARD-DAYTON PRODUCES TAXIMETER CAB.

American gasoline taximeter cabs, so plentiful on paper, so rare in material form, have received another member to their thin ranks in the shape of a unit from the Stoddard-Dayton factory at Dayton, O. The Stoddard-Dayton, a photograph of which is given, is ready for shipment and will almost immediately be seen in active service. In general design it follows the lines of the most successful European taximeter cabs, with the power plant forward, shaft drive and an elegant landaulet body which can be opened or closed at will.



STODDARD-DAYTON TAXIMETER CAB READY FOR USE.

VOLUME III., OFFICIAL BLUE BOOK.

The map on this page is a fac-simile reproduction of the double-page map of Pennsylvania from Volume III. of the Official Automobile Blue Book, published this week by the Class Journal Company, publishers of THE AUTOMOBILE. With Volume I covering New York State and Canada, with extension routes into the Middle West, and Volume II covering New England, with extension routes into the Provinces, it completes the 1907 series of the national touring guide. The entire work includes over 800 routes, describing in the aggregate over 50,000 miles of American roads, with route maps the greater part of the way and local diagrams showing the entrances and exits for nearly all the cities and the most important towns.

Special interest attaches to the Pennsylvania map from the fact that for the first time the State has been taken up as a whole and charted out comprehensively for the guidance of the automobile tourist. Pennsylvania has not been in the past, and is not now, a good touring State throughout; but it has some of the best runs in the United States, particularly in the Eastern part. Moreover, its roads, like its railways, are important links between the East and the West. This is exemplified in the 1907 Glidden Tour, which is coming East from Columbus, Ohio, by way of Pittsburg, Greenburg, Bedford and Chambersburg; thence southward to Baltimore, returning into Pennsylvania again for the final run to Philadelphia and New York.

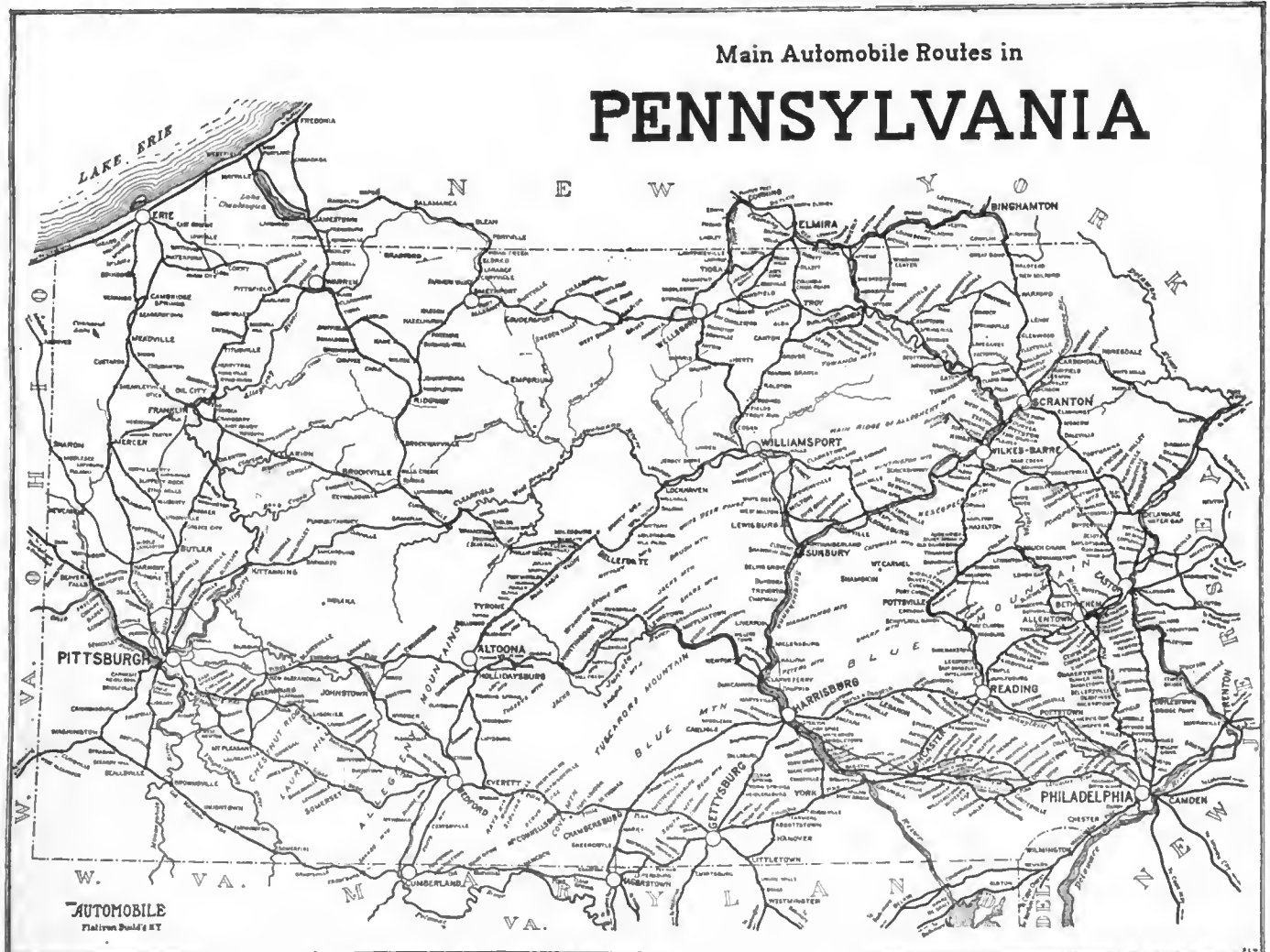
The average of Pennsylvania roads leaves something to be desired; also Pennsylvania laws; and the toll-gate survives in some parts of the Keystone State in an acute form. But here as elsewhere things are changing for the better, and this will be more and more the case as touring increases in popularity. This result will be materially advanced by the large amount of up-to-date material in Volume III of the Blue Book.



REPAIRING SHERIDAN DRIVEWAY NORTH OF CHICAGO.

SHERIDAN DRIVEWAY SEVERELY INJURED.

CHICAGO, June 17.—Chicago and lake shore automobilists have had a narrow escape from losing a long stretch of their favorite driveway, the famous Sheridan drive that is planned to eventually reach from Chicago to Milwaukee. Lake Michigan during the last three months has had such a continuous stirring by high winds as to break any past record for bad weather. The waters were driven over the sheathing that had been planted out in the lake, and attacked the embankments of the roadway. South of Evanston the road lays between the eastern fence of Calvary cemetery and the lake shore. It is but a narrow strip at best, and it was this piece of roadway that the fiercely driven spray fairly lapped away until there was little more than a passage way.



AUTOMOBILE MAP OF PENNSYLVANIA, WITH PRINCIPAL CONNECTIONS INTO THE ADJOINING STATES.

AMUSING CHAPTER OF SELDEN LITIGATION.

Last week was productive of a somewhat diverting side-show in what has popularly come to be known as the Selden litigation—that is, the action of the Electric Vehicle Company vs. the Ford Motor Company over the Selden patent. There was a try-out of the "old gas buggy," which is said to represent Mr. Selden's first efforts, as well as of the duplicate car built on the same lines as an exhibit in the case. These trials took place Saturday, June 15, and Monday, June 17, at the old Guttenberg race track and were supposedly very much sub rosa—so much so that they were commented on by at least one of the motor papers last week and a fully illustrated account appeared in one of New York's dailies on Sunday, June 23.

Then the press bureaus of the two organizations took to the typewriter and the duplicating machine. Quite contrary to precedent, the defense came out with a full statement several days in advance, characterizing the whole affair as a lame attempt to make capital out of the trial; further, that Mr. Selden had requested that no publicity be given the affair, and that the trial was not ordered by the court, as claimed; and that the "1877" label on the old car is the most ancient thing about it, barring the original cylinder casting, as the remainder has all been rebuilt, with considerable more of similar import, not omitting the fact that the first day's trials were a fiasco and the second were not much better. R. A. Parker, of counsel for the defense, is quoted at length on the matter, giving his reason for his statement as the bad faith of his opponents in rushing into print when there had been a mutual understanding that no publicity was to be given the affair.

Apart from the Sunday newspaper story nothing was heard from the publicity bureau of the Licensed Association until Wednesday morning, when a full set of photographs and the complainant's side of the case were sent out—entirely too late for publication in this week's issue of THE AUTOMOBILE. According to the matter accompanying the pictures, both the old car and its new duplicate made a most excellent showing of their powers of running and hill-climbing, the latter consisting of the grade to the paddock of the old track.

GRAND PRIX AND GERMAN RULES FOR BRESCIA.

PARIS, June 19.—Disappointed last year by the adverse action of the government, the Automobile Club of Milan now announces its 1907 Brescia meeting, in Northern Italy, with a great flourish. There are two distinct races, one for racing machines of any power compatible with a fuel allowance of 6.6 gallons per 62.6 miles. In all essential features it is a second edition of the French Grand Prix, and will doubtless be competed by most of the starters in the French event. The Velocity Cup, a \$5,000 trophy, will go to the victorious driver, and the engineer of the car will be awarded the cup of the Automobile Club of Milan.

The second race is for so-called touring cars with a maximum cylinder volume of eight liters. Gasoline of the specific gravity of 680 to 720 must be used, wheelbase must not be less than 118 inches and weight not lower than 2,585 pounds. There are a few other conditions regulating the nature of dashboard, height of seats and road clearance, etc., every feature of the German Emperor's race being embodied in the regulations.

IMPORTERS WOULD EMULATE PARIS SALON.

Official confirmation of December 28 to January 4 as the date of the Importers' Salon in Madison Square Garden has been made by the show committee. A uniform system of decoration, announced as something distinctly foreign and artistic, will be adopted, and the event will be known as "The Parisian Salon Transported." André Massenat has been appointed chairman of the show committee; E. R. Hollander is treasurer; C. R. Mabley secretary and manager, and E. Lillie will be responsible for Italian and English exhibits.

KULICK MAKES NEW RECORDS IN FORD SIX.

DETROIT, MICH., June 24.—In the twenty-four-hour race at the State Fair Grounds, which ended at 10 o'clock Saturday night, Frank Kulick, at the wheel of a 40-horsepower six-cylinder Ford, carried off all the honors. In addition to beating the world's record for that time by the very substantial margin of 309 miles, his total for the twenty-four hours footing up 1,135 miles, he also smashed many track records for intermediate distances. At the end of nine hours he had covered 429 miles at an average speed of 47.2 miles an hour, as against the best former track record of 33 miles an hour. In ten hours he went 480 miles, or an average of 48 miles an hour flat, while at the twelve-hour mark he raised this to 592 miles, or an average of 49.33 miles an hour. His record at fourteen hours was 684 miles and at fifteen hours 731 miles, his running being most consistent.

At the latter point Herbert H. Lytle, in the Pope-Toledo Vanderbilt Cup racer, was second with 724 miles to his credit, followed by Charles Coey, in a 60-horsepower Thomas, with 649 miles. At the finish Lytle had made 1,109 miles and Coey 997 miles. The only mishap of the day which might have been a serious one was caused by a tire bursting on Lytle's car, sending it through the fence a complete wreck. He escaped injury and got his reserve car into action within a few minutes. The other scores ranged from 798 miles down to 713. The car driven by Eddie Bald and "Kid McCoy" dropped out.

INDEPENDENCE DAY RACES AT LOWELL.

LOWELL, MASS., June 25.—Straightaway road races will be held on the Lowell-Kingsbury Boulevard on the afternoon of July 4. Events provided for are a five-mile contest for 35-horsepower cars and up; a five-mile race for 60-horsepower machines; a mile standing start and a mile flying start free for all. A silver cup is offered by the Heinze Electric Company, of Lowell, for each of the five-mile races. The course is six miles long.

BERKSHIRE ASSOCIATION PLANS FIRST MEET.

READING, PA., June 25.—Ten events for all types of gasoline and steam automobiles constitutes the program arranged by the Berkshire Automobile Racing Association on the Shillington track on July 4. Distances are two, three and five miles, and the machines provided for cover all classes from motorcycles costing \$225 to touring cars costing up to \$5,000.



MANAGER J. L. SNOW AND HIS PEERLESS ON BLUE HILL.

Blue Hill Observatory is located on the top of Blue Hill, near Boston, a few miles to the south of the city, and is the highest point of land on the Atlantic Coast from Maine to Florida. The property is controlled by the park commissioners, and autos are barred. A footpath leads to the top; also a winding road, which is very steep and rough.

BRIEF ITEMS OF NEWS AND TRADE MISCELLANY

It has remained for the Thomas Flyer testers at the Buffalo plant to attach a most appropriate cognomen to the motorcycle "cops," who blossom each spring and whose duty is to exert a restraining hand on those who are tempted to "let her out." Henceforth Buffalonians will know them as "corn-poppers."

In a way the winners in the recent Herkomer tour, which is generally credited with being the most strenuous event of its kind held on the Continent, won a victory for an American manufacturer, the first and second cars to finish in the tour as well as the third to come in after the hot contest for the Emperor's Cup using Vacuum Mobiloils for lubrication.

As a result of the greatly increased demand for Witherbee storage batteries, particularly from Canadian points and the Middle West of the United States, the makers have found it necessary to increase the facilities of their branch factory at Detroit, Mich., which supplies this territory. C. E. Brelsford has recently been placed in charge of this plant and is making things hum.

Miller Brothers, of Amesbury, Mass., who are pioneers in the automobile body building business, have recently found it necessary to double their facilities in order to take care of the demand. Their plant now occupies a five-story building measuring 65 by 220 feet and employing 125 men. They are now devoting their entire attention to automobile work and turn out bodies complete, either finished or in the white.

Three Dragon cars have been entered in the Chicago Motor Club's reliability run to be held on June 28 by the Branstetter Motor Company. The route of the run is via Libertyville, Half Day, Wauconda and McHenry to Waukegan, and is so arranged that the touring cars and high-powered runabouts will have to travel 170 miles and the small cars and runabouts about 146 miles. A large entry list has already been made up.

When last heard from the 24-horsepower Premier touring car that is making a non-stop road run under the auspices of the Bridgeport Automobile Club had covered 4,017 miles and was still going strongly. This means that the engine has been running continuously for 384 hours without a single adjustment having been made. The run started on June 3 and as many as ten passengers have been carried at one time to demonstrate the car's power.

Still another manufacturer has become convinced of the fact that shock absorbers are a necessary part of a car's regular equipment. This is the Dayton Motor Car Company, Dayton, O., who build the well-known Stoddard-Dayton cars and who have just placed an order for sixty sets of the Truffault-Hartford shock absorbers for some of their 1908 output. This makes eighteen manufacturers in all who now equip their cars in this manner.

It takes a western sporting man to really originate language of the truly descriptive kind as witness this from this "Tex." Rickard of Goldfield, Nev., on his reasons for buying a 40-horsepower Acme touring car. "I decided to pay my good cash for this machine," he says, "because it is not built with a tin engine and a papier mache transmission nor wooden springs, and a cheap

car would stand no show out here at all, so I plunged on quality."

As part of its sales campaign, G. E. Risley and D. C. Lull, of the Electric Vehicle Company's sales department, are making a tour of the State of Maine, Mr. Risley driving a 24-horsepower, and Mr. Lull a 45-horsepower Columbia. Both cars were driven to Boston and from there shipped to Bangor. Mr. Risley has a large following in Maine and Mr. Lull is well known for his performances behind the wheel, having participated in the New York-Chicago record-breaking run.

Kenneth A. Skinner, one of the veteran automobile dealers at the Hub, suffered a severe loss early last week through the destruction of his fine garage building in the Back Bay district of Boston by fire. The watchman who discovered the fire succeeded in saving a few small cars, but three imported limousines, a number of touring cars and runabouts, as well as a number of cars on storage, were destroyed, the loss being estimated at \$50,000. Mr. Skinner's portion of this aggregates about \$25,000, only partially covered by insurance.

That there is no sign of a falling off in the demand for the Franklin air-cooled cars is quite evident from the fact that their makers—the H. H. Franklin Manufacturing Company, Syracuse, N. Y.—have just found it necessary to add another reinforced concrete building to their already extensive plant. This measures 60 by 100 feet, is five stories high and will increase the capacity of the plant by 300 more cars a season. The contract calls for its completion at the end of ninety days and, when running, the company's pay roll will be swelled to 2,000.

For the first time in a long while an electric has come to the front in competition with gasoline cars. This was a Baker roadster driven by E. Gruentfeldt, chief engineer of the Baker Motor Vehicle Company, who showed what an electric can do in the way of hill climbing at the Cleveland Automobile Club's meet at Stucky Hill. The latter was a stiff test, but the Baker made it in 1:41 2-5, beating the time of eighteen gasoline cars and coming within a few seconds of the best performance of the stripped cars. The run was made from a standing start.

Denmark is coming to the fore as an automobile country, and it is significant that an American car—a two-cylinder Reo—should have been one of the few to finish with a perfect score in the most strenuous contest ever held there. This was a reliability run held over a 300 kilometer hilly course in the vicinity of Copenhagen by the automobile club of that city on May 26. That this is not an isolated instance is evidenced by the fact that a Reo won a silver cup in its class in the Bridgeport hill climb and was one of the first five to finish in the strenuous Albany run of the New York Motor Club.

Under the direction of F. A. Drake, New York manager of the Fisk Rubber Company, a Locomobile touring car has been equipped with the new Fisk removable rims and heavy car type tires and will be driven from Albany, N. Y., to Cleveland, O., by way of Troy, Schenectady, Binghamton, Elmira, Syracuse, Utica, Rochester and Buffalo. At the latter place it will be turned over to Mr. Zimmerman, Chicago repre-

sentative of the Fisk company, who will drive it to Cleveland, where the car is to enter the Glidden tour. Stops will be made at the cities mentioned to demonstrate the merits of the new tire.

Ten thousand miles in a 50-horsepower Apperson touring car with a broken spring as the only work necessary on the car is the record made by Calvin Smith, of Chicago, in a tour abroad from which he has just returned. But for this mishap, which was caused by the car dropping off a small wooden bridge while running through part of the Alps at night, Mr. Smith would have had a perfectly clean score to report. He included Spain in his itinerary—that land of poor roads and worse accommodations that is religiously avoided by the tourist. His car is to be used on an attempt at the New York-Chicago record this week.

Record-breaking shipments of gasoline cars have become a matter of more or less common occurrence, but it has remained for the Columbus Buggy Company, of Columbus, O., to set up a standard in this field where electricians are concerned. These makers recently made a ten-car shipment consisting of forty electric automobiles to their western New York State agent, A. V. Hart, at Rochester, N. Y., which is believed to overtop anything of its kind. The makers of electricians are usually as quiet about their doings as are their cars in running, but this is one that gives some idea of the extent of the demand for these easy-going town cars.

With the recent addition of a large steam hammer and other increases to the facilities of their already extensive plant, the Anderson Forge & Machine Company, of Detroit, Mich., are in a position to do a considerable amount of general forging beside their specialty of making engine crankshafts for which their machine shop equipment is particularly designed. This brings the plant's facilities up to twenty-one hammers of various sizes, so that it is equipped to manufacture an extensive range of drop forged parts for automobile work. A new building, measuring 40 by 150 feet, and two stories in height, has also been erected for a die room, the additions representing an outlay of \$150,000.

A few years ago Death Valley was considered impassable even to the automobile, but now it is included in record runs as witness the performance of a 35-horsepower Peerless touring car which was driven the entire distance from Rhyolite, Nev., to Los Angeles, Cal., a stretch of 400 miles in a little over two days. With Dick Allen at the wheel and Fred H. Vahrenkamp and a party in the tonneau, the start was made from the former place on Tuesday at 11 A. M. and Los Angeles was reached the following Thursday at 1:30 P. M. Allen is known as the youngest driver in Nevada, but brought the car through without a mishap, and though the sand was often up to the hubs in parts of Death Valley on Wednesday the car made 200 miles.

NEW AGENCIES ESTABLISHED.

Pirelli & Company, large manufacturers of cable and rubber goods, at Milan, Italy, will open an American branch for their tire department at 296 Broadway, New York.

A new branch house has been established at Broad street and Fairmont avenue, Phil-

adelphia, by the Goodyear Tire and Rubber Company. A thoroughly fitted up repair plant, including a steam vulcanizer, is among its appointments. L. S. Hall will manage the branch.

The Bellefield Motor Company, of Pittsburgh, Pa., has taken the agency in that territory for the De Luxe cars. The company has a seven-story garage building adjacent to the Schenley Hotel and Duquesne Gardens. A new company has been formed in Chicago to handle the De Luxe, to be known as the De Luxe Motor Sales Company, with a capital stock of \$50,000. The De Luxe has been handled this season in Chicago by the McDuffee Automobile Company.

Two more of Pennsylvania's prominent automobile factories—the Dragon and the Pennsylvania—established local branches in Philadelphia last week. The Pennsylvania secured representation within the charmed circle when the West-Stillman Motor Car Company opened quarters last Saturday at 153 North Broad street. Besides the Pennsylvania, the new firm will handle the Mercedes, Mr. Stillman having been the former local representative of the Mercedes Import Company. E. P. West, the other member of the firm, is a newcomer in the trade. The Dragon salesrooms have been established at 143 South Broad street, across the street from the Bellevue-Stratford. A. B. Cumner has been appointed manager.

PERSONAL TRADE MENTION.

Otto C. Owen, brother of R. M. Owen, has been appointed manager of the Chicago branch of R. M. Owen & Company, to succeed L. J. Ollier, who has gone to California to engage in business at Los Angeles. Mr. Owen has been identified with the Reo and Premier Chicago branch for some time as assistant manager.

J. B. Kavanaugh, for some time manager of the Cleveland branch of the Hartford Rubber Works Company, has resigned. He was for a number of years on the road for the Hartford people and did very effective work. P. H. Goodall, for several years representative for Hartford tires on the road in Ohio territory, has been appointed branch manager at Cleveland to succeed Mr. Kavanaugh.

Several additions have recently been made to the H. H. Franklin Mfg. Co.'s force, notably George Ostendorph, formerly branch manager for the Hartford Rubber Works Company at Buffalo; H. B. Henly, of the New York Motor Company, and George E. Messer, of the H-O Company at Buffalo. These men are now at the Franklin factory at Syracuse taking a thorough course of instruction in their new duties.

Walter Keenan, formerly manager of the Standard Oil Company's interests at Dayton, O., has taken the general management of Speedwell Motor Car Company, of that city. This concern is one of Dayton's new enterprises, and the organization is a very strong one, headed by P. A. Schenck, president of the Dayton Malleable Iron Company, and M. Sternberger, of Jackson, O., president of the Superior Coal Company.

NEW TRADE PUBLICATIONS.

The Pratt & Whitney Company, of Hartford, Conn., has sent out a complete catalogue of over 200 pages descriptive of tools in general use. At the end of the book is a series of tables of English measurements and their metric values.

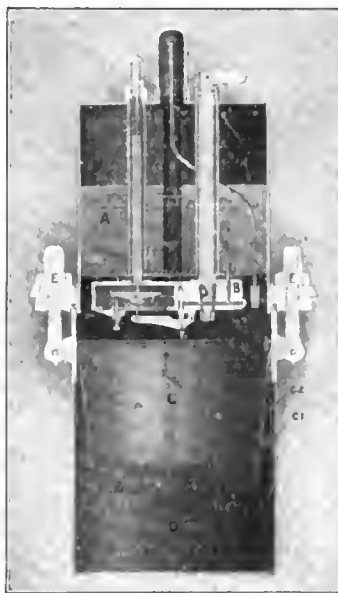
Enclosed within a dainty cover, the 16-page catalogue of the Traveler automobile, manufactured by the Bellefontaine

Automobile Company, Bellefontaine, Ohio, deals with the two models manufactured by this company. They are Model A, an air-cooled machine, and Model B, a water-cooled. Details of construction and illustrations of parts are given in the booklet.

It is a useful little book of about eighty pages that has been sent forth by the Diamond Rubber Company, Akron, Ohio, containing useful information to all tire dealers. Descriptions of various types of pneumatics, solids, and single tube tires of all dimensions are given, together with complete price list. The Marsh rim is given considerable attention, and instructions are presented for dismantling and mounting it.

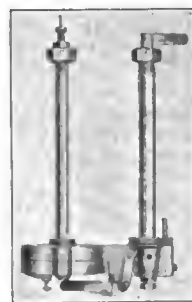
INFORMATION FOR AUTO USERS.

New Automatic Gas Generator.—Some important and much-needed improvements in acetylene gas generators are claimed by the makers of the Peterson New Automatic Generator, the O. W.



SECTIONAL VIEW PETERSON GENERATOR.

Petersen Manufacturing Company, 1253 Michigan avenue, Chicago, Ill. Chief among these is a positively automatic water control which automatically adjusts the rate of gas production to suit the number of lights burning so that no hand adjustments whatever are necessary. The Peterson device consists of a



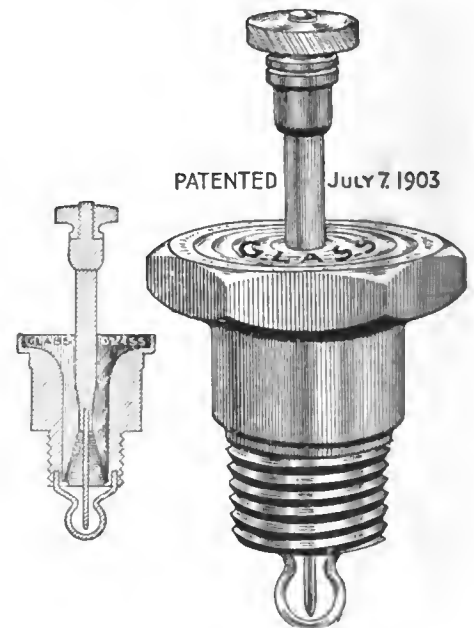
WATER CONTROL.

The automatic tossing carbide basket insures a constant rotation of the fresh carbide to the top next to water, while

the spent carbide is passed down next to the grate, where the ash is eliminated. The basket is hung on its upper edge at one side by a helical spring, from which it obtains its movement. The performance of this generator in practice substantiates the claims of its makers, so that the device is proving popular with the trade.

Weiss Siren Horn.—L. T. Weiss is the inventor of a new and improved type of siren horn which is now being marketed by the Motor Accessories Company, 14 Dutch street, New York. The improvement consists chiefly of the use of a revolving sound-producing member of but a fraction of the weight ordinarily employed for this purpose, thus entirely eliminating not alone the objectionable vibration usually set up, but also obviating all risk of breaking off at the shaft. Its extremely light weight gives it a minimum of inertia, so that the horn sounds the moment the friction pulley comes in contact with the flywheel. A universal joint is fitted to the pulley-holding connection, making it a simple matter to attach, while a neat appliance carries the flexible tube centrally, eliminating all objectionable wiring.

A Glass Window Spark Plug.—To be able to look through a window into the cylinder and observe the conditions under which the engine is working is an advantage obvious to all automobilists. A spark plug which allows of this has been produced under the name of the Anderson and is being handled by W. E. Hutton of 350 Fulton street, Brooklyn. Instead of porcelain, the insulation is of glass welded to the steel case and of the same expansi-



SECTIONAL AND PROSPECTIVE GLASS PLUG.

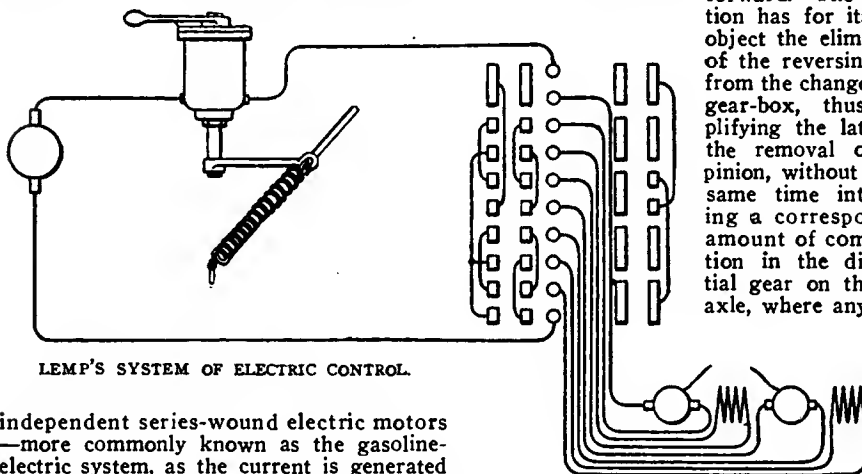
bility as the steel. The method of filling the case with molted glass is the subject of a patent, the process employed being of such a nature that the glass and steel expand together, removing all risk of cracking. A couple of plugs observed under working conditions recently showed with what facility a missing cylinder was detected, and how readily carbureter and ignition adjustments could be made. Another feature of the plug is that there are three sparking points instead of one.

SOME GRIST FROM UNCLE SAM'S PATENT MILL.

Control for Gasoline-Electric System.

This invention comprises a control for automobiles of the type in which the driving wheels are independently rotated by

the large bevels shown, the result being that while in mesh with the left-hand one, as shown, the vehicle will run backward, and when engaged with the other will run forward.



LEMP'S SYSTEM OF ELECTRIC CONTROL.

The invention has for its chief object the elimination of the reversing gear from the change speed gear-box, thus simplifying the latter by the removal of this pinion, without at the same time introducing a corresponding amount of complication in the differential gear on the rear axle, where any addi-

independent series-wound electric motors—more commonly known as the gasoline-electric system, as the current is generated by a dynamo rotated by a gasoline motor of the usual type. The object is to provide novel connections for electrically braking the vehicle to prevent skidding by manipulating the electrical relation of the motors to one another, as well as the relation of their parts. It consists of the combination of a vehicle having independently rotatable driving wheels on its opposite sides with series-wound electric motors mechanically connected thereto. A resistance and controlling switch is adapted to short-circuit the motors through the resistance with their fields in series and their armatures in parallel. The tendency to skid is thus automatically compensated for, as the motors, and consequently the driving wheels, are kept running at the same speed.

tional weight or mechanism would be even less desirable than in the gear-set. Simple provision for effecting the change is made by equipping the forward end of the propeller shaft with the usual universal joint and an operating lever, as shown mounted on the case enclosing the moving shaft.

The inventor and patentee is William A. Slater, Cedar Point, Kan.

Improved Steering Gear Connection.

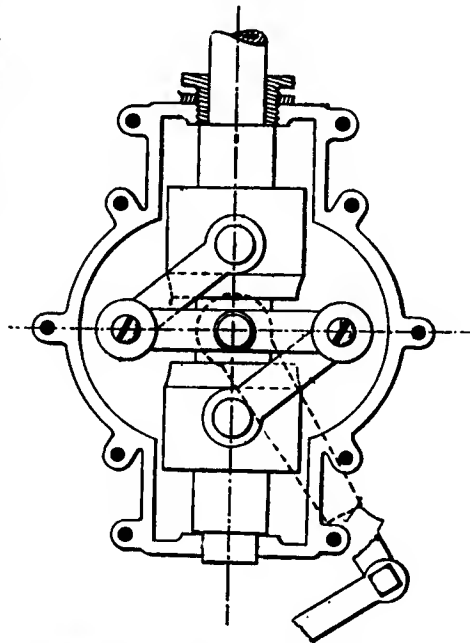
In the present instance, the object of the invention is to simplify the mechanism which operates the crank arm which controls the movement of the connecting rods to the steering wheels. The arrangement of the parts is such that the steering wheels may be turned from one extreme to the other with a minimum of movement of the steering post, and positively locked in their adjusted position without unduly straining the parts of the steering mechanism, or causing excessive vibration of the steering post while the steering wheels are passing over obstructions. In outline, the invention consists of the use of two moving members concentric with and adapted to be moved upon the steering pillar by the revolution of the latter, and two arms, fastened at one end to opposite points on the

interior of the housing and at their other ends, to the two moving members just mentioned, as shown.

The inventor is Arthur E. Rockwell, of Oswego, N. Y.

A New Electric Transmission.

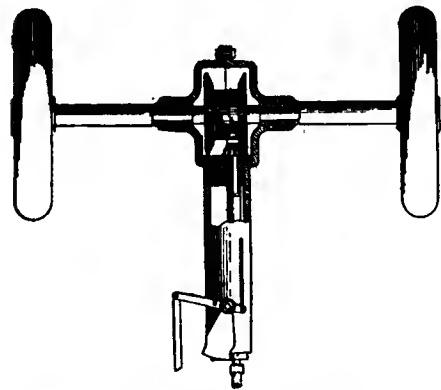
This invention consists of the combination of an automobile running gear or chassis, complete, whereon is mounted a prime mover such as the gasoline motor of



REDUCING MOVEMENT STEERING GEAR.

the type usually employed for this purpose, driving an electric generator, supplying current to electric motors attached directly to the rear wheels, there being no mechanical connection between the prime mover and the road wheels. The invention consists mainly in so arranging the controlling lever for the engine of the vehicle, that while in normal operation it will remain in the position in which it is placed, while if the electrical circuit is broken, it will return automatically to the lowest speed position, means being provided in the electric circuit for holding it in such position.

The inventor is Herman Lemp, of Lynn, Mass., the patent being assigned to the General Electric Company, of Schenectady, N. Y.

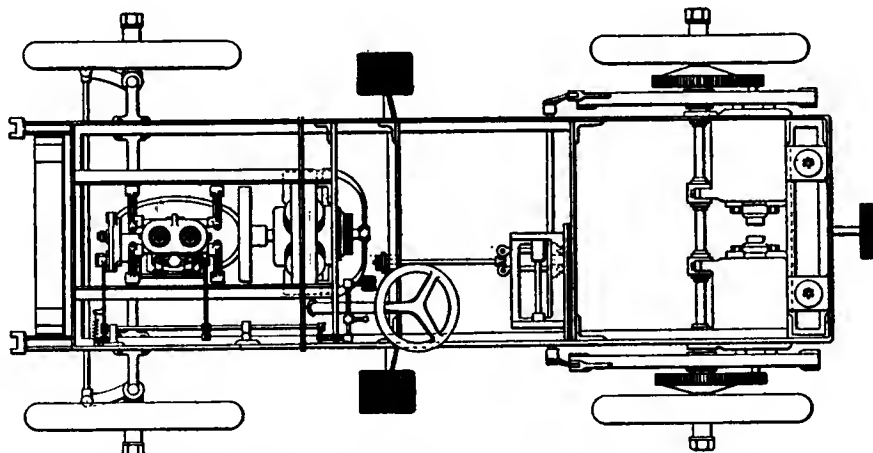


COMBINATION OF REVERSE AND DIFFERENTIAL.

The inventor is Herman Lemp, Lynn, Mass., the patent being assigned to the General Electric Company, Schenectady, New York.

Combined Reverse and Differential Gear.

A novel form of combination reverse and differential gear is covered by this invention, which permits of only using such pinions as are necessary to provide the required forward speeds in the change speed gear box. The differential is of the usual spur type and instead of having one large bevel pinion, is provided with two of the same size, facing each other. The propeller shafting carrying the small driving bevel is adapted to be shifted laterally so as to permit of its engagement with either of



GENERAL ELECTRIC CO.'S SYSTEM OF GASOLINE-ELECTRIC TRANSMISSION.

Specially reported for THE AUTOMOBILE by Beeler & Robb, Patent Lawyers, Washington, D. C.

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AUTOMOBILE in running order; has new cylinder, 6 1/2-inch bore; two-piston engine, sliding gear transmission, two ahead and reverse; 32x4-inch rear and 32x3-inch front tires; haven't been punctured; old cylinder tested 21-h.p.; first offer \$350 takes it. M. P., care The Automobile.

AUTOMOBILES—\$75 to \$2,750; a number of slightly used motor cars which have been taken in trade are offered for sale at extremely low prices; all have been gone over and placed in first-class condition. Seven-passenger Thomas and Pierce touring cars, 40 and 50-h.p., \$1,750 to \$2,750; 5-passenger Thomas, Pierce, Packard, Winton, Rambler and Pope-Hartford touring cars, 24, 28 and 40-h.p., \$650 to \$1,600; 2, 3 and 4-passenger Thomas, Pierce, Olds, Packard, Pope-Hartford and Winton runabouts, \$75 to \$350; write for particulars. C. T. Faxson, 1200 Niagara St., Buffalo, N. Y.

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BUICK—1907, 4-cylinder, new touring car; used only as model, at small discount. W. Ricker, P. O. Box 146, Portland, Me.

CADILLAC—1905 runabout, with top; just fitted with three new tires; rear tires with Midgley tread; one extra casing; two extra inner tubes, two gas and two oil lamps. Prest-O-Lite gas tank; has never balked on the road, and has just been overhauled by competent men; run one year and half. Address Box U, Steubenville, Ohio.

CHADWICK 1907 cars are all sold. We want to clean up for 1908 business, and offer the following at prices which should sell them at once: 1906 Chadwick, 50-h.p. brand new; 1906 Chadwick, 50-h.p., refinished like new; both cars guaranteed one year; one Panhard 80-passenger wagonette; one 24-h.p. Locomobile. Chadwick Engineering Works, Spring Garden and 32d Sts., Philadelphia, Pa.

GET WISE—We have anything you want in second-hand cars—Packard, Winton, Locomobiles, White steamers, Franklins, Buicks, Oldsmobiles—and bargains at that. Get our list for March. The Sid Black Automobile Co., 630 Walnut St., Cincinnati, Ohio.

GREATEST BARGAINS in used automobiles ever offered in this country; 100 different styles. Tell us about what you want and we will send you descriptive matter. C. A. Coey & Co., 1424 Michigan Ave., Chicago, Ill.

HAYNES—40-h.p., Model K, 1906; I have two; \$1,850. Chas. E. Pelton, Lowville, New York.

MARMON MODEL D—1906; air-cooled; 30-h.p.; Rushmore lights, Sprague top, speedometer, 8 extra tires; machine just overhauled under owner's supervision; in excellent condition; price asked, \$2,000; cost \$3,300. E. H. Bancker, 92 Third St., Brooklyn, N. Y.

OLDSMOBILE—In fine shape; top and all accessories; \$225. Geo. S. Dales, Akron, Ohio.

PACKARDS, Reos, Cadillacs, Fords, Toledos, Maxwells, Locomobiles, Olds, Knox, Wayne, Franklin, Autocar, Pope-Hartfords, Yale, Peerless, Thomas, Buicks, Winton, Pierce, National and many others; every one a bargain and you get a square deal. The Starlin Company, 1094-1100 Main St., at St. Paul St., Buffalo, N. Y.

PEERLESS—Two 4-cylinder; one 4-cylinder Ford; all in first-class condition, having been thoroughly overhauled. A. Dussault Auto Works, Lockport, N. Y.

POPE-TOLEDO touring car; 1906; complete with top; in first-class condition; price, \$2,750. Address John H. Capstick, Boonton, N. J.

POPE-TOLEDO—35-h.p. touring car; good condition; side entrance; used two seasons; cost, new, \$4,000; price reasonable. N. N. Hill, East Hampton, Conn.

POPE-TOLEDO—1905, 35-h.p., for sale; has folding top, with storm curtains, French glass wind shield, Hartford suspensions, Gabriel horn and 8-day clock; tires in excellent shape; demonstration on request. Mr. Covell, Central Park West and 110th St., New York.

RAMBLER—16-h.p. touring car, good as new; '04 model, full equipped; \$450. F. W. Jackson, Holland, Mich.

RAMBLER TOURING CAR—Five-passenger, side entrance; complete equipment; \$600. L. J. Hansen, 32 East Main St., Massillon, Ohio.

RAMBLER TOURING CAR—Five-passenger; splendid condition; canopy top, glass front, and side baskets; \$500 cash. Speed Changing Pulley Co., Indianapolis, Ind.

ROYAL TOURIST—1906; gas and side lamps, speedometer, recently repainted; in first-class order. 724 E. & B. Bldg.; Rochester, N. Y.

SPECIAL OFFERS in desirable automobiles—Among the 250 cars now here the following have been consigned for quick sale: Corbin, 4-cylinder, splendid condition, top, lamps, etc., \$900; Peerless, like new, fully equipped, \$1,200; Aerocar, Prest-O-Lite gas tank, Gabriel horn, etc., \$1,350; Columbia, 4-cylinder, like new, fully equipped, \$1,500; Franklin, 6-cylinder, little used, \$1,700; Pope-Toledo, 4-cylinder, 30 to 35-h.p., leather top, lamps, etc., \$1,800; Panhard, 4-cylinder, \$850; Thomas, 50-h.p., top, \$1,250; Packard, like new, 4-cylinder, \$1,000; Winton, in elegant condition, \$550; Buick, top, etc., \$650; Locomobile, 4-cylinder, cape top, \$1,250; Pierce-Arrow runabout, \$300; Knox runabout, \$300; Decauville runabout, 4-cylinder, \$950. Over 250 others; runabouts \$125 up; tonneaus \$250 up; a number of electric and steamers at special sacrifice prices. Manhattan Storage Co., Largest Auto Dealers in the World, 334-340 West 44th St., two blocks from 42d St. station 9th Ave. "L"; three blocks from Broadway, New York.

STANLEY TOURING CAR—Model F, with top, gas lamps, Ecco generator, extra shoe and two tubes, trunk and rack; car just been overhauled and repainted; owner going west, and car must be sold at once. Rutland Machine & Automobile Co., Rutland, Vt.

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STEVENS-DURYEA—1906, Model R car, with or without top; car newly varnished; not run over 2,500 miles, and good as new; tires good condition; Never-Out gas lights, generator; owner wants 6-cylinder; first draft for \$1,750 gets car; a bargain. Staacke Bros., San Antonio, Tex.

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ASTER MOTOR—24-30; suitable for automobile or launch; complete with transmission gear and clutch, La Coste coil, Lukenheimer oiler, Langmere carbureter, low-tension magneto, spark plugs, etc.; brand new, never run; cost, duty paid, \$2,300; will sell for \$1,300. Glasgow, 565 Washington St., Buffalo, N. Y.

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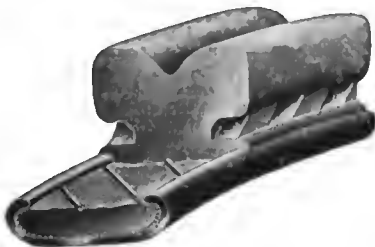
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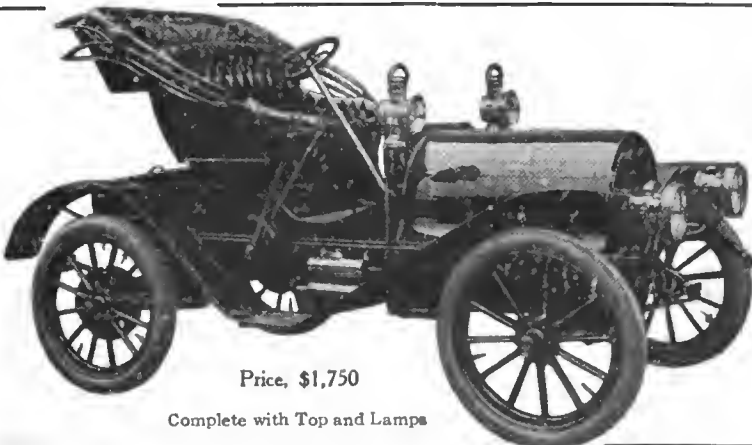
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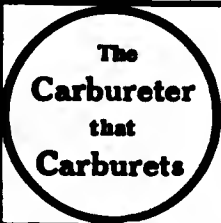


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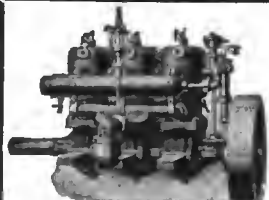
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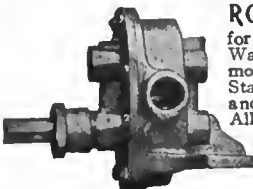
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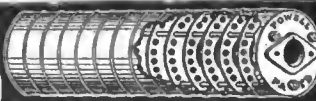
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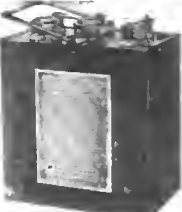
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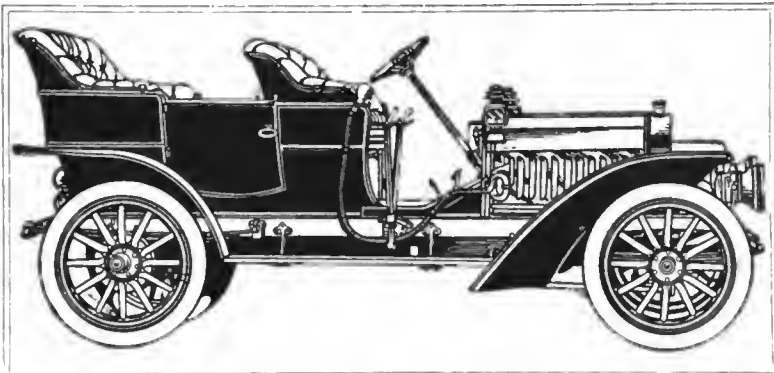
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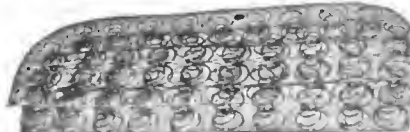
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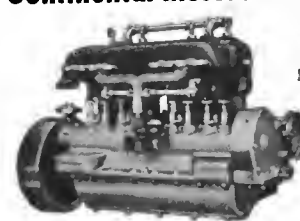
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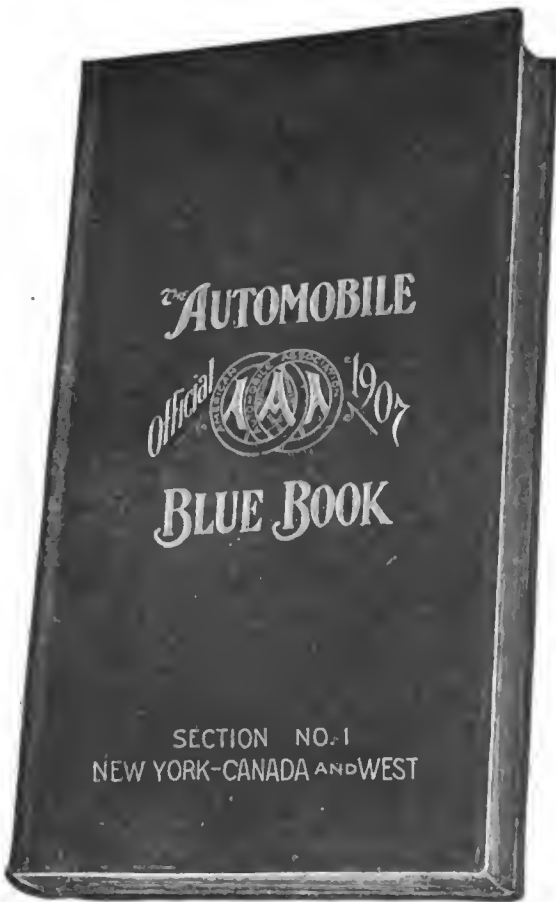
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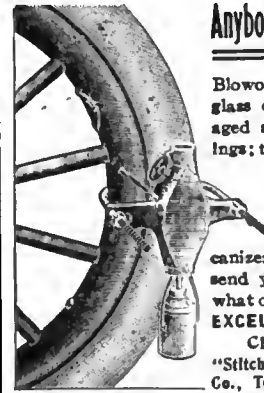
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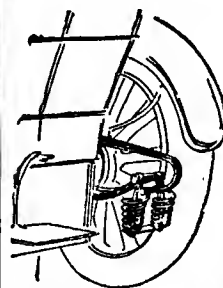


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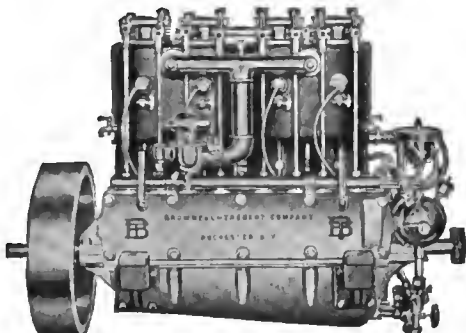
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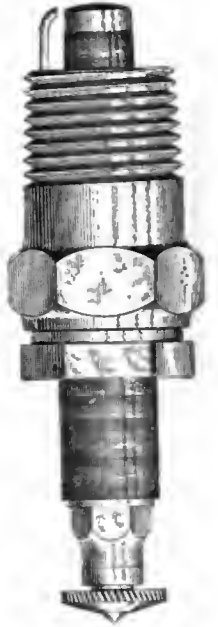
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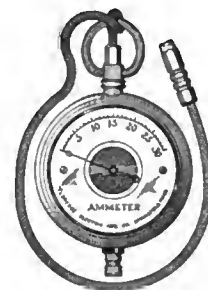
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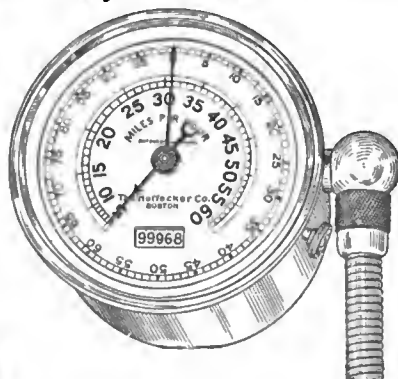
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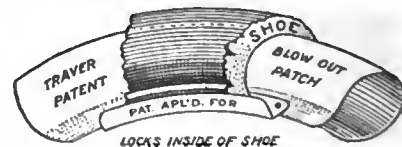
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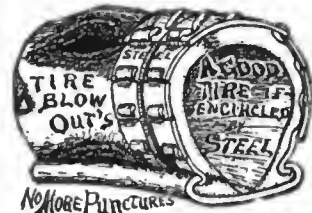
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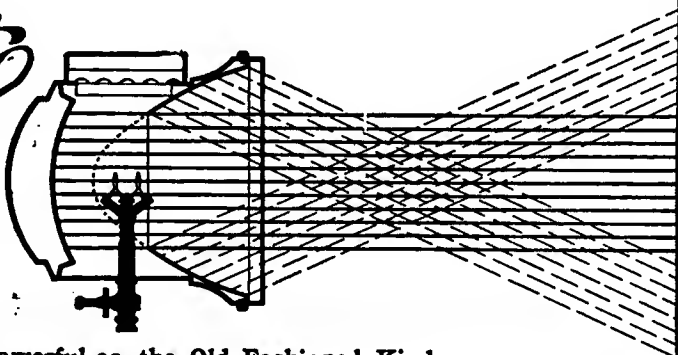
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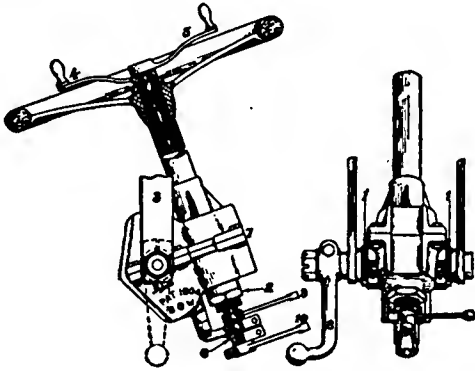
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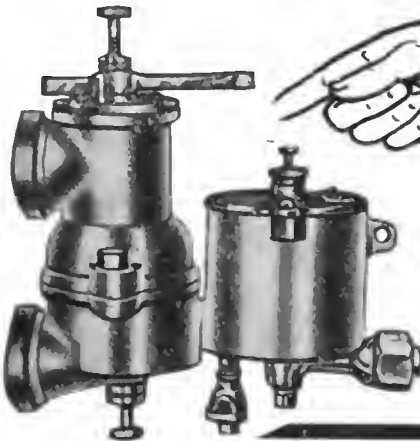


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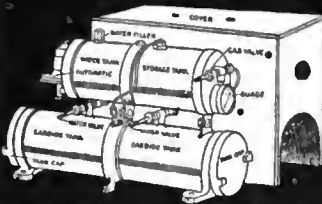
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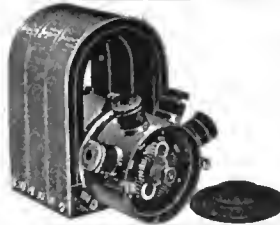
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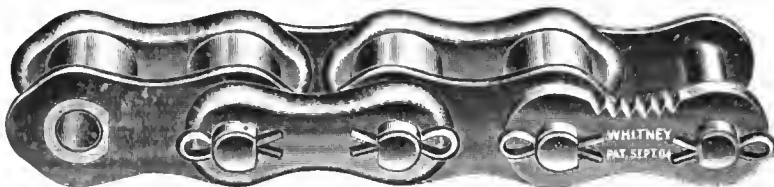
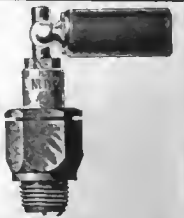
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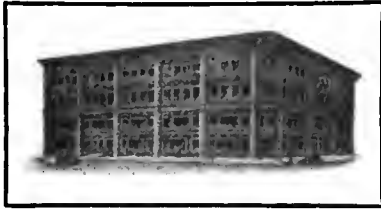
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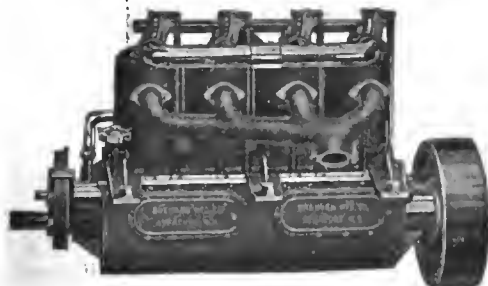
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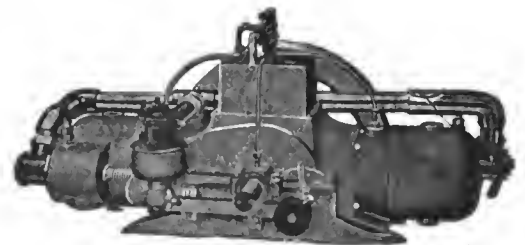
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Surrounded by 7,000 acres of picturesque scenery. All tickets sold by the Chesapeake & Ohio Railway have stop-over privileges at this famous resort. Elevation, 2,000 feet. Average temperature during the heated summer, 65°. Capacity, 1,000. Broad piazzas. Orchestra of 20 instruments. Elevators, telephones, cafes. Two New Clay Tennis Courts. The Lawns are unsurpassed as a Playground for Children. An Attractive and Inexpensive Place to Spend the Summer. Nature has contributed the most charming surroundings of scenery to the White Sulphur. Forest, vale and mountain are here in rare and unique combination, presenting at every turn new views of the picturesque, the beautiful and the grand, sufficient for the gratification of every taste. The Grand Old Fountain, shaded by ancient oaks, daily pours from its exhaustless resources more than 40,000 gallons of healing waters. Regular season June 15.

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Greenbrier, White Sulphur Springs, W. Va.



HOTEL WENTWORTH

FRANK C. HALL, Mgr.

New Castle, N. H.

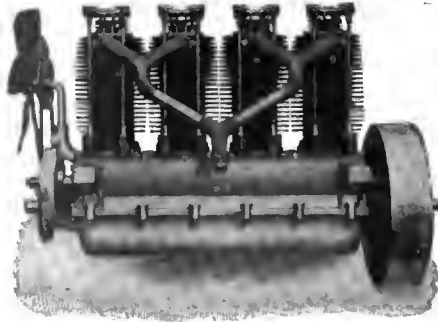
For eighteen years America's leading and most luxurious summer hotel. 475 sunny, outside rooms, private baths, all modern conveniences. Garage and restaurant for autoists.

Several hundred acres of virgin forest, seashore front and landscape gardens. Excellent clubhouse, golf links, tennis court, canoeing, fishing, sailing, and the largest salt water bathing pool in the world. Selected by the Government for the RUSSO-JAPANESE PEACE CONFERENCE, and embodying every comfort, convenience and attraction that money and thought can supply.

For Autoists A new garage and excellent a la carte restaurant, open at all hours, have been inaugurated this season at the Hotel Rockingham, Portsmouth, N. H., which is under same management.

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"THE REEVES" AUTO ENGINES AIR AND WATER COOLED



All kinds of weather look alike to "The Reeves" Engine. It's never too hot nor too cold, no road too long or too rough.

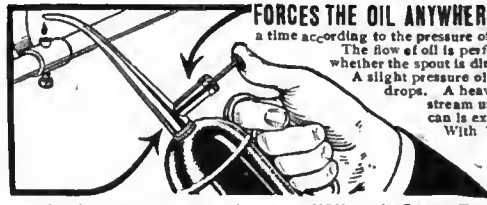
A few Model "E" for prompt delivery

We are open for 1908 contracts, and will build either from your designs or our own.

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FORCES THE OIL ANYWHERE. It delivers thick or thin oil, a drop or a tablespoonful at a time according to the pressure of the thumb on the piston. The flow of oil is perfectly controllable at all times, whether the spout is directed upwards or downwards. A slight pressure of the thumb delivers the oil in drops. A heavier pressure throws an even stream until the entire contents of the can is exhausted.

With The "CANNON" Force Feed Oiler there is no waste, the oil goes just where it is needed and nowhere else. No need to wipe up with a piece of waste afterwards.

For hardness, convenience and economy YOU need a Cannon Force Feed Oiler. Ask the supply man for a "Cannon" today. He has a supply or ought to. If he hasn't write me direct.

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FOUR LOTS FOR SALE**

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WILL IMPROVE FOR RESPONSIBLE TENANT

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Highest Grade Material and Workmanship. The Result of 20 years Experience in Jack Building

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Made only by the Buckeye Jack Mfg. Co. LOUISVILLE, OHIO



The only Jacks on the market having High Carbon Crucible Steel Drop-forged Racks and Pawls, insuring against breaking down under load.

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For a hot, fat, snappy spark
USE THE

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FOR SALE EVERYWHERE

New Catalog J-22. Something Electrical for everybody. Free on request.

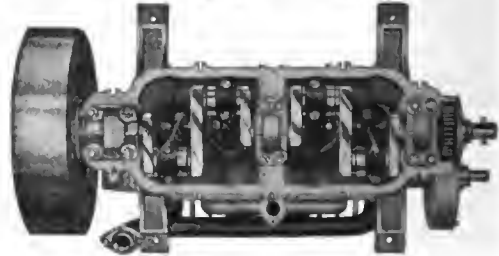
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Vertical 4-Cylinder—4½ x 4½.
Horizontal Opposed—4½ x 4 and 5½ x 4½.



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Successors to TURNER & FISH CO.

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Send Drawings and Specifications for Prices

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INNER TUBES

THE STRONGEST TUBE MADE
IMPORTED OR DOMESTIC

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AUTO LAMPS



As a light producer it is never failing and its exact focus utilizes every bit of the light. It is scientifically made by expert lamp makers and carefully designed by a master of the acetylene gas lamp industry. It has fewer pieces than any other make and each piece is of heavy drawn brass riveted or screwed (not soldered) together. Hence its great strength.

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A Non-Sulphating Storage Battery Igniter

PERFECT IGNITION AT GREATLY REDUCED COST

A recharge costing 50 cents at any Electrical Supply Station, will run your car as far as dry batteries costing at least \$12.00. This battery retains full power until the last, and will give the engine

MORE POWER AND SPEED

These Batteries are guaranteed. They are not affected by water and are especially adapted to Marine use. The plates will not buckle nor will "active material" be dislodged. Our prices are right. Send for illustrated matter giving styles and prices.

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NOISELESS GEARS


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We can furnish you with Noiseless Gears of a special gray vulcanized fibre which is very durable and is not affected by oil or moisture.

WRITE US.

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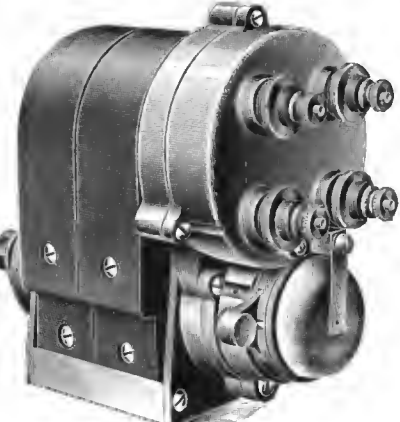
THE IDEAL IGNITION EQUIPMENT



if a coil is used, consists of a Dow Coil, Dow Double Insulated Mica Spark Plugs and a Dow Ball Bearing Timer.

If a magneto is preferred, the Dow "KOMET," in which the distributor and timer are incorporated, will give you more efficient service and less trouble than any other. The "KOMET" is an IGNITION INNOVATION.

Write for particulars.



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EASTERN GAS ENGINE DRY CELLS

Give more voltage, more amperage, more life, more uniformity and better efficiency than any other battery, and its recuperative power is the wonder and admiration of every user.

† EASTERN BATTERY CONNECTOR POSITIVELY WON'T SHAKE LOOSE

Eastern Carbon Werks
Carbon Place Jersey City, N. J.



Public Opinion

Acknowledges the Superiority of the Index

Individual work and care of construction makes this an instrument that will outwear an auto. Write for Booklet.

Oliver Instrument Co.
MINNEAPOLIS, MINN.

INDEX

Lavigne Oilers Assure Perfect Lubrication for Automobile and Motor Boat

"The proof of the pudding is in the eating thereof."

The following letter needs no further comment
Detroit, Mich., Sept. 26, 1906.

Lavigne Mfg. Co.,
Detroit, Mich.

Gentlemen:
Enclosed find my check in payment for the force feed oiler which I have just installed in my launch and find very satisfactory.

I want also to add that the one I have had on my automobile the past year has been most satisfactory, too, and amply repaid me for its substitution in place of the exhaust pressure feed oiler that I had on the machine. Very truly,
WALTER S. RUSSEL,
(Russel Wheel & Foundry Co.)

Specify the Lavigne Oiler on your car or boat and you will make no mistake



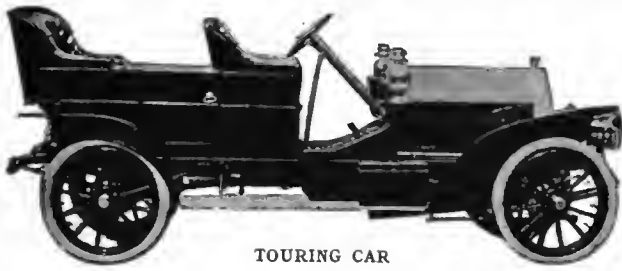
The Lavigne Oiler with Micrometer Adjustment
LAVIGNE MFG. CO., 602 Commonwealth Ave., Detroit, Mich. Descriptive matter sent on request

\$1.40 PREPAID TO ANY ADDRESS IN THE U. S.



GIVE A CARE to your gasoline pipe strainer, as nine times out of ten it is the secret of carburetor troubles. A little water or foreign substance in the gasoline will put your carburetor out of commission. Our strainer is a guarantee against such troubles. It is made from sheet brass, highly polished, and furnished with either 1/4 or 5/16 inch connections. The gasoline enters through the low connection, strains through a chamois placed at an angle across the globe, and passes to the carburetor through the upper connection cleansing the gasoline thoroughly. The foreign substance remains beneath the chamois and may be drained through the petcock. Write to-day for catalog. Special prices to manufacturers and dealers in quantities.

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TOURING CAR

RELIABILITY and
MODERATE
PRICE



In buying a "C & F" Car you get the advantage of **QUALITY** that stands all tests; the advantage of **PRICE** that defies all competition. : : :

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Either Model —
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The C.F. CAR

30 H.P. 4 Cylinders
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Mechanical Force Feed
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It is worth your while to investigate these cars. The high-grade quality and stylish appearance make them the most phenomenal value of the year.

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Excellent
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ALLYNE

Aluminum Bronze
Brass and Parsons-Manganese
CASTINGS

Made in THE ALLYNE WAY—means much to the Automobile Manufacturer who wants Castings when he wants them.

We will not quote on work we cannot deliver on the date promised.

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Pneumatic tires made puncture proof by incorporating Gumelastie Rubber Compound Core in old or new tires. Will last as long as the casings will remain intact.

It is solid, not a field. It is as resilient as air. It is as tough and as elastic as pure rubber. It does not jar the machinery.

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Luminous Face

Can be seen at night. Runs 8 days. Small, Accurate and Reliable. Winds, sets and regulates on outside of case.

Price, \$8.00

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That's Another Name for

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We positively GUARANTEE to make deliveries as promised

PRECISION APPLIANCE COMPANY
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BRAKE PERFECTION SECURED



No more worries necessary. No more accidents possible through failure of brakes to hold. Absolute safety to both passengers and car assured. Arrests skidding.

PROMPT DELIVERIES

The Moon Roller Bearing, Apex Friction Brake is so made as to be practically dust proof. The brake runs in grease, and its action is roller bearing. The friction

is caused by quadruple eccentrics, which force the pressure in four directly opposite motions, forming a complete revolution of friction, instantly.

They are Neat, Strong, Compact and Positive, acting directly on the rear wheels. They will outlive any car ever built.

Write for prices and further particulars.

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"EISEMANN-LAVALETTE" MAGNETOS

HIGH TENSION
LOW TENSION

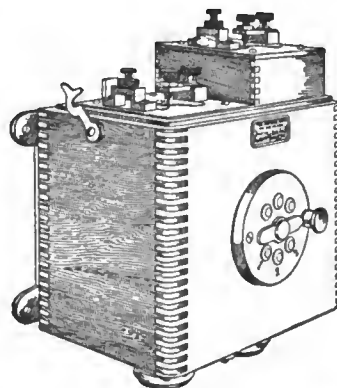
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Manufacturers



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The Why of the Duplex Coil

Two cores instead of one means short primary and secondary windings—no loss of energy in the coils—the full voltage being delivered to the

vibrator. They mean 4-times-greater magnetic force—the use of a strong spring and light armature, a quick, hot spark at that point of compression which produces *full force and power*.

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We will send the Duplex Coil, express prepaid, to any manufacturer or respectable automobile owner on its merits. Put this coil on any car in place of any other coil on the market, and if, after a reasonable trial, the Duplex Coil does not show greater efficiency, does not give a hotter spark, does not increase the power of your car, does not use less current for a given mileage and is not more generally satisfactory than any coil on the market, remove it from the car and return it to us at our expense, and the test will have cost you nothing.

If the coil bears out our claims, after a most rigorous trial, then pay us the small sum which we ask.

Write us to-day as your business stationery and a Duplex Coil will be sent you at once.

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Station N Fond du Lac, Wisconsin

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High Grade Steels for Motor Cars
in Bar Stock Drop Forgings and Pressed Steel Frames

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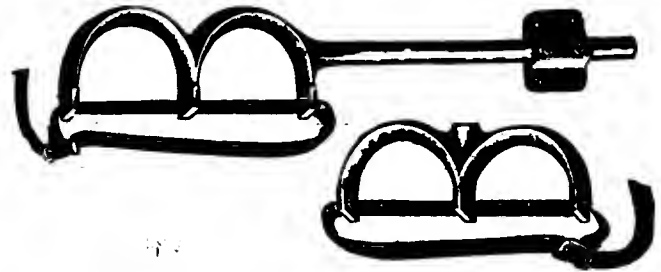
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ADJUSTABLE TIRE HOLDER

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Made of best quality brass, finely finished, and will hold either one or two tires.

Set consists of two long and one short piece.
List price, \$7.00

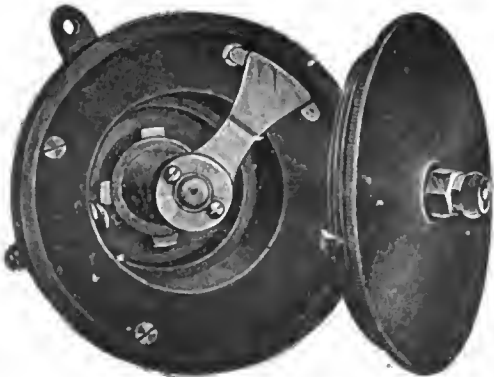


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The Leavitt Secondary Distributor and Spark Timer has been on the market for the past three years and has more than proved our claims of "Simplicity, Reliability and Efficiency." It has been tested out in the experimental departments of the leading manufacturers and the proof of its having won out is in its being adopted by a number of the leading manufacturers on their '08 cars in connection with the Magneto System. Hadn't you better investigate?

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1907 Oldsmobile fitted with the Skinner Rotary Triplex Tyre Inflator.

THEN INVESTIGATE OUR ENGINE-DRIVEN

Rotary Tyre Inflator

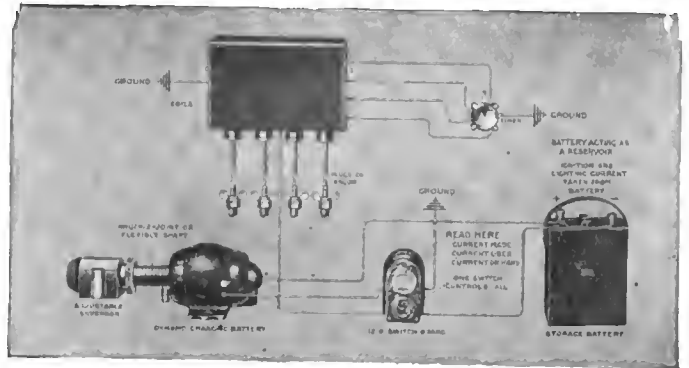
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Sole Manufacturers and Distributors

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"COMPLETE IN ITSELF"



Decide today to have an ignition system on your car that never runs out of current--in which the current is always a uniform voltage --and which will last as long as your car. In short decide on an

Apple Ignition System

"Floating the Battery on the Line"

It provides a charging outfit right aboard your car, complete in itself. The dynamo, run by the fly wheel of your engine, charges the battery, and keeps it always full of current of even voltage, of a quality ideal for ignition and lighting work. No limit to the distance you can travel with it. Send in your request at once for our Bulletin B-1.

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TRY US**

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Prompt Service and Best Quality of Work Guaranteed

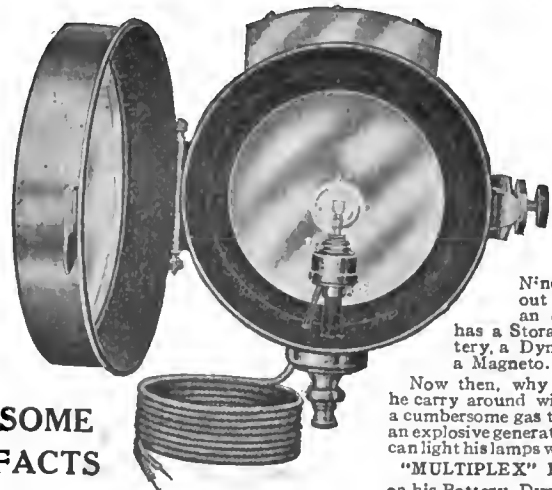
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NEW YORK

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(Patents Pending.)



**SOME
FACTS**

Nine times out of ten an owner has a Storage battery, a Dynamo or a Magneto.

Now then, why should he carry around with him a cumbersome gas tank, or an explosive generator if he can light his lamps with our "MULTIPLEX" LAMP, on his Battery, Dynamo or Magneto?

The "Multiplex" Lamp gives 30 to 32 candle-powers with reflector on 6 volts. It will burn from 300 to 400 hours and will give a blinding, dazzling light.

No storm can blow it out. No matches needed. No leaky hoses to cause trouble. Light your lamp from the seat.

Tools needed to install: a screwdriver--that's all. We have now 4, 6, 8, 10 and 12 volt lamps in stock for immediate shipment. Renewed bulbs, any voltage up to 12, \$1.25. Complete outfit--1 Bulb, Attachment, 10 foot cable, Snap Switch and directions, \$2.50 (By mail \$2.60).

Double outfits for 2 searchlights or 2 headlights, \$5.00 (By mail \$5.20). Ask any Automobile Supply Store or Garage to get it for you, or we will send it by mail.

The Royal Battery Co., Makers
108-110 Duane Street
NEW YORK CITY

National Sales Corporation
Factory Sales Agents
296 Broadway, NEW YORK CITY

The No. 5 SAXON



THE BEST LOOKING, THE BEST BUILT

LAMP IN AMERICA

We invite Correspondence

Manhattan Lamp Works

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HARRIS OILS

TRADE MARK REGISTERED

A. W. H. Gas Engine Cylinder Oil.

Medium bodied, a suitable oil for the majority of water cooled motors.

Will not carbonize in the cylinder.

Sold at all principal garages.

A. W. Harris Oil Co., 330 S. Water St. Providence, R.I.

THE SWING OF THE PENDULUM

Not only the confirmed imitator at home, who would be copying something else if he were not copying the Rushmore, but the European lamp maker as well, feels strangely drawn Rushmoreward this year. It's a piquant fact that while the American copyist was reproducing the foreign reflector lamp last season, the foreigner was getting ready to copy the Rushmore!



But the RUSHMORE LENS MIRROR is as far from being duplicated as ever, and Rushmore solidity of build is still unique.

HAS CARRIED THE
"CHINESE COPYIST"
TO THE
RUSHMORE
PATTERN
THIS YEAR



THE RUSHMORE DYNAMO WORKS PLAINFIELD, N. J., U. S. A.

The Automobile Trade Directory

IS REFERRED TO CONSTANTLY BY
THE ACTIVE BUYERS IN THIS FIELD

If your advertisement is not appearing in its columns it will pay you to investigate our proposition.

Sure to prove immensely profitable to all who desire to reach the ENTIRE AUTOMOBILE TRADE.

SPECIAL SERVICE

Advertisers are loaned, without additional expense, a complete mailing list of the American retail trade, comprising about 5,000 garages sales-rooms and repair stations, also the leading jobbers in the trade.

This list is absolutely necessary to complete your follow-up system.

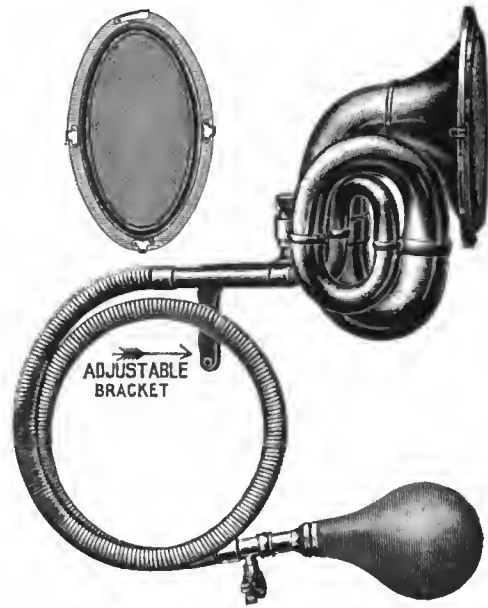
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The Automobile Trade Directory
FLATIRON BUILDING, NEW YORK

THE LARGEST AUTOMOBILE SUPPLY HOUSE IN AMERICA

1907

No. 19 LaBassoon Oval Horn



This is the latest idea in Horns in Europe and we have just received the first lot to arrive in this country. It is the best Horn on the market, is made of heavy spun brass, with triple coil, and produces a deep and lasting tone.

This horn has an oval shape bell and was designed to take up as little space as possible; it is fitted with adjustable bracket and will fit any car. Guaranteed the best value ever offered in auto horns.

PRICE Complete with Forty-inch Flexible Tube, Ten Dollars
We have other styles of 1907 Horns in stock, comprising 20 styles and sizes

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MANUFACTURER, JOBBER, EXPORTER AND IMPORTER
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BRANCHES: Philadelphia, Boston, Cleveland, Detroit, Buffalo

WHAT THEY SAY OF THE

RUSHMORE SHAKING GRATE GENERATOR

(AND THE RUSHMORE SEARCHLIGHT.)

No. 4

THE RUSHMORE DYNAMO WORKS,
Plainfield, N. J.

Gentlemen: You hardly need to write me in the interest of the Rushmore lens for automobiles. I have a 9-inch searchlight on my Winton, and an 8-inch on my Franklin, and one of the new GENERATORS on each car. There is no other lamp comparable with them, and the new GENERATOR deserves all praise. All the same, I should be pleased to receive a catalog.

INDIANAPOLIS, IND.

E. F. HODGES, M.D.

P. S. Mr. Carl Fisher has had the upbringing of this particular automobilist, and while he cannot always have his way with purchasers, in my case he could—and knew it—and would listen to no suggestions as to other lamps but simply insisted that the Rushmore was to all others as gold to copper. He had his way and I am glad of it.

E. F. H.

No. 5

RUSHMORE DYNAMO WORKS,
Plainfield, N. J.

Gentlemen: Enclosed find check for GENERATOR as per your quotation of February 6. While I have had this GENERATOR for some time I have only used it about ten days, and I find it far and away more satisfactory than the one I was, and am still, using on one of the two lights.

GEORGE W. YERKS & CO.

ALBANY, N. Y.

MATHEW VAN ALSTYNE.

No. 6

RUSHMORE DYNAMO WORKS,
Plainfield, N. J.

Dear Sirs Thanks for yours of May 7th. I know just how my "Packard 24" would look with your lamps and GENERATOR, because I have them, and would be content with no others, having used your lamps for the past three seasons. This is the first year for the GENERATOR, which has done very well so far.

OVERBROOK, PA.

CLYDE A. HILLER.

The Rushmore Generator is not a cheap makeshift, but a fully developed automatic device. When handled according to instructions, it gives a perfectly uniform gas supply with none of the annoyances common to the ordinary types of generator. Our catalog describes it in detail.

Rushmore Dynamo Works, Plainfield, N. J.
LONDON PARIS CHICAGO

AN INVALUABLE FEATURE OF "BREECH-BLOCK" PLUGS

IS THE BREECH-BLOCK WHICH ENABLES THE OPERATOR TO OPEN AND CLEAN THE PLUG IN 4 SECONDS



INSTANT REMOVAL AND REPLACEMENT WITHOUT TOOLS.

NO OTHER PLUG IN THE WORLD HAS THESE ADVANTAGES.

Soot-proof to the limit. Unaffected by oil. Chambered end protects porcelain. Keeps porcelain fragments from cylinder. Slightest piston movement cleans points. Makes starting easy; fires first charge. Closely throttled; not a skip. Better value than any other plug made.

This plug is enthusiastically recommended by such experts as Barney Oldfield and thousands of users all over the country.

We guarantee better results with the Breech-block than any plug made. Write for full particulars and prices.

THE STANDARD CO.
TORRINGTON, CONN.

Cleaning Without Scratching



There are plenty of "cleaners" that take off the mud, but all the fine polish comes off with it. The right way to clean the automobile body of mud, dirt, grease and grime and still leave the paint and varnish there—is to use

MOBO

Automobile Cleanser

It is purely a vegetable compound. As smooth as velvet to the touch and won't injure the most sensitive bands. Mobo brings back the lustre to the dullest car, protects the highly polished surface, and prevents blistering and cracking.

Put up in 3-lb. and 6-lb. cans; likewise in tubs, half-barrels and barrels. The following house sells it:

MOTT & SMITH
Far Rockaway, Long Island, N. Y.

and at all good automobile supply stores in all leading cities.

Send for free Mobo booklet—"How to Clean Well Varnish and Paint on an Automobile."

JOHN T. STANLEY
640 W. 30th St., New York

CORNELL GARAGE

PORTABLE

The Solution of the Automobile Garage Problem

The high cost of stabling entirely eliminated by keeping your car in your own garage—a "CORNELL GARAGE"—which is built in style of architecture and color to match your residence, of "CORNELL GARAGE" interchangeable sections. Can be erected by any ordinary help on day of delivery, without nail or screw. Your car is always convenient, safe from unauthorized use and the destructive odors of public garages.

This "ready-made" adequate protection, right at home, within immediate reach, the housing of your car becomes a pleasure instead of an expensive luxury.

Regular styles at moderate prices ready for immediate shipment.

Special designs and specifications submitted and orders executed promptly.

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Portable camps, cottages, play houses, etc.

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HEINZE MOTOR CAR COILS



Selected for
AMERICA'S
REPRESENTATIVE
CHRISTIE'S RACER

in the
GRAND PRIX

FRANCE,
JULY 2d, 1907

The MOST
DEPENDABLE
and
THOROUGHLY
SATISFACTORY
COILS

In the world
HIGHEST EFFICIENCY
LONGEST LIFE

THE FIRST POINT FOR SUCCESS

In motoring is reliable ignition. In racers it is not a question of cost but solely a question of **QUALITY**. The unfailing dependability of "Heinze Coils" makes them absolutely the world's best.

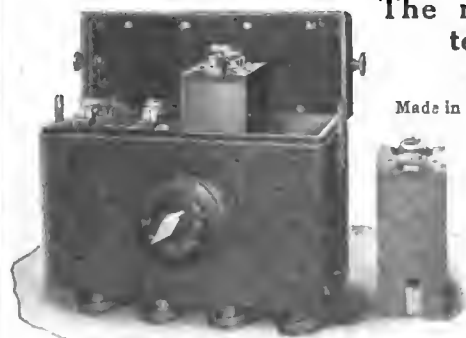
The most reliable under all tests. Always yield splendid results.

Made in Convenient Sizes suitable for any Type of Motor Cars.

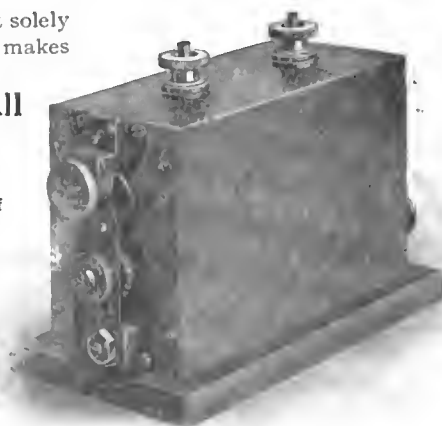
You will make a wise move in specifying Heinze Coils and you will never be disappointed.



Send for Catalogue



Cut of B-35, 4-cyl. Interchangeable Unit Dash Coil



Type B-18, Single Cylinder Vibrating Box Coil

HEINZE ELECTRIC COMPANY, - Lowell, Mass.

"It's nice to know how far you go; and this will show, the speed—also."

Veeder TACHODOMETER

The Scientists' Speed Indicator applied to automobiles. Registers how far—total and for each trip—and shows exact speed at all times from zero to 62 miles per hour.

No springs nor variable elements.

No delicate mechanism.

Only one moving part.

The only speed indicator that can be accurately set to zero at any time by the owner.

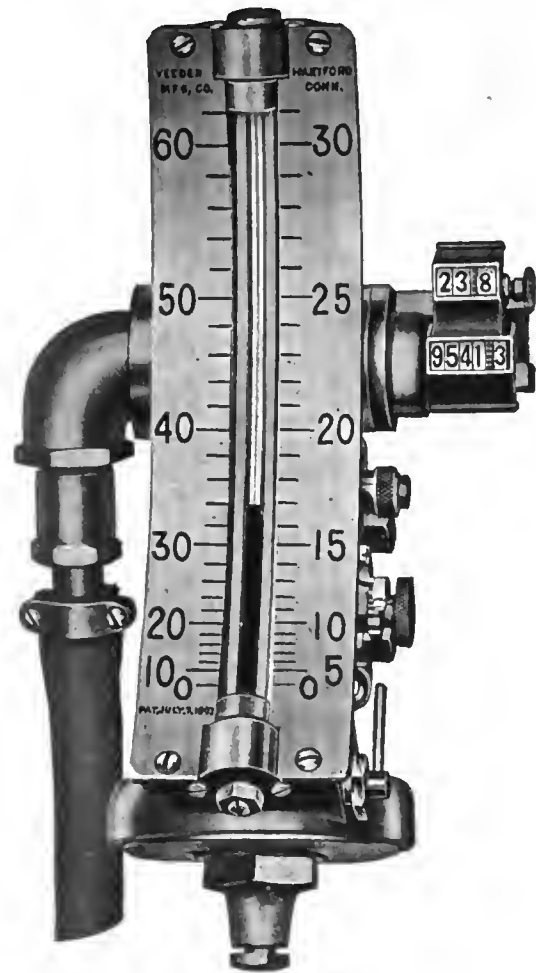
The Veeder Tachodometer, a Tachometer and Odometer combined, is unquestionably the most accurate instrument for indicating speed. Used in the greatest laboratories and shops; time tried, reliable and now fitted for automobile use.

Of the many principles on which speed indicators may be designed, we have chosen the liquid centrifugal, for, having found the means to overcome the early difficulties of using a liquid, the results are so satisfactory and so positively accurate that this system rises superior to all others.

One shaft with paddle wheel permanently attached forms the single moving part, and all operations are based on the natural laws of gravity and centrifugal force. Until these laws change the Veeder Tachodometer must remain permanently accurate.

It is practically impossible to wear it out.

Neither time, use, friction, nor temperature can change its absolutely accurate readings. Any instrument in which springs are employed (and practically all other speed indicators contain springs) vary with age, temperature, and especially with the friction of moving parts, and only by special lubrication, not found in the ones you buy, can correct readings be obtained for even a short time. The Veeder Indicator does not wobble nor swing about, but follows exactly every slightest variation of speed; can be placed



PRICE, COMPLETE, READY TO GO ON ANY CAR. \$75.00

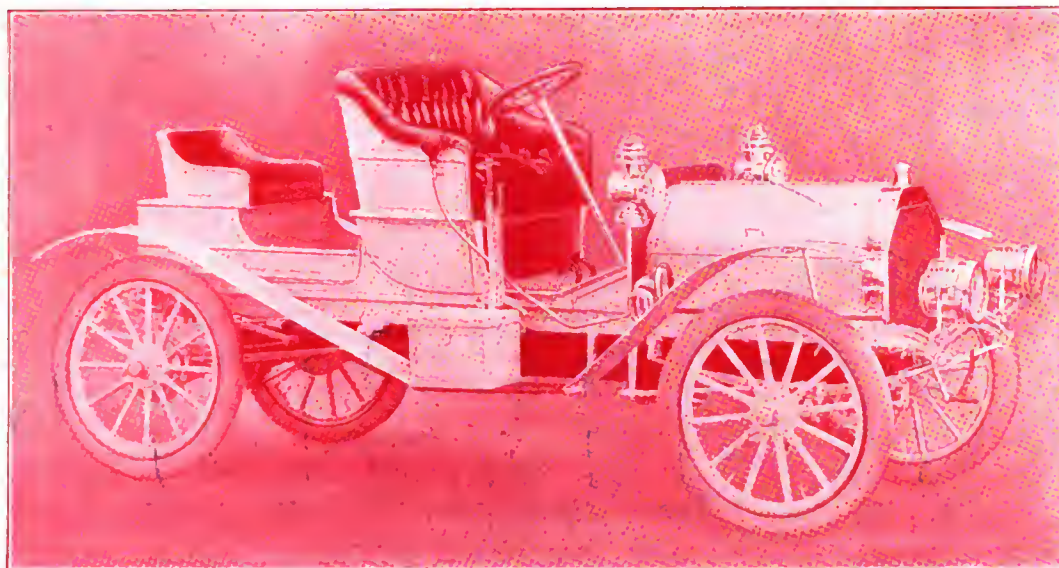
on the dash or in the tonneau or limousine, and is read from a distance at a glance. Supplied with attaching fixtures for all makes of automobiles. In ordering state make and model of car, also year of manufacture.

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Manufacturers of Cyclometers, Odometers, Tachometers, Tachodometers, Counters and Fine Castings.



Made Good—Makes Good

“Made good” in the shop, it has “made good” on the road, and therefore with its owners.

No greater correctness of principle, no better working out of design, no more thoroughness of construction, no finer quality of material, no more simplicity and reliability could be put into a car.

Simple — Strong — Powerful — Reliable

The DRAGON is a car for the owner, not the repair man. It sells easily on talking points that stand up as plain as a post when you look into it. When a prospective customer looks, he generally buys.

Two Models — Touring Car and Roadster — 24-26 h.p.

\$2,000

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RELIABILITY
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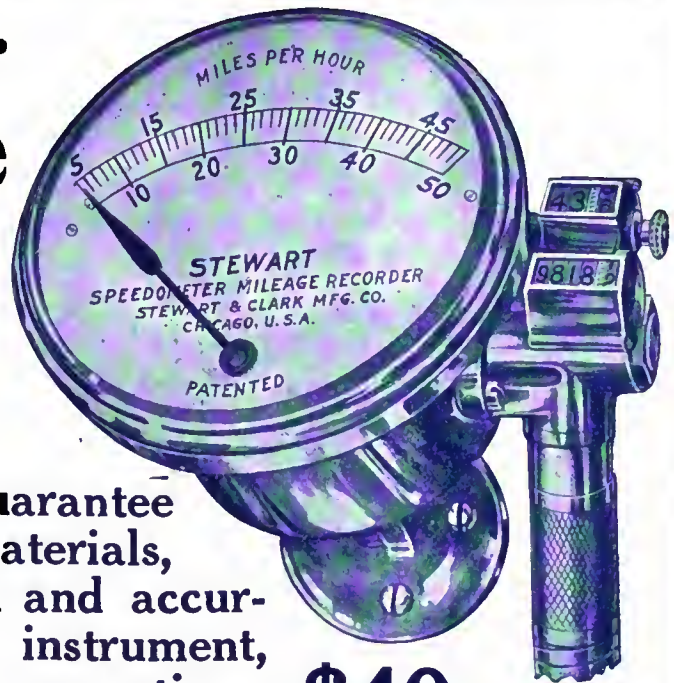
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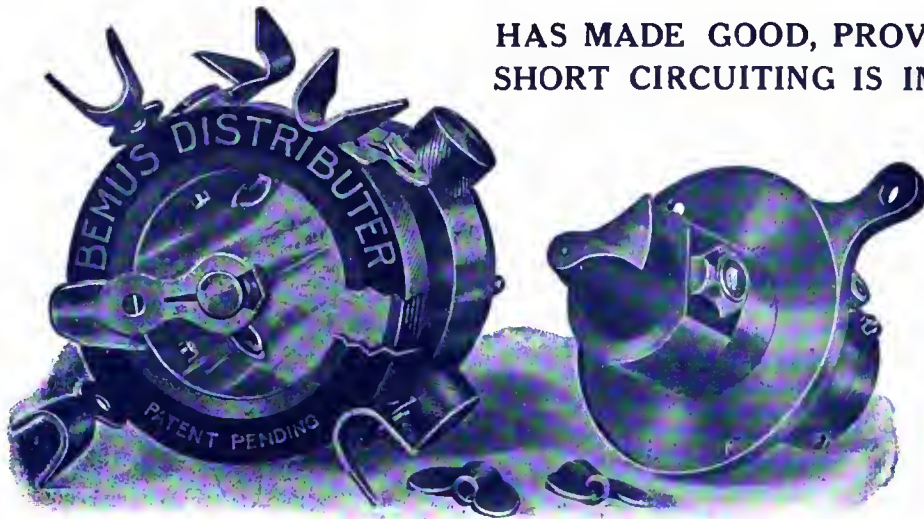
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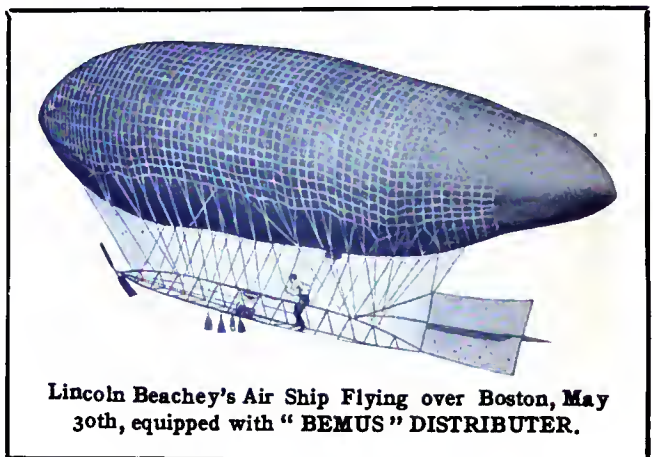
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about vibration is not proof in practice. Swineharts are crowding steadily to the front on honest merit. Cost a little more money but more than five times the mileage of the best pneumatics. Get our booklet "Story from Users." It shows the excellent reputation among users. *Get also Catalog "C."*

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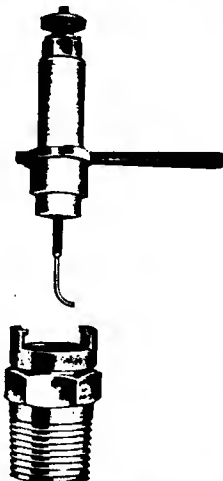
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See that the name "Brown" is stamped on each Plug

Scientifically
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Absolutely
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Carbon prevented
from
Reaching
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It has the most perfect lock ever invented, no working loose after it is locked. It is positive and locks to the maximum pressure with the fingers. Absolutely the most perfect spark plug ever invented.

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Furnished as Regular
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All Royal Batteries are now encased in unbreakable steel enameled jars.

Non-corrosive terminals and trimmings.

New non-corrosive rubber-covered carrying handles.

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1908 is going to be a **ROYAL** year and in order to be in line for prompt deliveries your orders should be placed **NOW**.

Our new pamphlet is in the hands of the printer and we want your name so that we may send you a copy as soon as it is off the press.

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The usual time required to replace a punctured tire is 30 minutes.

With the

CRESCENT

(Formerly Harburg)

Removable Rim

a complete tire change is made in 3 minutes, by the watch.

The above sectional view shows the permanent beveled band, fitted to the wheel felloe, the adjustable rim holding any regular make of clincher tire, and the hinged clip, six of which are used to hold the rim in place.

Extra tires and rims are always carried—the tire being inflated at home before starting on a trip.

When a puncture is experienced, the damaged tire with its rim is removed and the extra rim and inflated tire is quickly bolted to the wheel, the entire operation consuming but three minutes.

Nothing could be more simple. Irritating delays are absolutely done away with. All parts are galvanized, nicked or bronzed, thereby preventing any possibility of their rusting tight.

Any regular make of clincher tires fits these rims. Can be used on old or new wheels.

Write to-day for particulars, prices and descriptive circular.

The Crescent Parts Co.

Dept. A. 1743 Broadway
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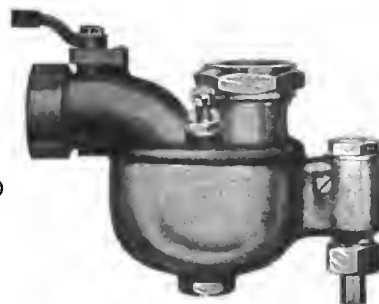
SIMPLICITY

Is the keynote of the Holley 1908 Carburetor and High Tension Magneto

And it is genuine simplicity, too—the kind of simplicity that makes for added efficiency; not the imitation variety, which is gained at the sacrifice of perfect performance.

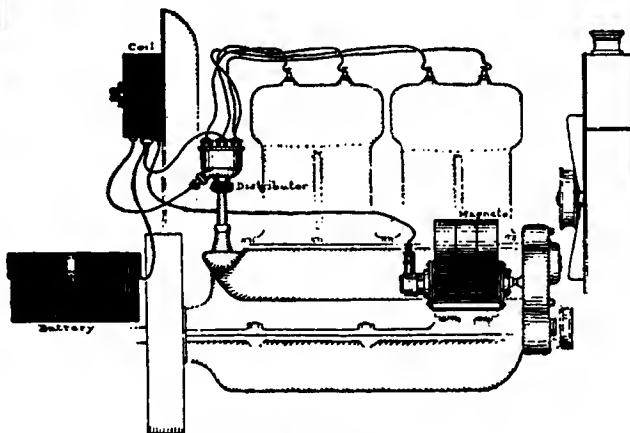
Side Outlet Model

(Top Outlet also furnished)
(Patents Applied For)



THE HOLLEY 1908 CARBURETOR

is unique among its kind—an Automatic Carburetor Without Moving Parts. There are no springs to change their tension, no valves to stick, only one adjustment—that of the needle valve controlling the spray. Automatic action is produced by the shape of the mixing chamber and the arrangement of the spray orifice, and the veriest novice can get as good results as the most expert.



(Patents Applied For)

THE HOLLEY HIGH TENSION MAGNETO

affords a dual ignition system so simple, so adaptable, so "common-sensical" that no owner of a four or six-cylinder car can afford to be without it. It gives two sources of ignition—magneto and battery—entirely independent, yet operating through the same coil, timer, distributor and plugs; and either can be removed in a moment, leaving the other undisturbed to run the car. It gets rid of practically all the additional complication and expense of the ordinary dual ignition systems.

Holley Brothers Company
DETROIT, MICHIGAN



On Your Machine—Not On Your Mind

After all, the tire question, provided it has been wisely disposed of at the outset, is a mere incidental one. It assumes an undue prominence only when this precaution has been omitted. Many good things might be truthfully said about

G & J TIRES

but they are all summed up in this:—that when your machine is equipped with them you can dismiss the tire question for good. In case of accident quick and permanent repairs insure an immediate return to the *status quo*.

The Midgley Universal Rim can be used interchangeably for the Dunlop or clincher type. It's no trick at all to take the tire off when you want to.

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Every tire uniform in construction. All the guess work of unskilled hand labor eliminated. Try one PIRELLI TIRE alongside the old style manufacture and note the difference in wear. The guarantee of one of the oldest and largest rubber manufacturers in the world is behind these tires. Send for price list.



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Throw away your greasy oilskin or hot, heavy rubber garments. Keep dry, clean and comfortable in an outfit of Raino Waterproof Clothing. Raino is a Wonderful Japanese Waterproofing preparation, which becomes a part of the fabric. Raino Clothing is *light, clean, neat, pliable, serviceable*. Made in *Army Olive Drab Color*. Does not *stick, crack, break, gum, rot or peel*. Free from oil, gum, rubber or disagreeable odors.

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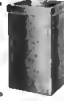
provided you are prepared for it. A good fat purse, and good company, and a good car are fine helps to an enjoyable trip; but if you want to reduce the contents of your purse to its lowest common denominator and cause your friends to admire you as cordially as the Czar admires the Douma, and cause your car to give you an imitation of down-country street car service, just specify tires for your trip that are not made for off-the-boulevard use.

MORGAN & WRIGHT TIRES ARE GOOD TIRES

anywhere, but the users who "root" the loudest for them are the ones who have tested them out on tours of from three to ten thousand miles. We do not claim that every tire will go thru an entire trip without trouble (accidents or careless driving make such a record impossible), but it would surprise some tourists to know what a large percentage of them will do it.



WE MANUFACTURE A FULL LINE OF BATTERY JARS AND ACCESSORIES OF A HIGH QUALITY. SEND SPECIFICATIONS AND GET OUR QUOTATIONS.



The Midgley Universal Rim accommodates either Clincher or Dunlop tires with the same set of beads, besides being as safe as a one-piece rim.

MORGAN & WRIGHT

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49 CARS Entered in the Sealed Bonnet Contest

25 of them were equipped with

Diamond

1907 Wrapped Tread Tires

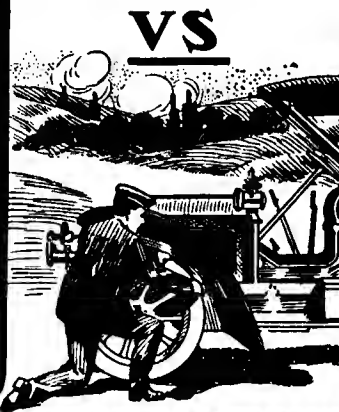
And Nearly All of These Also Used MARSH RIMS

Highest competing tire was used on only eight of the cars and five other makes of tires divided the remainder. Every Diamond tire used was sold at regular prices.

Why have Diamond Tires left all others so far in the rear? Why? Why??

THE DIAMOND RUBBER CO., AKRON, OHIO.

3 MINUTES
to repair a
GOODRICH
Quick Detachable
TIRE



9 MINUTES
to repair
OTHER
MAKES

CENTRAL PENNSYLVANIA AUTOMOBILE COMPANY
GENERAL AGENTS FOR CENTRAL PENNSYLVANIA
 HIGH GRADE CARS, ELECTRIC, GASOLINE AND STEAM

HARRISBURG, PA., MAY 17, 1907.

Gentlemen:—In our recent Endurance Run, pulled off under the most trying circumstances, the roads being notoriously bad, and the weather worse if possible, we had on the White Steamer, Car No. 6, a valuable demonstration of the advantages of the Q. R. Rims. The time required in repairing our first puncture was not measured accurately, but we repaired the second one, and were again in the race, after four minutes. We next found a ten-penny wire nail driven in clear to the head. In this case, we took the tire off, put in a new tube, inflated it with the air pump of the car, in three minutes by the observer's watch, which we believe was "going some" in this line of work. *Our less fortunate competitors were, in many cases, three times that long in doing the same work.* Some cars in this run suffered as many as eight punctures and blow-outs, which accounts for the many bad scores shown on the Official record, and we considered ourselves fortunate in having Goodrich Q. D. tires.

Yours respectfully,

CENTRAL PA. AUTOMOBILING CO.
 I. W. DILL.

I. W. D.—M. M. T.

THE B. F. GOODRICH COMPANY, - Akron, Ohio, U. S. A.



THE TRIDENT RIM

A New Comer

for your approval, takes any Clincher Tire. When using Trident Tires can be easily removed from the rim without deflating tire.

Manufactured in Standard Clincher Rim sizes and profiles.

Commands your attention as being the only Side Ring Detachable Rim made that presents its auxiliary of removing tire without deflating same.

Manufactured exclusively for the Trident Tire Company, New York, by

THE STANDARD WELDING CO.

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Continental TIRES

Sweeping Victory in the Herkomer Race

Once more the Continental Tire captures all the prizes at a great international automobile contest.

The 1907 annual struggle for the Herkomer Trophy was a magnificent race.

Automobiles were entered from practically every country in Europe. The route covered over a thousand miles, and passed through crowded cities, along the highways of the open country, and up and down precipitous and difficult mountain roads. There was a terrific strain on the tires as well as on the cars.

Continental Tires won the first seven positions, a showing never before equaled by any one tire in the history of automobiling.

The Herkomer race simply confirms our repeated statements---that for racing as well as for touring and town usage there is no tire made that can compete with the Continental.



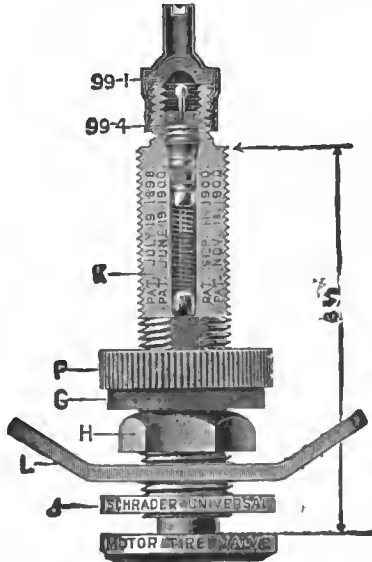
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IS THE BEST CYLINDER OIL
ONE GALLON FREE

I have found that when a person begins to investigate the oil question, he generally arrives at the conclusion that a thick, heavy oil which has a great deal of "body" or density is the oil of merit.

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In Sullivanoil, I have a lubricant that has proven successful on all standard makes of cars.

Sullivanoil of one grade—the proper density—the right "body"—has proven satisfactory in every case.

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I will give you one gallon can of Sullivanoil free—no delivery charges—no obligation whatever on you—to try on your car.

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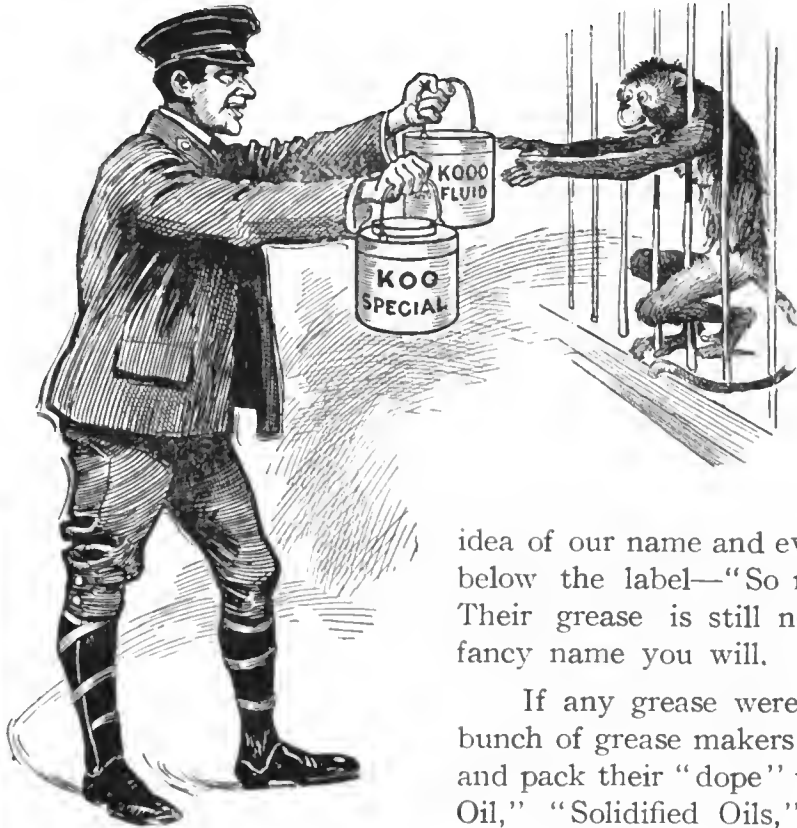


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Reach as hard as he can after the genuine Non-Fluid Oils, the imitator hasn't got any further than the label.

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New York & New Jersey Lubricant Company

Dept. F

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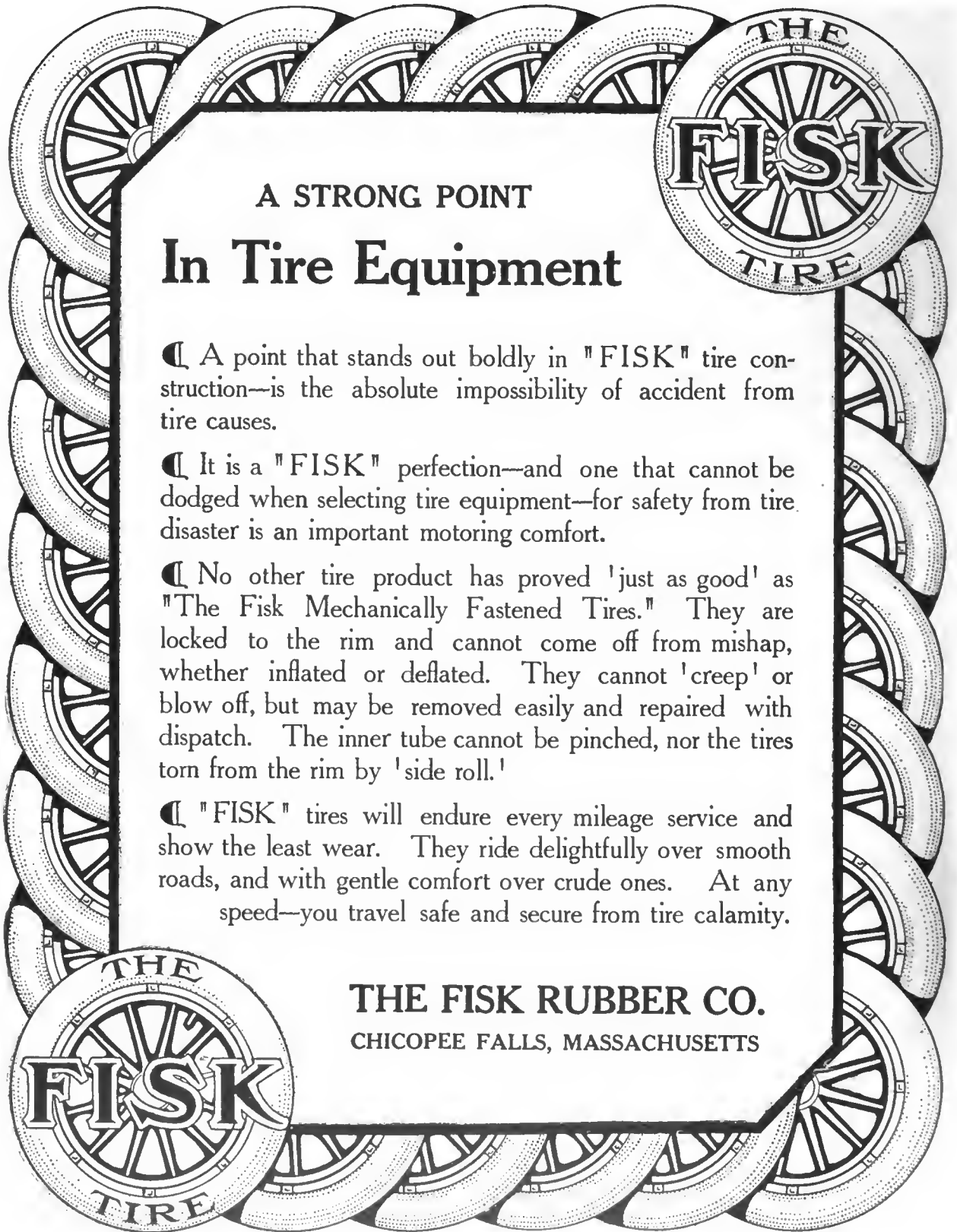
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For Packing Sliding Gear Transmissions. It Cushions the Gears, Prevents Noise and Wear, lasts long and does not leak out.

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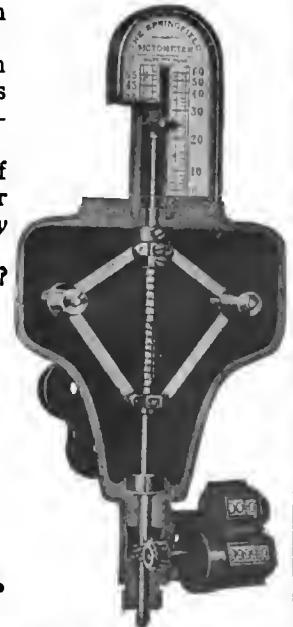
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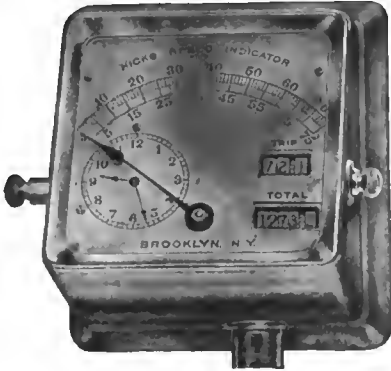
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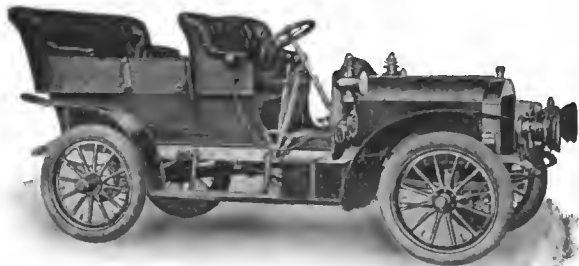


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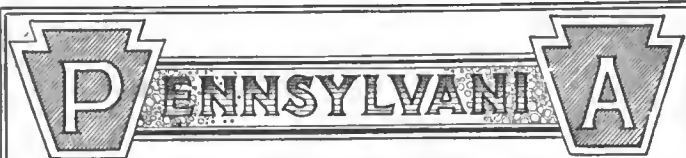
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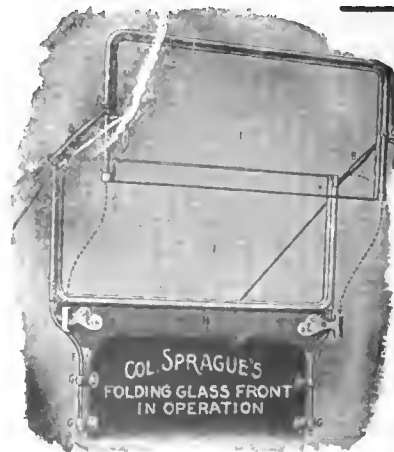
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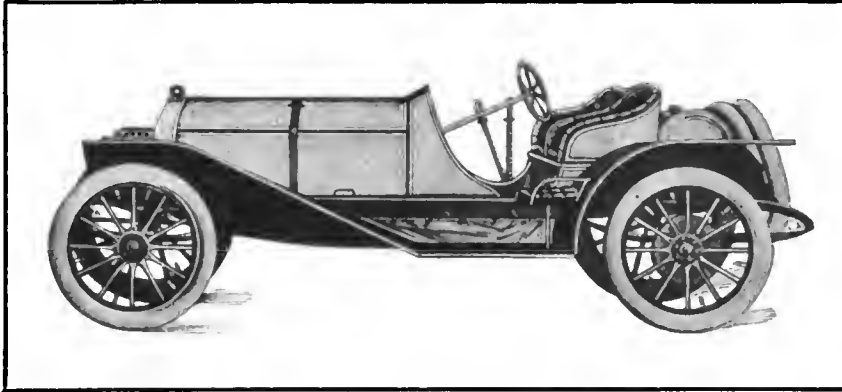
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Weight, 1,800 lbs. "Forty" H.P.
"Mile-a-minute"

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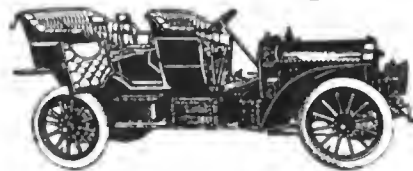
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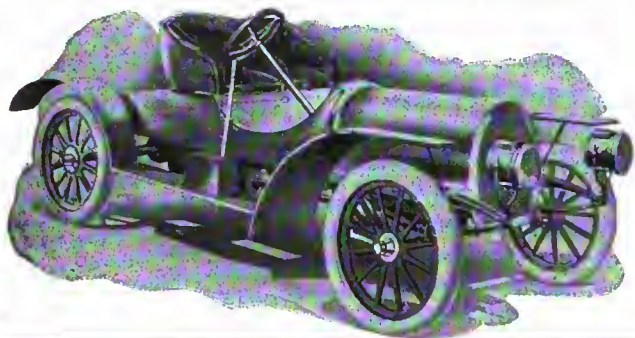
The mechanical construction is as near perfection as is possible to make it. Every pound of weight is eliminated by the use of our system of air cooling, no radiators, pumps or tanks to leak or get out of order. Get our interesting catalog giving full details.

We still have some good territory open. Great chance for reliable agent to make fine income. *WRITE for particulars.*

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\$800
Runabout
\$600



JEWEL argument is not a matter of superlatives nor extravagant, boastful claims. It is based upon these definite points:

There is no other gasoline car that is so easily controlled.

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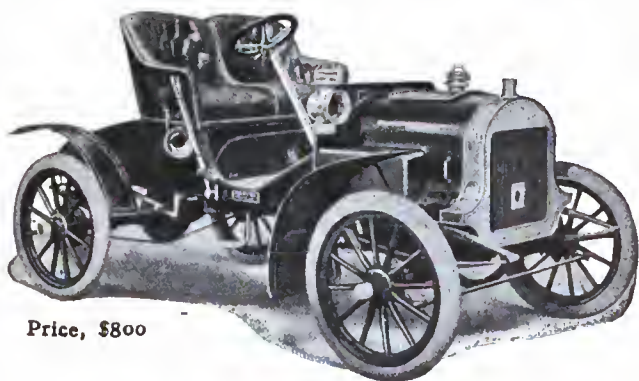
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Price, \$800

The Greatest Value on the Market
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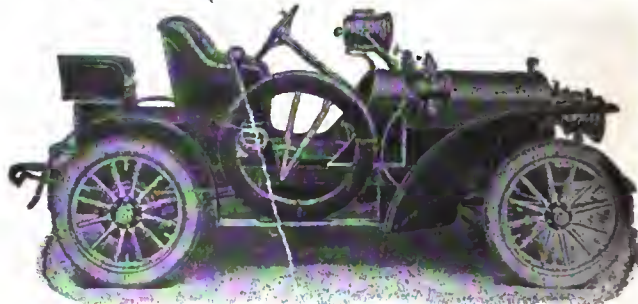
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Other things being equal, you certainly prefer a car which
STARTS WITHOUT CRANKING

The Triumph

SELF STARTING CAR

is the outgrowth of years of experience, and embodies in its construction the three cardinal virtues: **RELIABILITY, DURABILITY, COMFORT**



It is the only car equipped with a Self-Starting Motor, and is so simple that any lady may drive it without the attendance of a chauffeur.

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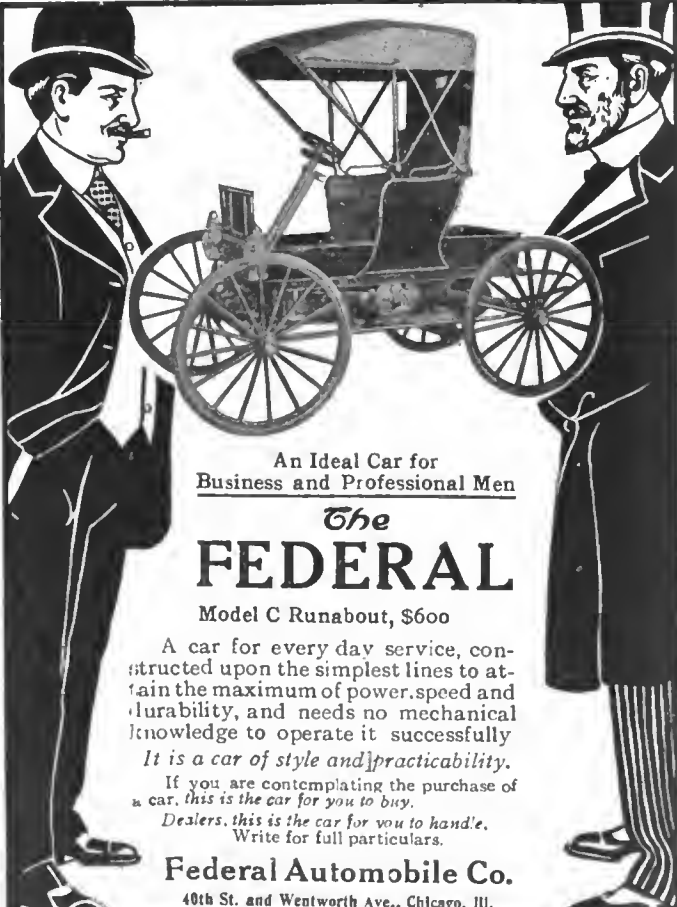
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ONE MODEL FOR ALL
30 Horse Power

Runabout	. . .	\$2500
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It is a car of style and practicability.

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Hundreds of cars in daily use for months. Some have traversed thousands of miles over roughest kind of roads. One made over 8,000 miles. Another 10,000 miles. Not one complaint of tire trouble.

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E. R. THOMAS MOTOR COMPANY

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MODEL G

\$2,000⁰⁰

(Lamps not included)

This is the new Cadillac which has created such a stir in the automobile world, and is the first practical demonstration that it is possible to produce a four-cylinder car at \$2,000 which, for thoroughly high-grade qualities and refinement of detail, as well as for speed and general efficiency, compares favorably with types selling at double



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Material, workmanship and mechanical precision are of the kind that have made Cadillacs famous all over the world.

You cannot afford to buy a multiple-cylinder car, at any price, until you have made a demonstration in the "Model G."

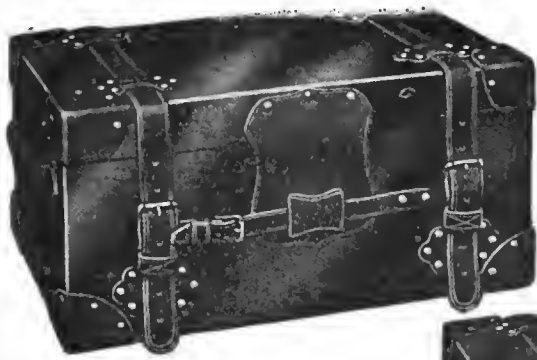
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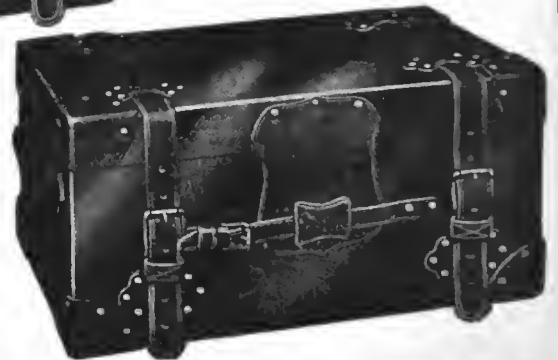
are an ornament to your car as well as providing "all the comforts of home."

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It's the scale of **The Warner Auto-Meter**, actual size. It says your Automobile is traveling 4 miles an hour. It is just as steady on your car as it is in your hand—for the scale of

The Warner Auto-Meter

is not influenced by the jar of the car—speed alone moves it. It doesn't bob around, the way other indicators do, until you are not certain whether it says 5 miles or 15.

Let us tell you more about this wonderful instrument—how it's made with sapphire jewels like a watch, yet is so strongly built that it takes an axe or a bad collision to break it or render it inaccurate, and how we use *magnetism* (in the only practical way), which makes **The Auto-Meter** as reliable as a mariner's compass forever.

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The Auto-Meter is sold by all Dealers and at the best Garages.

Of 62 Contestants in the Glidden Tour, 38 Used The Auto-Meter—Nearly 2/3



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The engine, chassis, and every other vital part of the AMERICAN MORS is an exact duplicate of its famous French licensor.

Built by the largest builders of street cars in the world and backed by this unusual combination of French and American brains, the AMERICAN MORS is conceded to be a triumph of structural solidity and a perfectly balanced car.

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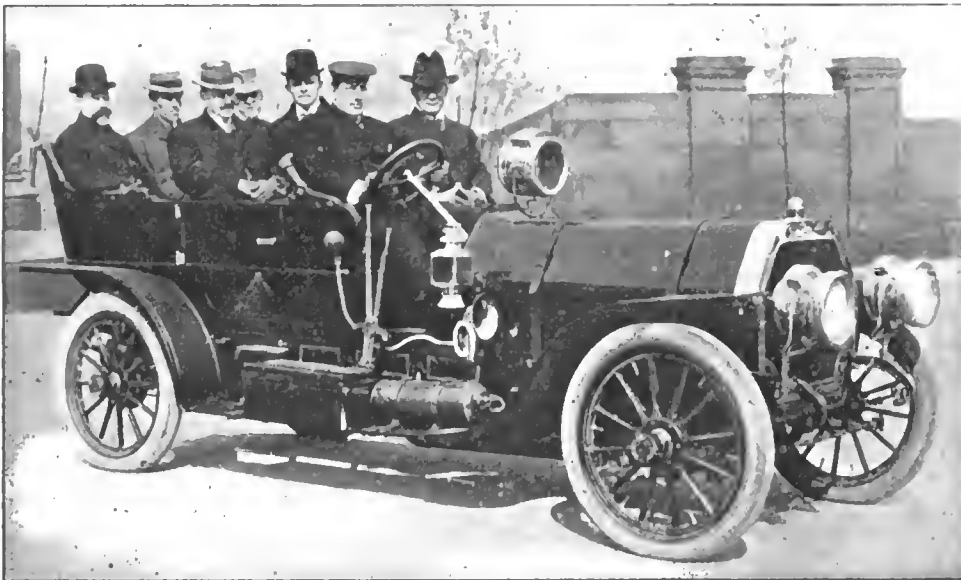
All Bodies of the Most Perfect Designs—Complete Equipment
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4-cylinder
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Member Association Licensed Automobile Manufacturers

The real *Value* of an automobile is in proportion to its *Service* and its *Life*.

By "*Service*" we mean the ability to negotiate all roads—smooth or rough—at the right speed with a full load—the ability to travel one mile or ten thousand miles with assurance of minimum trouble and expense. By "*Life*" we mean not only durability,—resistance to wear,—but that correctness of design which survives changes of fancy—changes of style, because it is *correct*—ahead of the times.

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Two Cylinders, 22 H. P., \$1700
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50 H. P. Four Cylinders
 with self-adjusting air-clutch and
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\$3500

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All prices F. O. B. Factory

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True to its name and motto:

"All that a Motor Car should be."

The first foreign designed car built in America at a moderate price.

THREE MODELS:

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Gentleman's Runabout - 30 H.P.
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Simple, Swift-Running, Powerful, and Correct in Mechanical Construction

1908 contracts now being made. Note the Continental's recent records in the hands of different amateurs:

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- May 7th—Regular equipment, with four persons, Continental established a record between New Haven and Saybrook, Ct., 42 miles, 1 hour, flat, and to Fenwick, Ct. 90 miles and return, in 130 minutes; 7½ gallons gasoline being consumed, officially.
- May 25th—Two races at the Yale Auto Club Meet, 3 miles on half mile track; time, 4:30; second place. Winner, a \$10,500, special De Dietrich; time, 9 seconds better.
- May 30th—Bridgeport Hill Climb, Sport Hill, second place; time, 2:12; touring car class. Free-for-all, stripped; time, 1:52; within 25 seconds of record.
- June 6th—New York Motor Club Endurance Run—200 miles to Albany—started No. 8 and finished No. 11. Clean score, absolutely no adjustment made on the road except on tires.
- June 19-22—The first car to finish with a perfect score in the Sealed Bonnet Contest, 30 minutes ahead of next car at the A. C. A. The Continental will complete 1,000 miles before seals are broken. 850 covered to date.

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Convenience, Comfort and Style



The most stylish, handsome and luxurious carriage in all motordom is

Model 67 Victoria Phaeton

Pope-Waverley

Acknowledged at all automobile shows during the season to be

MECHANICALLY PERFECT

and conspicuous for its beauty of design, trimming, finish and style.

Price, \$1,700

A demonstration in this car will make you a Pope-Waverley enthusiast. We have agents in all principal cities. We make Runabouts, Stanhopes, Surreys, Open and Closed Chelseas, Physicians' Road, Station and Delivery Wagons

Electric Trucks to Specifications.

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MODEL 67 VICTORIA PHAETON.

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THE WINNER A Stearns

In the Cleveland Automobile Club Annual Hill Climb
on Stucky Hill, June 15th

STEARNS stock cars entered six events (all for which they were eligible) and **WON FOUR EVENTS**; were second and third in a fifth event, losing only to a special (almost a freak) racer, and beating an 80 h.p. special racer, former winner of the Vanderbilt Cup; and won third place in a sixth event, losing only to special racing cars, one of international fame.

Stearns Stock Cars beat every other stock car entered of whatever make

Only two Stearns Cars were used — one a stock 6-cylinder, the other a stock 4-cylinder. No other make of car can show such a record. The time was very fast, hill about 18% and 7-10 of a mile long. For details see the news pages.

Coming right on top of the Stearns triumphs at Wilkes-Barre, following the record-making exploits of last year, the White Mountain International Hill Climb, Gates Mills Hill Climb, and other events of national importance, you must admit the absolute superiority of the Stearns, for the proof has been given, as no one else can give it. Remember Stearns never built a racer, and these events were all won with the cars offered for your use.

Isn't it plain that the superior construction of the Stearns makes it a better car than any other for you to buy and use?

Watch for the Stearns Cars with the White Line around the radiator. See how they run. Catalogs and full descriptions free.

Immediate delivery. \$4,500, 30-60 h.p. The easy-running qualities of a "30" in highest perfection — the power of a "60" when needed. The catalog tells how. Write to-day.

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Valveless 2-Cycle

Every Valve Means Trouble and Expense

Price, Three Cylinders, \$1,750
" Four " 2,500

Why couldn't the heavy four-cycle cars win the Los Angeles fifty-mile test? Why couldn't they even equal the remarkable record of the two-cycle Elmore which won the race, averaging only 3 seconds variation per mile during the whole run?

Because the four-cycle cars were four-cycle cars; because, among other things, they had valves—and the two-cycle Elmore didn't.

Because there was loss of power in the four-cycle through intermittent application — there wasn't in the Elmore.

Because—but why more? Why not look up the everyday record of the Elmore as well as in this endurance test?

Our booklet "Our Daily Mail" will help—get it.



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Not One, but Three

The three "full-jeweled" Corbins entered in the Sealed Mechanism Contest (600 miles) of the A. C. A. all finished with perfect scores.

You will find it just the car you want

THE CORBIN MOTOR VEHICLE CORPORATION, New Britain, Connecticut

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CORBIN MOTOR VEHICLE CORPORATION of New York, 1888 Broadway
CORBIN CAR COMPANY of Boston, Motor Mart

The Incomparable WHITE THE CAR FOR SERVICE



WHITE RELIABILITY DEMONSTRATED ON THREE CONTINENTS

In **AMERICA**, perfect scores were made by the two 30 H. P. White Steamers entered in the 600-mile Sealed Bonnet Contest of the Automobile Club of America. Both cars finished in perfect condition and were ready for several more contests of the kind.

In **EUROPE**, a 30 H. P. White Steamer recently completed an 1871-mile non-stop run from London to Glasgow, then over the route of the Scottish Reliability Contest, and back to London. This trip was made under the surveillance of an official observer appointed by the Royal Automobile Club.

In **ASIA**, White Steamers were selected by the Punjab Motor Transport Company, after severe competitive tests in which the leading makes of the world took part. Low cost of up-keep, supreme reliability, and suitability for continuous 'bus service in a mountainous country, where there are practically no repair facilities, were the factors which determined the choice. Ten White cars have just been placed in service by this company.

THE WHITE COMPANY

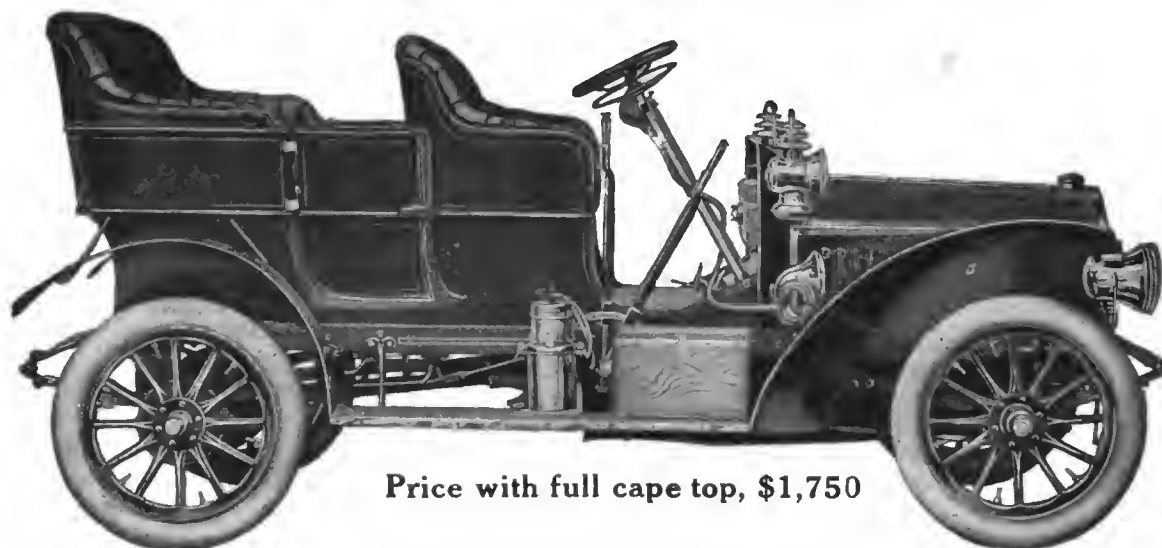
CLEVELAND, OHIO

A R Rambler

MODEL 147

The Greatest Financial Proposition Ever Offered

A strictly high class four-cylinder touring car of medium weight and power at a price that makes an era in the automobile industry



Price with full cape top, \$1,750

SPECIFICATIONS

Motor, 20-25 horsepower; transmission, sliding gear, three forward speeds and reverse, built integral with propeller shaft; rear axle, floating type with roller bearings, wheel-base, 106 inches; wheels, 32 inches with four-inch tires. Equipment comprises full cape top with side curtains and storm apron, 6-volt, 60-ampere storage battery, gas headlights, oil side and tail lights, horn, pump, tools and tire kit.

The quality is up to the Rambler standard in every respect and it is only by means of our enormous factory facilities that we are enabled to offer such a car at the price. The quantity of this Model will be limited and an early investigation is advised. Write for circular 147. It is at your service.

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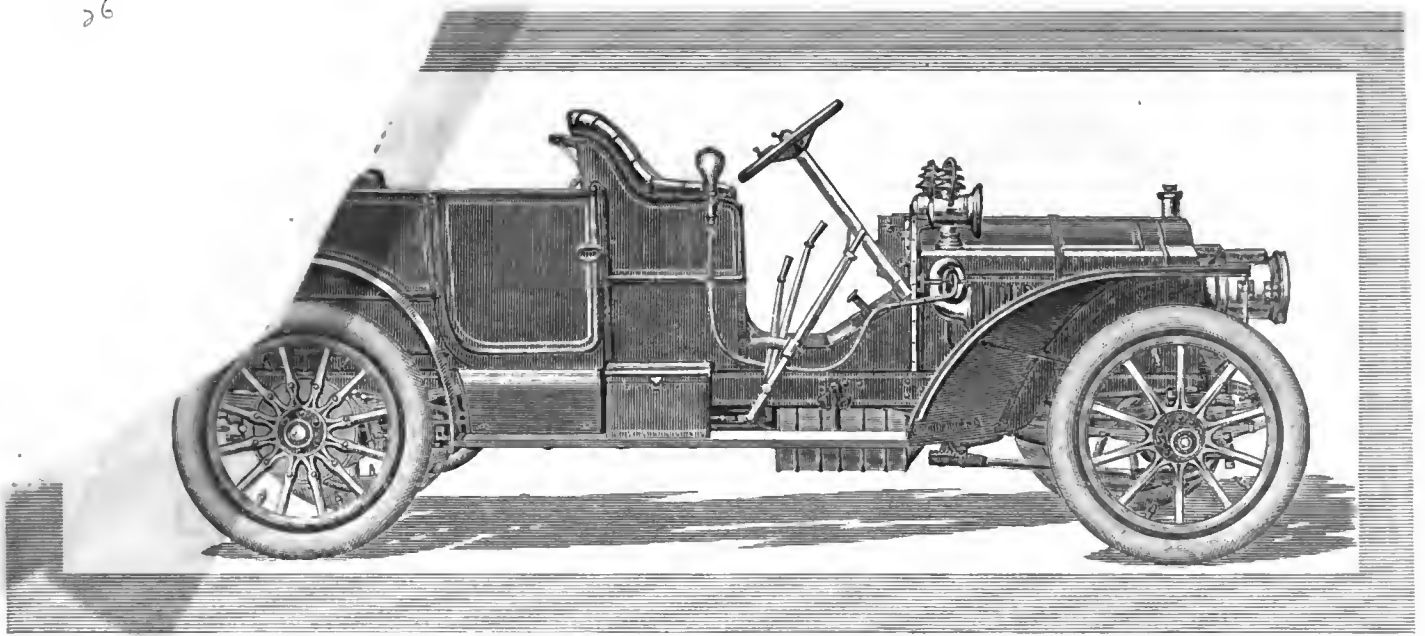
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Packard

"THIRTY"
1908

FOR the season of 1908, the Packard Motor Car Company continues its time-tried policy of devoting its great factory to the production of motor cars of one model—a new Packard “Thirty.” In its most notable form this is a touring car, and also is furnished as a runabout, limousine and landaulet, or equipped with cape cart or Victoria top. Capable, modish in design and luxurious in appointment, the car is a Packard throughout, with improved detail and refined construction. The price of the touring car, in standard finish and equipment, is \$4,200, f. o. b. Detroit.

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Detroit, Michigan

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